

**PRESCRIPTION OF BENZODIAZEPINES BY PRIMARY HEALTH CARE
DOCTORS: CHARACTERISTICS OF PRESCRIBING TREND AND
IMPLEMENTATION OF AN ONLINE PROGRAM**

TERESA ALVES DOS REIS

A thesis submitted in partial fulfilment of the requirements for the Doctoral Degree
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Table of Contents

<u>TABLE OF CONTENTS.....</u>	<u>I</u>
<u>LIST OF FIGURES</u>	<u>III</u>
<u>LIST OF TABLES</u>	<u>V</u>
<u>ACRONYMS AND ABBREVIATIONS</u>	<u>VII</u>
<u>UNDERLYING SCIENTIFIC WORK.....</u>	<u>IX</u>
<u>PREFACE</u>	<u>XI</u>
<u>ACKNOWLEDGEMENTS</u>	<u>XV</u>
<u>ABSTRACT</u>	<u>XVII</u>
<u>RESUMO</u>	<u>XXI</u>
<u>1. INTRODUCTION TO PROBLEM DEFINITION, INTERVENTION DESIGN AND IMPLEMENTATION.....</u>	<u>1</u>
1.1. EXCESSIVE BENZODIAZEPINE (BZD) UTILIZATION AND STUDY SETTING DEFINITION 1	
1.2. THE PORTUGUESE BZD PRESCRIBING AND UTILIZATION CONTEXT	9
1.3. MEDICALIZATION AND PSYCHOPHARMACEUTICALIZATION	14
1.4. RESEARCH CONCERNING REASONS FOR SUSTAINED HIGH BZD PRESCRIPTION TRENDS AND BARRIERS TO CHANGING THE EXCESSIVE PRESCRIPTION OF BZDs.....	18
1.5. BEHAVIOUR CHANGE AND IMPLEMENTATION SCIENCE	22
<u>2. RESEARCH AIMS AND OBJECTIVES</u>	<u>41</u>
<u>3. DEVELOPING A CONTINUING MEDICAL EDUCATION ONLINE PROGRAM TO CHANGE BENZODIAZEPINE PRESCRIPTION PATTERN</u>	<u>47</u>

USING THE BEHAVIOUR CHANGING WHEEL (BCW) THEORY TO DESIGN AN INTERVENTION TO CHANGE BZDs PRESCRIPTION PATTERN.....	47
<u>4. IMPLEMENTING AN ONLINE PROGRAM TO CHANGE BENZODIAZEPINE PRESCRIPTION PATTERN</u>	<u>61</u>
4.1. MANUSCRIPT 1: IMPLEMENTING AN ONLINE PROGRAM TO CHANGE BENZODIAZEPINE PRESCRIPTION: PROTOCOL OF A HYBRID TYPE 1 CLUSTER RANDOMIZED TRIAL	61
4.2. MANUSCRIPT 2: IMPLEMENTING AN ONLINE PROGRAM TO CHANGE BENZODIAZEPINE PRESCRIPTION IN PORTUGAL: A CLUSTER RANDOMIZED TRIAL.....	81
4.3. OTHER RELEVANT RESULTS COMING FROM THE EFFECTIVENESS CLUSTER-RANDOMIZED TRIAL.....	105
<u>5. BARRIERS AND FACILITATORS FOR IMPLEMENTING AN ONLINE PROGRAM TO CHANGE BENZODIAZEPINE PRESCRIPTION.....</u>	<u>121</u>
5.1. BARRIERS AND FACILITATORS FOR IMPLEMENTING AN ONLINE PROGRAM TO CHANGE BENZODIAZEPINE PRESCRIPTION – IN DEPTH ANALYSIS OF DIFFERENT DATA SOURCES	121
5.2. MANUSCRIPT 3: BARRIERS AND FACILITATORS FOR IMPLEMENTING A CONTINUING MEDICAL EDUCATION INTERVENTION IN A PRIMARY HEALTH CARE SETTING	197
5.3. MANUSCRIPT 4: BARRIERS AND FACILITATORS TO CHANGING BENZODIAZEPINE PRESCRIPTION PATTERNS IN PORTUGAL: A MIXED-METHODS STUDY WITH GENERAL PRACTITIONERS.....	223
<u>6. GENERAL PRACTITIONERS' PERSPECTIVES OVER SOLUTIONS TO CHANGE BZD PRESCRIPTION TRENDS.....</u>	<u>241</u>
6.1. MANUSCRIPT 5: GENERAL PRACTITIONERS' PERSPECTIVES OVER SOLUTIONS TO CHANGE BZD PRESCRIPTION TRENDS – A QUALITATIVE STUDY IN PORTUGAL	241
<u>7. CONCLUSIONS.....</u>	<u>257</u>

List of Figures

FIGURE 1. MODES OF DELIVERY FOR INTERVENTION FUNCTIONS.	29
FIGURE 2. DISTRIBUTION OF PARTICIPANTS AFTER RANDOMIZATION.	67
FIGURE 3. FLOWCHART OF GPs INCLUDED IN DATA ANALYSIS.	89
FIGURE 4. FLOW OF GPs COMPLIANT TO INTERVENTION.	90
FIGURE 5. PRESCRIPTION PROPORTION OF BZDs AT INTERVENTION AND CONTROL UNITS DISTRIBUTED BY TYPE OF PRIMARY HEALTH CARE UNIT.	92
FIGURE 6. BZD PRESCRIPTION TO PATIENTS OVER 65 YEARS OLD COMPARED WITH BZD PRESCRIPTION TO PATIENTS UNDER 65 YEARS OLD.	93
FIGURE 7. PRESCRIPTION PROPORTION BY ACTIVE PHARMACEUTICAL INGREDIENTS	94
FIGURE 8. PROPORTION OF ANTIDEPRESSANT PRESCRIPTION BY TYPE OF PRIMARY HEALTH CARE UNIT. ...	109
FIGURE 9. ANTIDEPRESSANT PRESCRIPTION PROPORTION BY ACTIVE PHARMACEUTICAL INGREDIENTS.	111
FIGURE 10. ANTIDEPRESSANT PRESCRIPTION PROPORTION BY ACTIVE PHARMACEUTICAL INGREDIENT TO PATIENTS OVER 65 YEARS OLD.	112
FIGURE 11. ANTIDEPRESSANT PRESCRIPTION PROPORTION BY ACTIVE PHARMACEUTICAL INGREDIENT TO FEMALE PATIENTS.	113
FIGURE 12. FLOW OF PARTICIPANTS IN PART 5.	122
FIGURE 13. FLOW OF RESPONDENTS TO BAFAL.	138
FIGURE 14. THEMES EMERGING REGARDING CHANGING BZD PRESCRIPTION.	149
FIGURE 15. THEMES EMERGING REGARDING BARRIERS AND FACILITATORS OF DBCI IMPLEMENTATION. .	166

List of Tables

TABLE 1. SUMMARY OF PUBLICATIONS HIGHLIGHTING THE EXCESSIVE PRESCRIPTION AND UTILIZATION OF BZDs IN PORTUGAL.	9
TABLE 2. THE NINE INTERVENTION FUNCTIONS.	26
TABLE 3. EXAMPLES OF THE MOST FREQUENTLY USED BCTs FOR THE NINE INTERVENTION FUNCTIONS. ..	28
TABLE 4. SUMMARY OF AIMS AND RESEARCH OUTPUTS PRODUCED AT EACH WORK PACKAGE.	43
TABLE 5. SELECTED TARGET BEHAVIOURS INCLUDED IN THE INTERVENTION.	50
TABLE 6. ANALYSIS OF THE COM-B COMPONENTS APPLIED TO THE INTERVENTION.	51
TABLE 7. SELECTED INTERVENTION FUNCTIONS APPLIED TO THE INTERVENTION.	52
TABLE 8. SELECTED BCTs APPLIED TO THE INTERVENTION.	53
TABLE 9. COSTS FOR THE NHS WITH BZD CO-PAYMENT.	96
TABLE 10. CHARACTERISTICS OF PATIENTS WITH ANTIDEPRESSANT PRESCRIPTION.	108
TABLE 11. ANTIDEPRESSANT PRESCRIPTION BY TYPE OF PRIMARY HEALTH CARE UNIT.	109
TABLE 12. ANTIDEPRESSANT PRESCRIPTION FREQUENCY BY ACTIVE PHARMACEUTICAL INGREDIENTS.	110
TABLE 13. DIAGNOSIS CODED AT THE SAME MONTH AS ANTIDEPRESSANT PRESCRIPTION.	114
TABLE 14. CHARACTERISTICS OF ONSITE QUESTIONNAIRE RESPONDERS.	124
TABLE 15. RESULTS FOR ONSITE MULTIPLE ANSWER QUESTIONS.	125
TABLE 16. CHARACTERISTICS OF BAFAI RESPONDERS.	138
TABLE 17. BARRIERS AND FACILITATORS TO EDUCATIONAL ONLINE PLATFORM (EPRIMAPRESCRIBE).	140
TABLE 18. DISTRIBUTION OF PARTICIPANTS BY SELECTION CRITERIA.	147
TABLE 19. DISTRIBUTION OF CHARACTERISTIC OF INTERVIEW RESPONDERS.	148
TABLE 20. RESULTS FROM THE ONSITE QUESTIONNAIRE MULTIPLE ANSWER QUESTIONS.	205
TABLE 21. RESULTS OF THE BAFAI.	213
TABLE 22. RESULTS FROM THE ONSITE SURVEY MULTIPLE ANSWER QUESTIONS.	231
TABLE 23. GPs SOCIODEMOGRAPHIC CHARACTERISTICS.	245
TABLE 24. DESCRIPTION OF THEMES FOR SUGGESTED SOLUTIONS.	246

Acronyms and abbreviations

B

BFAI Barriers and Facilitators Assessment Instrument

BZD(s) Benzodiazepines

C

CME Continuing Medical Education

D

DBCI Digital Behaviour Change Intervention

G

GP(s) General Practitioners (used in the same sense as primary health care doctors and family doctors or family physicians)

I

INFARMED Portuguese National Authority of Medicines and Health Products

N

NHS Portuguese National Health Service

S

SPMS Serviços Partilhados do Ministério da Saúde (traduzido por Shared Services of the Portuguese Ministry of Health)

U

UCSP Personalized care unit model (type of organizational model for primary health care units in Portugal)

USF Family health unit model (type of organizational model for primary health care units in Portugal)

Underlying scientific work

Teresa Reis. *Changes in prescribing patterns of benzodiazepines after training of General Practitioners.*

XI Congresso Nacional de Psiquiatria – Psiquiatria e Medicina- Ligações e Disjunções.
November 2015, Vilamoura, Portugal.

Teresa Reis. *Changes in prescribing patterns of benzodiazepines after training of General Practitioners,*

24th European Congress of Psychiatry. 2016, Madrid, Spain.

Teresa Reis. *Benzodiazepines: when to start, how and when to stop - we are all responsible.*

Commemorations of the Mental Health Week, 10th to 14th October 2016, Beja, Portugal.

Manuscript 1: *Implementing an online program to change benzodiazepine prescription: protocol of a hybrid type 1 cluster randomized trial*

Co-authors: **Teresa Reis,** Comprehensive Health Research Centre (CHRC), Nova Medical School, Lisbon, Portugal; Helena Serra, Interdisciplinary Centre of Social Sciences (CICS.NOVA), NOVA School of Social Sciences and Humanities, Universidade NOVA de Lisboa, Lisbon, Portugal; Sofia Azeredo, Comprehensive Health Research Centre (CHRC), NOVA Medical School, Universidade Nova de Lisboa, Lisboa, Portugal; EpiDoC Unit, CEDOC, NOVA Medical School, Universidade Nova de Lisboa, Lisbon, Portugal; Miguel Xavier, Comprehensive Health Research Centre, Mental Health Department, NOVA Medical School – UNL, Lisbon, Portugal

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Manuscript 2: *Implementing an online educational program to change benzodiazepine prescription in Portugal: a cluster randomized trial*

Co-authors: **Teresa Reis,** Comprehensive Health Research Centre (CHRC), Nova Medical School, Lisbon, Portugal; Helena Serra, Interdisciplinary Centre of Social Sciences (CICS.NOVA), NOVA School of Social Sciences and Humanities, Universidade NOVA de Lisboa, Lisbon, Portugal; Sofia Azeredo, Comprehensive Health Research Centre (CHRC), NOVA Medical School, Universidade Nova de Lisboa, Lisboa, Portugal; EpiDoC Unit, CEDOC, NOVA Medical School, Universidade Nova de Lisboa, Lisbon, Portugal; Miguel Xavier, Comprehensive Health Research Centre, Mental Health Department, NOVA Medical School – Universidade Nova de Lisboa, Lisbon, Portugal

Manuscript status: submitted for publication.

Manuscript 3: *Barriers and facilitators for implementing a Continuing Medical Education intervention in a primary health care setting*

Co-authors: **Teresa Reis**, Comprehensive Health Research Centre (CHRC), NOVA Medical School, Universidade NOVA de Lisboa, Lisbon, Portugal; Inês Faria, Research Centre in Economic and Organizational Sociology, Lisbon School of Economics and Management, University of Lisbon (CSG-SOCIUS/ISEG, U.Lisboa); Helena Serra, Interdisciplinary Centre of Social Sciences (CICS.NOVA), NOVA School of Social Sciences and Humanities, Universidade NOVA de Lisboa, Lisbon, Portugal; Miguel Xavier, Comprehensive Health Research Centre, Mental Health Department, NOVA Medical School, Universidade NOVA de Lisboa, Lisbon, Portugal

Manuscript status: submitted for publication.

Manuscript 4: *Barriers and facilitators to changing benzodiazepine prescription patterns in Portugal: a mixed-methods study with general practitioners*

Co-authors: **Teresa Reis**, Comprehensive Health Research Centre (CHRC), NOVA Medical School, Universidade NOVA de Lisboa, Lisbon, Portugal; Inês Faria, Research Centre in Economic and Organizational Sociology, Lisbon School of Economics and Management, University of Lisbon (CSG-SOCIUS/ISEG, U.Lisboa); Helena Serra, Interdisciplinary Centre of Social Sciences (CICS.NOVA), NOVA School of Social Sciences and Humanities, Universidade NOVA de Lisboa, Lisbon, Portugal; Miguel Xavier, Comprehensive Health Research Centre, Mental Health Department, NOVA Medical School, Universidade NOVA de Lisboa, Lisbon, Portugal

Manuscript status: submitted for publication.

Manuscript 5: *General Practitioners' perspectives over solutions to change BZD prescription trends – a qualitative study in Portugal*

Co-authors: **Teresa Reis**, Comprehensive Health Research Centre (CHRC), NOVA Medical School, Universidade NOVA de Lisboa, Lisbon, Portugal; Inês Faria, Research Centre in Economic and Organizational Sociology, Lisbon School of Economics and Management, University of Lisbon (CSG-SOCIUS/ISEG, U.Lisboa); Helena Serra, Interdisciplinary Centre of Social Sciences (CICS.NOVA), NOVA School of Social Sciences and Humanities, Universidade NOVA de Lisboa, Lisbon, Portugal; Miguel Xavier, Comprehensive Health Research Centre, Mental Health Department, NOVA Medical School, Universidade NOVA de Lisboa, Lisbon, Portugal

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Preface

This preface is written with the purpose of helping the reader to context the content of this thesis, to explain the path that led to the achievement of this work, and also a way of informally getting the reader to know more about me.

The path to a PhD

I have always been interested in studying, researching, and knowing more about my subjects of interest. This was the main reason why, just after finishing my medical school degree and starting my clinical career in a general hospital, with a more rural setting and without a clear connection to academia, I decided I had to pursue my passion for clinical research by applying to a master. This was how I ended doing my double Master in Clinical Research at Nova Medical School and Master of Science in Regulatory Affairs for Drugs, Biologics, and Medical Devices by NorthEastern University, Boston, Massachusetts. After finishing this master, and at a point where my interest in mental health policy was growing, I decided to start a master in Mental Health Policy and Services at Nova Medical School. Despite the interest in this area, I considered that there was no sense in doing another master thesis, hence, after completing the curricular year of this master, I applied for this PhD program.

Choosing a subject

My master's in clinical research thesis concerned the excessive prescription of benzodiazepines in Portugal. Despite considering that the work I developed in this master thesis raised important issues, I felt that many questions were left to answer. At the same time, I thought it made sense to develop an intervention whose design was carefully prepared and implemented in my geographical area of intervention – Alentejo, and that eventually could have a positive impact in the public health concerning issue of excessive BZD prescription.

Setbacks and difficulties

A series of difficulties and challenges marked my PhD journey.

The first, and probably the most demanding, was that I completed the PhD during my psychiatry residency and early motherhood. This was a personal and conscious choice,

closely related to the fact that I wanted to keep studying, learning, and having a continuous relationship with the faculty and academia. Still, the direct consequence was taking much more time to complete the PhD program, than I initially expected.

The second, and indeed the one that had the more significant impact on my results, was the access to prescribing data. The Shared Services of the Portuguese Ministry of Health (SPMS), as a central service, and single responsible for collecting prescription (and diagnosis registration) in Portugal, would be the ideal sponsor for developing monitoring programs and research using these data. However, this Service is not research-focused at all. The bureaucracy of getting through authorizations, besides other non-identifiable or understandable difficulties, delayed the process for two years (between the first granted authorization and data availability). Also, the final database's version was not coincident with the detail that was initially granted, which resulted in analysis being only possible at a much more aggregated cluster level. This very important setback determined in some way the results, since much more detailed analysis were needed to allow for studying the impact of the proposed intervention (as further detailed in section 4).

The third and final setback concerned the begging of the Covid pandemic. The qualitative work, detailed in sections 5 and 6, was conveyed initially to happen as onsite in-depth interviews and had to be turned into telephone interviews. Despite this setback, I consider that the interviews' content was very rich and insightful of the questions they were addressing, and some GPs even referred (because the interviews were performed in early April 2020), that at that time they were more available to a deepen reflection over the subject than they used to be because some services were closed to in-person appointments.

Thesis structure

I decided to present this thesis using a structure by papers. Notwithstanding, I included a section (section 5.1.) with an in-depth analysis of the materials concerning the implementation trial, mainly dedicated to analysing the qualitative materials, to guarantee that I had the opportunity to present the full richness of the collected data.

Closure of a journey (that in fact is just the beginning)

My PhD journey was, for me, a continuous learning exercise. It stimulated my search for new knowledge, even in the hardest and demanding moments of my personal life. It allowed me to learn how to perform research more autonomously. It allowed me to learn about

qualitative methodology in a way that I would probably never feel complied with if not integrated into this process. For this reason, I do not feel that this PhD program, and the direct result of it, this PhD thesis, is a closure in itself, but just another step in my knowledge acquisition path.

Acknowledgements

First and foremost, I would like to thank my advisors Professor Miguel Xavier and Professor Helena Serra. Thank you for all the support and encouragement you gave me during these years. Without your guidance and feedback, this PhD would not have been achievable. Thank you for believing in me and for all your patience. Your advice on both research and my career has been invaluable.

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Many thanks to Dr. José Góis – as I said many times before, “more than teaching me how to fly, you gave me wigs”. Thank you for encouraging me and letting me be much more than just a psychiatry intern.

To all primary health care units’ coordinators in Alentejo central region for facilitating the study implementation, and to all the GPs who willingly participated in the study, especially to the ones that participated in the in-depth interviews and openly shared their perspectives.

To Maria Ana Matias and Joana Zózimo – your help and suggestions were crucial to “unblock” difficult crisis moments, thus, to make this thesis happen.

I am grateful to my family, who has provided me with moral, financial, and emotional support. To my mother, who was always there for me and always believed that I could make it. To my father, who at some point was the only reason that kept me going. To my beloved sister, who has always supported me along the way, who is my inspiration and life model. To my husband that always supported me, even when that meant cleaning my tears and keeping with my bad humor. To my daughters, Rosarinho e Margarida – you made this task the harder it could get, but I hope you can see this achievement as inspirational one day. To Ms. Teresa Cid, whose help and support to my children and home were crucial to allow me the time and peace of mind to dedicate to this task.

I gratefully acknowledge the funding received towards my PhD from Fundação Eugénio de Almeida through the Academic Excellence Scholarship 2016-2017 (Bolsa de Excelência Académica 2016-2017).

I dedicate this thesis to people with mental health problems. It might seem too general (and even a long shot considering the thesis title), but I honestly hope that this thesis contributes to a reflection about how mental health is managed in Portuguese primary health care settings.

Abstract

Introduction

The excessive prescription of Benzodiazepines (BZDs) is a global concern. Specifically in Portugal, the consistently high prescription of BZDs has been referenced in national and international publications over the last 20 years, with this fact being recognized as a sign of inadequate management of mental disorders and considered a serious public health concern.

General Practitioners (GPs) are responsible for the majority of prescriptions and renewals of BZDs, hence changing prescription' pattern in the primary health care setting should be a priority.

BZDs prescription has been reported as a complex behaviour influenced by GPs' values, beliefs, attitudes and experiences, as well as patients' characteristics and demands.

A large number of interventions using different methodologies have been implemented to change BZDs prescription' pattern in primary health care settings. Most of these interventions do not have a significant impact and often the effect is lost after a short period.

Continuing medical education (CME), defined as any and all ways through which doctors learn after the formal completion of their training, is a systematic attempt to facilitate change in physicians' practices. Efforts have been made to promote physicians' participation in CME, assuming that if they are up-to-date, they will change and improve their practice, resulting in better performance and ultimately better patient care. However, studies continue to demonstrate considerable gaps between the real and ideal performance and patient outcomes. In recent years, there has been an exponential growth in the potential of e-health CME interventions. There are some benefits to an e-learning approach to educational materials: content can be easily updated, it can be provided to meet individual learning needs, and can be delivered at any time and in any place, depending on the technology used. An increasing number and variety of CME e-learning opportunities are now available for primary healthcare, considering that in these setting interventions with a lower demand on professional time and limited budget are particularly interesting.

Digital Behaviour Change Interventions (DBCIs) are behaviour change interventions that involve computer technology or digital encoding of information. This specific type of behaviour change intervention has a particular potential for its successful application to CME

interventions in primary health care settings, given its low unit-cost, high reach, and its effective and acceptable ways of benefitting individuals and society.

The general aim of this thesis is to evaluate the effectiveness, feasibility, and the implementing process of a DBCI platform, called ePrimaPrescribe, to change BZDs prescription patterns in primary health care settings. Specific objectives were to study the impact of the online platform on the BZDs and antidepressant prescription' patterns, to detail the diagnosis more frequently associated with BZDs prescription; to discuss the barriers and facilitators to the implementation of online CME interventions; to discuss the barriers and facilitators to change the BZDs prescription pattern; and finally, to allow for an in-depth reflection on solutions suggest by GPs to change BZDs prescription patterns.

Methods

The thesis follows an effectiveness-implementation hybrid design.

The work detailing the effectiveness research contains two studies. The first describes the protocol, with a more in-depth description of the design and preparation process, and the second the implementation using a two-arm cluster-randomised clinical trial.

The work detailing the implementation research is presented in three studies. The first two studies use a mixed methodology. These studies explore the barriers and facilitators of the implementation process using quantitative data coming from two questionnaires and qualitative data coming from in-depth interviews. A third study focuses on solutions pointed by GPs to change BZDs prescription pattern and uses a qualitative thematic analysis.

Results

The study detailing the effectiveness process showed that BZDs were more frequently prescribed to older people and women. In most analysis we did not find any significant change in BZDs prescription' pattern. Regarding secondary outcomes, depressive disorder was the first and anxiety disorder most frequently registered diagnosis associated with BZDs prescription. BZDs' co-payment represented an average expenditure of approximately 1300€ per health unit per month.

The studies focusing on the implementation process found that: concerning the barriers and facilitators to implementing online CME interventions, GPs reported as the main barriers to

CME a lack of time, a perception of work overload, a lack of digital competence, a lack of digital infrastructure, as well as motivational and emotional factors. They reported as facilitators, to CME delivered through the DBCI ePrimaPrescribe: the convenience of the delivery method, the practical and pragmatic characteristics of the content, the liaison with specialists, and the possibility for CME to be mandatory. Concerning the barriers and facilitators to changing BZDs prescription patterns, GPs identified as the main barriers: knowledge and training in mental health, time, perceived high frequency of mental health disorders, patients, shared prescription responsibility, social environment, lack of non-pharmaceutical interventions, limited infrastructural resources and GPs' burnout. Communication and support from psychiatry specialists was the only facilitator that GPs perceived as being a significant factor. The final study found that solutions proposed by GPs focused on organizational aspects, such as human resources, infrastructure and training (including on BZDs withdrawal schemes), alternative non-pharmacological approaches, and wider community-based initiatives to counter societal aspects affecting mental health in the identified region

Conclusions

The effectiveness study shows that changing a prescribing behaviour is complex and might have many influencing factors.

The perceptions of the barriers and facilitators reported by GPs represent an important contribution to improving knowledge regarding the factors influencing the implementation of CME in primary health care settings. In addition, this approach shed light on the factors that more significantly influence the change in BZDs prescription pattern. Finally, the solutions suggested by the GPs reflect what they consider to be context specific needs. These bottom-up perspectives should be taken into account when proposing new policies and local strategies to tackle current excessive BZDs prescription, especially considering the failure of previous strategies to change this well-known public health issue.

Resumo

Introdução

A prescrição excessiva de Benzodiazepinas (BZDs) é uma preocupação mundial. Especificamente em Portugal, a prescrição consistentemente elevada de BZDs tem sido referenciada em publicações nacionais e internacionais ao longo dos últimos 20 anos, sendo este facto reconhecido como sinal de gestão inadequada das perturbações mentais e considerado um grave problema de saúde pública.

Os médicos de Medicina Geral e Familiar (MGFs) são responsáveis pela maioria das prescrições e renovações de BZDs, portanto, mudar o padrão de prescrição no contexto dos cuidados de saúde primários deve ser uma prioridade.

A prescrição de BZDs tem sido reconhecida como um comportamento complexo influenciado pelos valores, crenças, atitudes e experiências dos MGFs, bem como pelas características e demandas dos pacientes.

Um grande número de intervenções, recorrendo a diferentes metodologias, tem sido implementado para mudar o padrão de prescrição de BZDs no contexto dos cuidados de saúde primários. A maioria dessas intervenções não tem um impacto significativo e muitas vezes o efeito é perdido após um curto período.

A Educação Médica Contínua (EMC), definida como toda e qualquer metodologia formativa recebida pelos médicos, após a conclusão formal da sua formação, é uma tentativa sistemática de facilitar a mudança nas práticas dos médicos. Têm sido implementados esforços para promover a participação dos médicos na EMC, assumindo que se se mantiverem atualizados, haverá uma melhoria e mudança da sua prática, resultando num melhor desempenho e, em última análise, gestão e resposta ao paciente. No entanto, os estudos continuam a demonstrar lacunas consideráveis entre o desempenho real e ideal e os resultados dos pacientes. Nos últimos anos, houve um crescimento exponencial no potencial das intervenções de EMC online. Existem alguns benefícios numa abordagem de e-learning para a implementação de EMC: o conteúdo pode ser facilmente atualizado, pode ser ajustado para responder às necessidades individuais de aprendizagem e pode ser disponibilizado a qualquer hora e em qualquer lugar, dependendo da tecnologia utilizada.

Intervenções de Mudança de Comportamento Digital são intervenções de mudança de comportamento que envolvem tecnologia de informação ou codificação digital de informações. Esse tipo específico de intervenção para a mudança de comportamento tem um potencial particular para uma aplicação bem-sucedida em intervenções de EMC no contexto dos cuidados de saúde primária, dado o seu baixo custo unitário, possibilidade de elevado e fácil alcance e distribuição, e pela sua eficácia e aceitabilidade.

O objetivo geral desta tese é avaliar a eficácia, viabilidade e o processo de implementação de uma plataforma de intervenção de mudança de comportamento digital, chamada ePrimaPrescribe, para alterar os padrões de prescrição de BZDs no contexto dos cuidados de saúde primários. Os objetivos específicos foram estudar o impacto da plataforma online nos padrões de prescrição de BZDs e antidepressivos, explorar qual o diagnóstico mais frequentemente associado à prescrição de BZDs; discutir as barreiras e facilitadores para a implementação de intervenções de EMC online; discutir as barreiras e facilitadores para mudar o padrão de prescrição de BZDs; e, finalmente, permitir uma reflexão aprofundada sobre as soluções sugeridas pelos MGFs para alterar os padrões de prescrição de BZDs.

Métodos

A tese segue uma metodologia híbrida de efetividade-implementação.

O estudo que investiga a efetividade da intervenção contém dois manuscritos. O primeiro descreve o protocolo, com uma descrição mais aprofundada do processo de desenho e preparação da intervenção, e o segundo manuscrito descreve a efetividade através de um ensaio clínico aleatorizado com recrutamento por grupos (clusters).

O estudo de investigação do processo de implementação é apresentado em três manuscritos. Os dois primeiros estudos utilizam uma metodologia mista. Esses estudos exploram as barreiras e facilitadores do processo de implementação usando dados quantitativos provenientes de dois questionários e dados qualitativos provenientes de entrevistas em profundidade. O terceiro estudo trata as soluções apontadas pelos MGFs para mudar o padrão de prescrição de BZDs e utiliza uma análise temática qualitativa.

Resultados

O estudo que detalha o processo de efetividade mostrou que as BZDs foram prescritas com maior frequência a idosos e mulheres. Na maioria das análises não foi encontrada nenhuma mudança significativa no padrão de prescrição de BZDs. Em relação aos objetivos secundários, a perturbação depressiva foi o diagnóstico mais frequente e a perturbação de ansiedade o segundo diagnóstico mais frequentemente associado à prescrição de BZDs. A comparticipação das BZDs representou uma despesa média de aproximadamente 1.300€ por unidade de saúde por mês.

Os manuscritos dedicados ao processo de implementação demonstraram que, em relação às barreiras e facilitadores para a implementação de intervenções de EMC online, os MGFs relataram como principais barreiras à EMC a falta de tempo, a perceção de sobrecarga de trabalho, a falta de competência digital, a falta de infraestrutura digital, bem como fatores motivacionais e emocionais. Relataram como facilitadores da implementação de EMC online: a conveniência do método, as características práticas e pragmáticas do conteúdo, a articulação com especialistas e a possibilidade da EMC ser obrigatória. Em relação às barreiras e facilitadores para a alteração dos padrões de prescrição de BZDs, os MGFs identificaram como principais barreiras: conhecimento e formação em saúde mental, tempo, a perceção de uma elevada frequência de problemáticas de saúde mental, os pacientes, a responsabilidade de prescrição partilhada com outros médicos, o ambiente social, a falta de intervenções não farmacológicas, os recursos de infraestrutura limitados, e o “*burnout*” dos MGFs. Apontaram como único facilitador a comunicação e apoio de especialistas em psiquiatria. O manuscrito final demonstrou que as soluções propostas pelos MGFs se concentravam em aspetos organizacionais, como recursos humanos, infraestrutura e formação, abordagens alternativas não farmacológicas e iniciativas comunitárias mais amplas para combater os aspetos sociais que afetam a saúde mental na região identificada.

Conclusões

O estudo de efetividade mostra que mudar um comportamento de prescrição é complexo e pode ter muitos fatores de influência.

A perceção das barreiras e facilitadores relatados pelos MGFs representa uma importante contribuição para melhorar o conhecimento sobre os fatores que influenciam a implementação de EMC no contexto dos cuidados de saúde primários, bem como acerca

dos fatores que influenciam mais significativamente a alteração do padrão de prescrição de BZDs. Finalmente, as soluções sugeridas pelos MGFs refletem o que eles consideram necessidades específicas do contexto. Estas perspectivas “*bottom-up*” deverão ser consideradas quando se propuserem novas políticas e estratégias locais para enfrentar a atual prescrição excessiva de BZDs, especialmente tendo em conta o fracasso de estratégias anteriores para mudar este reconhecido problema de saúde pública..

**Introduction to problem definition,
intervention design and implementation**

1. Introduction to problem definition, intervention design and implementation

1.1. Excessive benzodiazepine (BZD) utilization and study setting definition

Benzodiazepines (hereafter referred to as BZDs) are the most utilized anxiolytic and hypnotic drugs. The main effects of BZDs are reduced anxiety, sedation, and induction of sleep, reduction of muscle tone, an anticonvulsant effect, and anterograde amnesia (1). BZDs, due to their fast acting effect, are often chosen to treat anxiety disorder, at the expense of the adequate pharmacological treatment with antidepressants (2,3). The unwanted effects of BZDs can be divided into toxic effects resulting from acute overdosage, unwanted effects occurring during routine therapeutic use, tolerance, and dependence (1,4). The side effects of their use are daytime drowsiness, slowness of movements and thought, dizziness, cognitive impairment, impaired coordination, and dependence (5).

The high consumption of BZD has been the target of recent studies that underscore the burden and consequences of routine therapeutic use that often, and easily, become chronic and excessive (6). The continuous utilization of BZDs has been strongly associated with an increased number of falls and bone fractures (7–9), a higher number of road accidents (8,10), and has a possible role in inducing the phenomenon of suicide (11–13). Although with a weaker evidence, BZDs use has also been related to cognitive decline and dementia (14–16) and increased mortality risk (17,18).

The excessive prescription of BZDs is a global concern. In Spain, a study analysing BZDs consumption trends between 2006 and 2015 demonstrated that BZDs consumption increased over this period and that changes in prescription trends did not coincide with the financial crisis, the introduction of prescriptions by active ingredient, electronic prescriptions, or co-payment (19). In France, a study of the trends in the use of BZDs from 2006 to 2012, highlighted a limited decrease in the incidence of BZD use, which was considered insufficient concerning the level of exposure to these drugs in the country (20). In Ireland, BZD prescription significantly increased between 2005-2015. A study showed that BZDs prescribing was common in this population, with a high proportions of individuals receiving long-term prescriptions (21). In England, a study collecting data in

2014-2015, indicated that more than a quarter of a million people were likely to be taking dependency-forming BZD medication far beyond the recommended usage of 2-4 weeks (22). In Germany, a study that collected data between 2010 and 2014 showed that long-term use of BZDs was common in older people, particularly in patients over the age of 80 and those diagnosed with dementia, sleep disorders, or depression (23). In Australia, a longitudinal study with a population-based design, allowing for observation of the same individuals across two decades, showed an increase in anxiolytic and sedative use, with the prevalence of medication use increasing with advancing age (24). In Korea, a study examining trends in the prescription of BZDs for the elderly (age over 65 years) between 2009-2013, demonstrated an annual prevalence of over 35% (25). In the USA, a study assessing trends in continuing and new prescriptions for sedative-hypnotic medications between 2005 and 2012 showed increasing prescribing in recent years, attributable to long-term growth in continuing prescriptions, rather than new prescriptions. Furthermore, the study showed that continued prescribing of BZDs to the very old (i.e., 81 years and older) were as prevalent, if not more so, than continued prescribing to younger age groups (26). Two other pieces of research in the USA confirmed the substantial and growing outpatient use of BZDs (27,28). In September 2020, the US Food and Drug Administration (FDA) announced an anticipated update to the boxed warning on all BZDs to explicitly “address the serious risks of abuse, addiction, physical dependence, and withdrawal reactions” among this class of drug. In addition to the revised boxed warning, the FDA also modified its detailed prescribing information. The new prescribing information advises physicians to warn patients of the risks of BZDs; to assess patients’ risk of abuse, misuse, and addiction; to use caution when co-prescribing BZDs with opioids; to seek the lowest effective dose for the shortest treatment duration possible and to taper off BZDs slowly; consider alternate therapies; and to follow up with patients who are frequently prescribed BZDs frequently (29).

Compared with other European OECD countries, in 2011, Portugal had not only the highest utilization of BZDs (anxiolytics, hypnotics, and sedatives drugs), but also the highest increase in utilization. In a more detailed analysis, considering only countries with a similar 12-month prevalence for mental disorders, with parallel results for negative mental health in the SF-36 questionnaire (30), and with similar standardized death rates for suicide (31), Portugal was still the country with the highest BZD utilization (32). According to official national literature and the OECD database, BZDs use in Portugal increased from 35 Defined Daily Doses per 1000/inhabitants (DHD) in late 1980s to over 90 DHD in 2012 (33–37). Anxiolytics,

hypnotics and sedatives, of which the most used and prescribed drugs are BZDs, showed a 6% increase since 2000.

In 2010, the continuing excessive prescription was highlighted as a severe public health issue in need of urgent action (38). The most recent data published by the Portuguese National Authority of Medicines and Health Products (INFARMED) reports that anxiolytics, sedatives, and hypnotics were the fourth most used therapeutic class in 2019 (39).

Regarding BZDs misuse in populations where its use should be particularly restricted, a study aiming to characterize BZDs use in an older population in a specific region of Portugal showed that the prevalence of BZDs use in a non-institutionalized older population over the age of 75 was 37.9%. This points to a higher prevalence when compared to the results of the majority of international studies carried out in similar populations. BZDs were mainly used by women, and more frequently used by patients over the age of 85 years (43.2%) in comparison with patients in the 75 to 84 years group (35.4%) (37).

General Practitioners (GPs) are responsible for the majority of BZD prescriptions, and carry an even higher responsibility for renewing these prescriptions. One study points for 66.9% of all BZD prescriptions; in contrast, psychiatrists accounted for 16% and other specialists for 14.8%. GPs renewed prescriptions in 94.3% of cases, while psychiatrists and other specialists renewed prescriptions at a rate of only 4.5% and 1.2%, respectively (40). Another study found that GPs prescribe 55% of all BZDs and 90% of all chronic BZDs for older adults (41). These data support the relevance of choosing interventions to change BZDs prescription patterns in the primary health care settings.

Interventions to change prescription trends

As outlined above, the problem of BZDs over-prescription has long and extensively been recognized. We shortly reviewed evidence from interventions aimed at changing BZD prescription trends, particularly studies implemented in primary health care settings. We chose to categorize interventions by general attributes and design, adapted from a proposal by Smith in a 2010 non-systematic review (42): educational interventions, audit and feedback interventions, alert interventions, and policy/organizational interventions.

Educational interventions

Educational interventions can be sub-categorized into minimal interventions and systematic discontinuation interventions targeting doctors.

Minimal interventions

Minimal interventions use strategies such as advising patients in the form of a letter.

Research using this methodology shows a significant impact on BZDs prescription patterns, with a dose reduction from 22-30% (43–46). These studies suggest that the impact comes from the minimal intervention itself, since when an invitation to visit a GP for a consultation focused on discontinuing BZDs was added to sending a letter to patients, no significant difference was found compared to those who received only the letter (43–45).

Doctor-patient communication is enhanced by implementing minimal interventions and engaging patients in the discontinuation processes (47,48). This was demonstrated by a study where two-thirds of patients who received an information leaflet prior to consultation discussed the use of BZDs and/or sedative-hypnotics with their health provider, resulting in a subsequent plan to taper off over half of the patients (47). Another study with the minimal intervention of sending an eight-page patient empowerment booklet by email showed a similar effect (at six months, 27% of the intervention group had discontinued BZDs use). A six-month telephone follow-up interview with all participants in the intervention group who completed the trial (n = 123) revealed that 62% had initiated discussions about BZD therapy discontinuation with their physician and/or pharmacist, and 58% had attempted discontinuation (49).

This evidence suggests that minimal intervention might have advantages compared to more time and cost-intensive interventions (42).

Systematic discontinuation interventions targeting doctors

Many interventions of this type have been tried to encourage physicians to reduce the number of BZDs they prescribe, avoid long-term prescriptions to naïve patients (which had never had a prescription before), and reduce and discontinue prescription to patients already with a dependence problem (50). Educational outreach visits can be effective in improving practice, and these are more significantly effective in changing prescription patterns if a trained person performs personal visits to health professionals (51). When trying to change how healthcare professionals prescribe medications, outreach visits consistently provide small changes in prescribing, which might be potentially significant when hundreds of patients are affected (51).

A 2010 non-systematic review showed that educational interventions targeted at GPs significantly decreased BZDs use (42). The same study indicated that education for long-term care staff about alternative methods to treat insomnia and anxiety, and thus cutting back on the use of BZDs, would enhance the intervention's success. Another study, with a peer-led small group education methodology, showed results in changing prescribing practices. In this study, however, these changes, though they were sustained for at least 9–24 months, waned in time (52). A study implemented in 2014, that compared a structured intervention with follow-up visits, showed that a structured intervention with written instructions and usual care, demonstrated a significant effect on discontinuing BZDs use (53), and this effect was maintained at 36 months; however, there was no difference between the types of intervention compared (54).

Audit and feedback interventions

Audit and feedback intervention rely on having practice performance evaluated and then compared, usually after an intervention, with other participants. This type of intervention has shown only a small or no effect when implemented as a single intervention (55,56), but it is of significance when associated with educational programs (57).

Policy/organizational interventions

The functional, payment, and organizational characteristics of primary health care influence patients' perceptions of the quality of the service and drug prescription patterns, especially for BZDs (58). Notwithstanding, political measures without a more direct provider engagement have failed or have only had minimal impact on changing prescription patterns, as illustrated by the following examples.

Since January 2009, BZDs are no longer reimbursed when used as an anxiolytic, hypnotic, or sedative in the Netherlands. Coverage remained in the case of epilepsy, palliative sedation, and multiple psychiatric disorders, under the condition that the physician considered no alternative treatments to be suitable. This measure led to a short-term moderate decrease in BZDs use in patients with newly diagnosed anxiety or sleeping disorders in general practice (59) and a long-term effect in the case of incidental users. This measure, however, represented no savings in terms of reimbursement for the Dutch Ministry of Health; in fact, the absolute number of reimbursed prescriptions increased annually from 3,350 million in 2009 to 5,033 million in 2017. One of the reasons for these data pointed to by report's authors was that prescribers could declare that a patient had multiple psychiatric disorders, even if this was not true, in order to keep the drug reimbursed (60).

In France, a pay-for-performance intervention between the Federation of French GPs and the French Ministry of Health was implemented in 2011 to motivate GPs to improve their practices. However, the proportion of patients who continued BZDs utilization did not decrease. In 2015, the French Ministry of Health decided to decrease the reimbursement of BZDs from 65% to 15%, but this measure did not reduce the long-term consumption of BZDs (61).

In Australia, a policy measure to reduce alprazolam (a type of BZD) misuse, issued in February 2017, delisted the 2-mg tablet strength from its public subsidy, eliminated refills, and reduced the pack size from 50 tablets to 10 tablets. A study was performed to describe the subsequent changes in alprazolam dispensing, prescribing, and poisonings associated with the implementation of this new policy (62). The study found that after the policy intervention, subsidized alprazolam use did decrease, but the increase in prescribing approvals placed additional burden on prescribers. Furthermore, even after the intervention, most people who were prescribed alprazolam were still receiving the treatment contrary to best-practice recommendations. Furthermore, the Poison Information Centre data suggested

that people were still being dispensed the 2-mg tablet strength, presumably as non-subsidized (i.e., private) prescriptions.

The heterogeneity of the abovementioned studies and interventions are probably significantly related to each country's reality, particularly to the organizational and governance characteristics of their primary health care settings. An illustrative example is an intervention implemented in Portuguese Primary Health Care, aimed at comparing the effectiveness of educational outreach visits and the usual dissemination of clinical guidelines (63). Although most educational outreach interventions have shown a significant impact on prescription trends, in this study, no short, medium, or long-term effects were observed, and no differences in drug costs were found between the intervention and control groups.

The Optimise Suicide Prevention Programs Europe study (OSPI-Europe) (64), implemented in Portugal in 2013, had a work package to evaluate the program's impact on the prescription of BZDs and antidepressants (65). The results demonstrated a significant increase in antidepressants prescription and a significant decrease in BZDs prescription after a single eight hours, face-to-face intervention. The main limitations of the OSPI-Europe study were the lack of staff to implement the face-to-face intervention to a higher number of GPs and the loss of intervention effect ten months after the intervention. This study also pointed to the existence of factors influencing the prescription trends, such as the prescriber's and patient's sex, the prescriber's clinical experience and the patients' age. Recent literature further hypothesizes that internalized societal biases and stereotypes affect BZD prescribing behaviour. In a research by McIntyre (66), published in 2020, male prescribers were more likely to prescribe BZDs to female patients than to male patients. This gender bias in prescription was significant and considered worthy of careful attention at the point of care.

Tailored intervention strategies are frequently recommended to implement improvements in health professional performance. Attempts to change health professionals' behaviour may be impeded by a variety of different barriers, obstacles, or factors (which can be collectively referred to as determinants of practice). Change may be more likely if implementation strategies are specifically chosen to address these determinants (67).

Interventions to improve the quality of care need to be evidence-based. They should not be widely adopted until controlled studies demonstrate that they are safe and more effective than usual care (68). With this in mind, one cannot deny the importance of rigorously testing innovative single interventions that might add relevant discussion to the much-needed

evolution of knowledge in this field. It also has to be recognized that interventions to change prescription behaviour can probably never be generalized to every type of prescription in any type of setting.

A maximally effective withdrawal strategy, at minimal cost and with a low need for professional time, is especially important in primary healthcare settings because of budgetary limitations and the small amount of GP time available per consultation (69).

In recent years there has been an exponential growth in the potential of e-health interventions, particularly in terms of prescribing. E-learning approaches have shown a similar effect on outcomes, such as learners' knowledge and satisfaction, compared to traditional approaches such as face-to-face teaching (70,71). There are some benefits to e-learning approaches to educational materials: educational content can be easily updated, can be provided to meet individual learning needs, and can be delivered at anytime and anywhere, depending on the technology used (70,72). There is an increasing number and variety of e-learning opportunities available for primary healthcare education, but the potential benefits of e-learning will only be realized if the barriers are considered. At the same time, the importance of the influence of the national context in which the program is used has been demonstrated (73,74).

1.2. The Portuguese BZD prescribing and utilization context

Portugal has one of the highest BZDs prescription trends compared to other European countries. This fact is a major concern and has been highlighted by both Portuguese and international agencies over the last 20 years, as summarized in the following Table 1:

Table 1. Summary of publications highlighting the excessive prescription and utilization of BZDs in Portugal.

Year	Agency	Publication	Description
1999	Instituto Nacional de Saúde	Inquérito Nacional de Saúde 1998/1999 (75)	7% of men and 18% of women (aged 15 years and over) reported having taken sleeping pills in the two weeks prior to the survey. This proportion increased to 14%, in the age group of 45-54 years old and to 28% in the age group of 85 years or older
2004	Ministérios das Actividades Económicas e do Trabalho e da Saúde	Law decree 1471/2004 (76)	Defines hypnotics as treatments for short/medium duration, hence limiting the package size and prescription renewal
2005	International Narcotics Control Board	Report of the International Narcotics Control Board for 2004 (77)	The report highlighted that the rate of licit consumption of psychotropic substances in Portugal was higher than that of every other European country except Ireland. The Board called on the Government of Portugal to examine the system of control of the distribution of pharmaceutical products, as well as practices concerning the prescription and use of BZDs
2005	Observatório Português dos Sistemas de Saúde	Novo Serviço Público da Saúde. Novos desafios (78)	Draws attention to the Priority Goals for Accessibility of Medicines of the National Health Plan 2004-2010, regarding the consumption of anxiolytic, hypnotic, sedative and antidepressant drugs in the outpatient national health service market, which in 2001 was 89 DDD/1000 inhabitants/day (DHD). The target was to reduce this amount by 20% by the year 2010
2006	INFARMED	Utilização de Benzodiazepinas em Portugal Continental (1999-2003) (35)	Between 1999 and 2003, positive growth and greater use of anxiolytic BZDs was observed in Portugal (3.8%; 72.66 DHD). In 2003, the region of Alentejo had the highest BZDs utilization. It was therefore advised to reinforce initiatives aimed at both health care providers and users, leading to a reduction in the chronic use of these drugs
2006	Instituto Nacional de Saúde	Inquérito Nacional de Saúde 2005/2006 (79)	A large number of people in Portugal reports taking medication for anxiety and nervousness (645,014, so approximately 6.5% of the population) and for sleeping (837,327, so approximately 8.4% of the population)

Year	Agency	Publication	Description
2009	Observatório Português dos Sistemas de Saúde	Relatório da Primavera 2009 - 10 / 30 Anos: Razões para continuar (80)	It was reported that about 36% of individuals with a probable existence of psychological distress took medicines for anxiety, depression, or for sleeping; consumption was higher in women (40.7%) and in Alentejo (39.8%)
2010	Observatório Português dos Sistemas de Saúde	Relatório da Primavera 2010: Desafios em tempo de crise (38)	The report advised to consider the misuse of anxiolytics and hypnotics, and their effects on health expenses, as a serious public health problem
2012	Observatório Português dos Sistemas de Saúde	Relatório da Primavera 2012: Crise & Saúde, Um país em sofrimento (81)	In the period under analysis (2002–2011), there was an increase of 15.3% in the consumption of anxiolytics, resulting from a slight increase in consumption each year until 2010, when it reached its highest value (73 DHD), followed by a decrease of 3.8%, from 2010 to 2011
2013	Observatório Português dos Sistemas de Saúde	Relatório da Primavera 2013: duas faces da saúde (82)	Anxiolytics and hypnotics increased slightly (1,5%) in the outpatient market between 2011 and 2012. This increase was significantly greater in the population over 65: prescriptions for anxiolytics more than doubled between 2011 and 2012 in this age group
2013	Nova Medical School – World Mental Health Surveys Initiative	Estudo Epidemiológico Nacional De Saúde Mental I Relatório (83)	In the 12 months prior to the interview, almost a quarter (23.4%) of women and a tenth (9.8%) of men in the general population had taken anxiolytics
2013	INFARMED	Psicofármacos: Evolução do consumo em Portugal Continental (2000 – 2012) (36)	According to this report, in 2012, Portugal showed the highest consumption of anxiolytics, sedatives and hypnotics (96 DHD) in Europe, much higher than Denmark (31 DHD), Norway (62 DHD) and Italy (53 DHD); The fact that Portugal had the highest level of BZD use was highlighted in a report by the International Narcotic Board, which advised Portugal to analyse practices regarding the prescription and use of BZDs
2013	Direção Geral de Saúde - Programa Nacional Saúde Mental	Portugal Saúde Mental em Números 2013 (84)	This report highlights that although international guidelines recommend that BZDs not to be used for periods longer than four weeks, these guidelines were ignored in Portugal. Furthermore, the BZDs that were most consumed (alprazolam and lorazepam), due to their anxiolytic potency and duration of action, are among those with the highest risk of inducing tolerance and dependence
2014	Observatório Português dos Sistemas de Saúde	Relatório da Primavera 2014: saúde síndrome de negação (85)	This report highlighted the continuous increase of anxiolytics, sedative, and hypnotics drug utilization, claiming that this fact was at odds with what was predicted and verified in other European countries, where, generally, there was a decrease in their consumption along with a simultaneous increase in antidepressant use
2014	Direção Geral de Saúde - Programa	Portugal Saúde Mental em Números 2014 (86)	This report referred to the existence of a public health problem, possibly indicative of prescriptive malpractice, stemming from most of the drugs in question belonging to the BZD group

Year	Agency	Publication	Description
	Nacional Saúde Mental		
2015	Direção Geral de Saúde - Programa Nacional Saúde Mental	Portugal Saúde Mental em Números 2015 (87)	The continuing increase in prescriptions meant that this pharmacological group remained at a "risk level" in terms of public health
2017	INFARMED	Benzodiazepinas e análogos 2016 (88)	Portugal was identified as the OECD country with the highest reported consumption of anxiolytics, hypnotics and sedatives: in 2015, Portugal consumed 114 DHD in the total market and 96 DHD in the reimbursed market; furthermore, there were 1.9 million users who received at least one BZD or similar in 2016. These users were mostly female (70%), aged between 55 and 79 (52% female). The prescription of most BZDs came from the public sector (69%), namely primary health care (82% from the public sector). The prescription patterns were similar across primary health care in different health regions. This report stated as a limitation the impossibility of associating prescription with diagnosis
2017	Direção Geral de Saúde - Programa Nacional Saúde Mental	Relatório da Avaliação do Plano Nacional de Saúde Mental 2007-2016 e propostas prioritárias para a extensão a 2020 (89)	Report stating the consumption of psychotropic drugs, namely BZDs, in Portugal was almost double the average of other European countries. This report suggested that prescription was a very frequent therapeutic option in Portugal when addressing anxiety and depressive disorders. It hypothesized that the excessive prescription might be motivated by the unavailability of alternative and more effective therapeutic proposals
2017	Direção Geral de Saúde - Programa Nacional Saúde Mental	Programa Nacional Para a Saúde Mental 2017 (90)	Proposed as a goal for 2020 to reverse the trend of BZD prescription in the population
2017	INFARMED	Monitorização do Consumo de Medicamentos Jan-Dez 2017 (91)	Anxiolytics, sedatives, and hypnotics were reported to be the third-most used therapeutic drug class. 10,622,652 packages were sold in 2017, representing 6.8% of the weight in the medication market in Portugal; this corresponded to an increase of 0.1% from 2016
2018	Organization for Economic Cooperation and Development EU (OCDE-EU)	Health at a Glance: Europe 2018	Reported that Portugal was the fourth country in Europe with more older people taking BZDs (85 per 1000 people aged 85 years and older) and the second in terms of the number of older people taking long-acting BZDs (54 per 1000 people aged 65 years or older)
2018	Ministério da Saúde	Retrato da Saúde 2018 (93)	Reported that the excessive use of BZDs and antidepressants to treat insomnia, anxiety, and depression was worrying and reflected some problems in the mental health of the Portuguese population
2018	INFARMED	Monitorização do Consumo de	Anxiolytics, sedatives, and hypnotics were the third most-used therapeutic class. 10,475,832 packages

Year	Agency	Publication	Description
		Medicamentos Jan-Dez 2018 (94)	were sold in 2018, representing 6.5% of the weight in the medication market in Portugal; this corresponded to a decrease of 1.4% from 2017
2019	Observatório Português dos Sistemas de Saúde	Relatório da Primavera 2019: Saúde um direito humano (95)	The report highlights recently published numbers of BZD consumption by older people as a major public health problem still to be addressed
2019	Conselho Nacional de Saúde	Sem mais tempo a perder – Saúde mental em Portugal: um desafio para a próxima década (96)	The report highlighted the high consumption of BZDs in Portugal and the inefficiency of measures applied to change this reality. It also mentioned the need for publications and measures to discontinue BZD utilization as a national priority
2019	INFARMED	Monitorização do Consumo de Medicamentos Jan-Dez 2019 (39)	Anxiolytics, sedatives, and hypnotics were the fourth most-used therapeutic drug class. 10,329,106 packages were sold in 2019, representing 6.5% of the weight in the medication market in Portugal; this corresponded to a decrease of 1.4% from 2018

The Portuguese National Health Directorate (a government agency) and the Portuguese Health Ministry have implemented measures to improve the utilization of BZDs, namely by introducing clinical guidelines and contractual clauses conditioning primary health care doctor's incomes. National prescribing orientations are commissioned by the National Health Directorate to academic researchers and key opinion leaders. This agency also monitors the quality indicators set in each of its guidelines (97,98). These guidelines are published on the agency's website (www.dgs.pt). Health professionals are expected to regularly visit this website to keep up to date with the latest clinical recommendations.

The Portuguese National Health Directorate has issued Clinical Orientation Standards on the treatment of anxiety and insomnia using BZDs in 2011, which were updated in 2015 (99). Despite the importance of having national orientation on this matter, these guidelines are not normative and lack specificity in aspects such as: 1) due to the risk of falls (100) and the association with cognitive impairment, the use in the elderly should be strongly discouraged, but instead the Clinical Orientation Standards only briefly mentioning that the doctor should warn about these possible secondary effects before prescription (11,101,102); 2) use with alcohol: the orientations lack any reference regarding recent findings associating joint utilization of BZD and alcohol as suicidal method (13); 3) bone fractures: the Clinical Orientation Standards does not highlight the importance of the association between BZD use and falls and bone fracture (7,9,103). 4) dementia: even though recent studies associate long-term utilization of BZDs with dementia (14,102,104), this fact is not mentioned; 5)

withdrawal: the Clinical Orientation Standards mentions the need for limiting the duration of treatment and the importance of progressively reducing the dose, but lack guidance on how to reduce and stop BZD utilization (105); and 6) duration of treatment: the Clinical Orientation Standards advise prescription for periods up to 12 weeks, although other European guidelines (namely the UK's National Institute for Health and Care Excellence guidelines) are much more restrictive. Research demonstrates that the implementation of these Clinical Orientation Standards did not affect BZDs prescription trends (106).

In Portugal, National Health Service (NHS) primary care GPs work in units of typically with 4 to 12 doctors, along with nurses and secretaries. On average, each GP cares for about 1,700 patients. The NHS distinguishes two types of primary care units: the default one is the 'personalized care units' model (UCSP), in which professionals receive a fixed salary; the second is the 'family health units' model (USF), which enjoys higher functional and organizational autonomy (107). 'Family health units' start as type-A units, in which professionals receive a fixed salary, as in the former model. If these type-A units meet quality indicators targets, they become type-B units, in which health professionals have a mixed payment scheme that includes salary, capitation, and pay for performance (63).

A quality indicator, called *proportion of enrolled aged 65 years and over, who were not prescribed anxiolytics, sedatives, or hypnotics, in the period under review*, is available to be contracted in some Portuguese primary health care units (108). The most recently published data show, however, that this quality indicator has not been considered for the mixed payment scheme in most type-B units (108).

Electronic prescribing has been mandatory for all NHS reimbursed drugs since 2012. All prescription information is collected centrally by the NHS (109).

All primary health care units in Portugal have an electronic system for data registration. It has been continuously advised to GPs, especially those integrating the USF primary health care unit's model, to register the symptoms, complaints, and diagnosis presented by patients at consultations using the International Classification of Primary Care, second edition (ICPC-2) developed and updated by the World Organization of Family Doctors' (WONCA) International Classification Committee (WICC).

Since 2012, the online prescription program utilized in primary health care units, the PEM, warns prescribers about the adequacy of prescription according to clinical guidelines. Although this measure did have a significant impact on other drugs, GPs are renowned for

turning the electronic reminders/alerts off or ignoring all alerts that appear (42); not surprisingly, this measure did not show any significant impact on prescription and utilization trends for BZDs.

The reduced number of mental health specialists and the workload of GPs in Portugal may limit their availability for periodic replication of educational mental health interventions in primary care. Thus, using innovative and more flexible methods implying a lower cost and which would allow for dissemination at a national level, such as using new technologies, should be considered for the implementation of interventions that could lead to a broader effect involving a more significant number of health professionals.

1.3. Medicalization and psychopharmaceuticalization

The concept of medicalization was framed by Irving Zola (110) to signal the extensions of medical jurisdiction, authority, and practice into increasingly broader areas of people's lives. Significantly, Zola saw the medicalization of society not as an imperialistic act of the medical profession alone but rather, as he phrased it, as “an insidious and often undramatic phenomenon accomplished by ‘medicalizing’ much of daily living, by making medicine and the labels ‘healthy’ and ‘ill’ relevant to an ever increasing part of human existence” (110). The reason behind this process of the medicalization of society was, according to Zola, the increasingly complex technological and bureaucratic system that fed a reliance on the expert. In Zola's analysis, medicalization is a tendency of society to reduce a social problem to an individual one and to find a technical—a biomedical—solution at the individual level. In a concordant sociological view, Conrad defines medicalization as a process whereby nonmedical problems become defined and treated as medical problems, usually in terms of illnesses or disorders (111).

Analysts have long pointed to social factors that have encouraged or abetted medicalization: the diminution of religion; an abiding faith in science, rationality, and progress; the increased prestige and power of the medical profession; and a general humanitarian trend in Western societies. These factors, rather than being explanatory, set the context in which medicalization occurs (111).

Medicalization can occur on at least three distinct levels: the conceptual, the institutional, and the interactional levels (111). At the conceptual level a medical vocabulary (or model) is

used to define the problem at hand. At the institutional level, organizations may adopt a medical approach to treating a particular problem in which the organization specializes. At the interactional level, physicians are not directly involved; rather, medicalization occurs here as part of doctor-patient interactions, when a physician defines a problem as medical or treats a 'social problem' with a medical form of treatment (e.g. prescribing anxiolytics for an unhappy family life) (111). The medicalization of life events may be largely influenced by the interaction with and pressure of the public's decreasing tolerance of mild symptoms. While physicians and the medical profession have historically been central to medicalization, doctors are not simply colonizing new problems or labelling feckless patients. Patients and other laypeople are increasingly acting like consumers. They can be active collaborators in the medicalization of their problems, or even downright eager for medicalization, although sympathetic professionals are usually needed for successful claims-making (112).

Social consequences of medicalization occur regardless of medical efficacy. There are negative consequences, such as the assumption of medical moral neutrality, domination by experts, the individualization of social problems, the depoliticisation of behaviour, and the dislocation of responsibility. Criticism of medicalization fundamentally rests on the sociological concern with how the medical model decontextualizes social problems, and collaterally places them under medical control. This process individualizes what might be otherwise seen as collective social problems.

In the age of biomedicalization, biological science has become the overarching scientific discourse that claims to explain both psychological and social phenomena. Hence neither the psychological nor the social science discourse is seen as a valid scientific framework for explaining emotions and moods (113). The medicalization of emotions constitutes a discourse that not only provides a biomedical definition of pathological emotions but also suggests a remedy: for example, mood disorders can be corrected by means of psychopharmacology (113).

Medical prescribing is not only determined by knowledge, competence, benefits versus risks, and cost-effectiveness. Factors such as personal values, beliefs, attitudes and experiences, health service organization, information availability, patient characteristics and requests, and peer interactions are also essential in shaping prescriber's decisions (63,114). The wide availability of BZDs in the first periods of commercialization, under the belief that they were benevolent drugs, led to their wide prescription to deal with common feelings in response to daily life difficulties.

Although early studies suggested some dependence potential, this did not seem to materialize in practice. Because of this, initial concerns about BZDs soon subsided, and they quickly became amongst the most successful drugs ever introduced. Inevitably, their usage increased, and their indications widened to cover non-medical conditions, such as social, personal, or interpersonal problems, beyond recognized medical conditions. Thus, the medical profession found itself providing a pharmacological response to non-medical problems, a situation with profound implications for society as a whole. The medicalization of social problems, i.e., their conversion into individual health problems, as previously introduced in this section, resulted in a significant increase in the number of chronic users of BZDs with the associated increased risk of developing dependence on these drugs (40).

The concept of the pharmaceuticalization of society (115) is defined as the process through which various aspects of the human condition are addressed or improved through the use of pharmaceuticals, and “the process by which social, behavioural or bodily conditions are treated or deemed to be in need of treatment with medical drugs by doctors or patients” (116). This concept definition is important as the established necessity for pharmaceuticals may legitimate their use. The concept of psychopharmaceuticalization, points explicitly to the increasing importance of medicines to treat psychological distress (117). The process of constituting of psychological problems as a medical matter is thus reflected in the cultural imaginary, leading the average individual to include these medical categories in the way they view their psychological suffering, and also to consider the prescription of psychotropics as a rightful treatment to pacify this suffering (117). Consequently, the processes of psychopharmaceuticalization is also recognized as a pressure to prescribe exercised by physicians. Aspects of psychopharmacology flourish through the lay consumption of these medicines, and lead to an increasing use of doctors to control and guide the resolution of psychosocial difficulties.

The prescription of medicines that provide "joy" and "tranquillity", besides showing a drive for the medicalization, as previously introduced in this section, and control of negative emotions and for the increase of the categories considered pathological and abnormal, also expresses and allows morale to improve our abilities, and enables people to better adjustment to the demands of life we aspire to (118). The increased demand aiming for a ‘better’ mental health and, above all, its ‘generalization’ to non-biological/non-medical aspects, have contributed to the practice of family physicians taking on much of the treatment of new

situations – namely sadness and anxiety - that increasingly fall within the field of medicine (117).

Prescribing is a symbolic act and an effective style of communication. In the prescription, the doctor signals to the patients who he is. Rarely is the division of roles between doctor and patient clearer than in the act of writing a prescription. The doctor tells the patient that he understands his problem and can do something about it through the prescription. Whyte (119), in a chapter discussing medicines as a form of communication, proposed five facets of the medical act of prescription:

First, prescribing as a way of dealing with uncertainty. Medical consultations are – almost by nature – highly ambiguous situations. Patients' complaints, which may have a long and twisted history, are summarized in a few words, and have to be 'deciphered' by a doctor who cannot feel what they feel. The concreteness of the prescription overshadows the abstractedness of the unanswered questions. The medicine offered is the materialization of a comforting word. Simultaneously, the prescription not only allays the patient's anxiety but also works for the doctor's, restoring the latter's confidence in his own competence. Particularly when patients bring non-medical complaints, medication constitutes the silent language between doctor and patient. It offers the opportunity to look away from the problem and to think of more hopeful prospects.

Second, prescribing as a token of concern. It shows that the doctor is a good doctor. Far from being an anonymous commodity, the medicine becomes a symbolic representation of the doctor's self. The prescription is a metonymic extension of the doctor, and the prescription consists of the material proof that the doctor and the patient are connected to one another.

Third, prescribing as the prerogative of doctors. It is an act in which they express and reaffirm their authority over patients and over other professional colleagues, such as nurses and pharmacists. Prescribing prevents further discussion and constitutes a kind of silent communication. The positive appreciation of the prescription not only conceal the fact that hardly any communication might have taken place and that uncertainty still exists, but also offsets patients' disappointment about the briefness of the encounter. In fact, for the doctor, prescribing might be the most effective way to deal with the persistent shortage of time and the overload of patients. In a crude, yet probably very realistic way, writing a prescription can best be described as a closing ritual which is intended – and often succeeds – to send the

patient away with hope and positive feelings towards his medical problem, himself, and the doctor. Moreover, it provides the patient with legitimation that he is really sick.

Fourth, the prescription as script has its own significance. The prescription is one of the most cherished paraphernalia of the doctor to express his superior knowledge and authority. But as an inscription, it is highly significant for the patient as well.

Fifth and finally, White discusses biomedical irrationality as a possible side-effect of communication through prescription. If doctors allay their uncertainty by prescribing, one might ask whether their prescription meets the standards of their own profession. As concerning as this thought may seem, studies have shown that physicians' prescribing practices are more influenced by patients' and caretakers' social expectations than by their own medical knowledge. This fact is also illustrated by a large body of evidence discussing doctor's barriers to following clinical guidelines (119), particularly concerning BZD prescription (120).

Notwithstanding the recognition of the existing and growing trivialization of psychotropic prescription (121,122), to a certain extent, we also have to consider that until recently, the stigma of suffering from a mental illness prevented patients from looking for an adequate treatment (24). Data from the Portuguese mental health epidemiologic study (83), relate to this fact by showing that the average time required for a patient to receive proper treatment for depression in Portugal was four years. Hence, it has to be taken into account that although in some cases, drug prescription might be inadequate, the increasing trend in psychotropic prescription may also represent an answer to a previously unmet treatment need.

1.4. Research concerning reasons for sustained high BZD prescription trends and barriers to changing the excessive prescription of BZDs

Beyond recognizing the influence of the theoretical concepts addressed above, research has explored the barriers that prevent GPs from changing their excessive prescription patterns for BZDs.

There is evidence suggesting that GPs typically fail to accurately diagnose mental health disorders. In a study carried out in Canada, of 840 primary care patients assessed, 27.2% of

patients met the criteria for major depressive disorder, 11.4% for bipolar disorder, 12.6% for panic disorder, 31.2% for generalised anxiety disorder, and 16.5% for social anxiety disorder. Yet misdiagnosis rates reached 65.9%, 92.7%, 85.8%, 71.0%, and 97.8% for these disorders respectively (123).

A qualitative study with five focus groups including 35 GPs, focusing on their perspectives on initiating BZD prescribing, reported that GPs referred to feeling overwhelmed by the psychosocial problems of their patients; they considered prescribing as a way of showing empathy; and in certain situations they felt that there were no other solutions and they experienced BZDs as a lesser evil (124). This study also reported that GPs admitted resorting to BZDs because of time restraints and a lack of alternatives, and that GPs did not perceive the addictive nature of BZD consumption as a problem with first-time users (124).

A study carried out in Brazil and Cuba sought to understand the practices related to the use of BZDs in primary care and the meanings that health professionals attribute to them. The fieldwork adopted individual interviews and focus groups as data collection strategies. The data, analysed thematically, revealed five themes: 1) nobody's land: the lack of management over the use of BZDs by primary care professionals; 2) inadequate indication: BZDs were prescribed for unjustifiable situations; 3) salvation and perdition: BZDs used as a mitigation strategy by primary care professionals for the difficulties they face in acting regarding mental health; 4) little empowerment of primary care professionals to work in mental health; and 5) fragmented care: the dismantling of the psychosocial care network. The lack of appropriation of mental health issues by primary care professionals, the fragmentation of care, the overload of work with topics considered to be priorities, the deficiencies in the availability of therapeutic resources, and the poor investment in specific training were considered to contribute to inappropriate BZD prescription (125).

A systematic review exploring GPs' experiences and perceptions of BZD prescribing identified seven analytic themes, three of which directly related to maintaining high BZD prescription rates: 1) the "changing context of BZD prescribing", referring to the fact that anxiety and depression, previously treated in secondary care, are currently more often managed in primary care; 2) "perceived patient expectations", which anticipated resistance by patients before even broaching the topic of tapering/discontinuation; and 3) "GP attitudes towards different interventions", since for some GPs the 'fast acting' and effective nature of BZDs made them preferable to other forms of treatment. GPs perceived a lack of alternatives, especially for psychosocial problems, and they considered not having adequate

training; this was also found to have a clear influence on their attitude when they used BZDs (126).

A study addressing GPs' perceptions of prescribing psychotropic medication for elderly patients reported scepticism regarding nonpharmacological approaches to the treatment of conditions such as anxiety and insomnia (127). In fact, one study showed that fewer than 1% of all BZDs users were provided with or referred to psychotherapy, and this percentage was even smaller for the older population (128).

GPs often consider patients to be one of the most important barriers to changing BZDs prescribing patterns (124). Understanding patient's profiles as they relate to higher prescription trends might help to overcome this fact. There is a gap in the evidence concerning the definition of patient's profiles in terms of for whom BZDs are more frequently prescribed (or perhaps harder to discontinue). One study identified the following factors associated with a long-term prescription: older age, psychiatrist-prescriber (rather than non-psychiatrist-prescriber), any psychiatric disorders (rather than non-psychiatric disorders), a high BZD dose, hypnotic (rather than anxiolytic only), medium or long half-life of BZDs, regular use (rather than use as needed), and the use of concomitant other psychotropic drugs (129). Another study found that clinicians prescribed BZDs disproportionately to patients with at least some known risk factors for BZD-related adverse events, including increased age, pulmonary diseases, osteoporosis, and substance use disorders (130). A study performed in a large sample population again found that older age, being on social welfare, and not being married were associated with higher long-term BZD use (131). These data coincide with a study carried out in Portugal, showing that 27,3% of an older adult population was prescribed with BZDs. Patients suffering from chronic health problems were at a greater probability of receiving this potentially inappropriate medication (132).

It has been reported that patients have a low level of knowledge regarding the reasons for taking BZDs (133). In this study, an association was found between a mean duration of BZDs use of less than 120 months, a desire to stop treatment, educational status, and a good level of knowledge of the reasons for taking BZDs. To change prescription behaviour, it therefore seems crucial to improve patient's knowledge of their treatment and promote shared medical decision-making regarding BZD utilization.

In another study, regarding potentially inappropriate medication (PIM) (134), in which BZDs were included, and which looked at attitudes of older adults towards deprescribing, it was found that the openness of older adults with a polypharmacy towards deprescribing was not associated with PIM. Again, these results suggest that patients may not be aware that they are taking PIM. This implies the need for raising patients' awareness about PIMs through education, especially among women and older population, to implement deprescribing in daily practice.

A study concerning doctors' views over deprescribing identified significant barriers to it, such as lack of time, the drugs having been prescribed by other professionals, or resistance on the part of the patient or their family (135). This study considered BZDs as one of the most critical drug groups in need of deprescribing.

During consultations, time constraints have also been considered a facilitating factor for BZD prescribing and a barrier to discontinuation efforts (101).

Considering the influence of other professionals on prescribing, often other specialties or other moments of interaction with the patient lead to the initiation or maintenance of BZDs' prescription (136). An illustrative example was a study carried out in a hospital setting showing that Z-drugs seem to be attractive because experiential knowledge overemphasized their benefits and failed to take into account their risks, such as drug-related falls and confusion. Difficulties in judging a drug's risk-benefit ratio did not, however, prevent doctors and nurses from using them (137). Another example comes from a study of hospitals, in terms of initiating and increasing the prescription of hypnotic and sedative drugs and showed mixed results. The rate of patients who received these drugs increased by 16% during the 50 days after discharge, representing a considerable number of newly initiated prescriptions (138).

Communication style might be crucial to a successful deprescribing. This communication might be more challenging when it comes to addressing BZDs deprescribing than other types of drugs, such as proton pump inhibitors, as shown by a study where BZDs deprescribing conversations focused on 'if I should deprescribe' rather than 'how to deprescribe,' with 70% of older BZDs users reporting that they had never been told about the adverse effects of the drugs (48).

A recent study published in Portugal concerning physicians' beliefs and attitudes about BZDs collected data from a self-administered online questionnaire comprising four different

sections: general beliefs about BZDs; attitudes about prescription and chronic use of BZDs; self-perception of literacy about BZDs; and self-efficacy perceptions in promoting withdrawal (139). The study concluded that despite the physician's adequate awareness about the risks of chronic BZDs use is adequate, they continuously prescribe excessive amounts of these drugs to excess.

Sirdifield et al. (126) developed an explanatory model of processes underlying current prescribing practices of BZDs in primary care. This model emphasizes how prescribing BZDs is a behavioural outcome determined by several factors (GPs' attitudes towards interventions, GPs' perceptions of the patient, and GPs' sense of responsibility). Interventions should, therefore, not merely focus on acquiring knowledge about BZDs or on non-pharmacological alternatives; they should also address other determinants contributing to inconsistent prescribing practices, focusing on ambivalent attitudes and perceptions, as these are essential determinants of inconsistent behaviour and prescribing strategies.

The importance of measuring barriers and facilitators to the implementation of innovation and behavioural change has been demonstrated, using both quantitative methods (140) and qualitative methods that allow for a more detailed and personalized study of particular realities (141). Notably, concerning BZDs, a recent study demonstrates the importance of the qualitative measurement of motivations for changing the perceptions of professionals and users (142).

1.5. Behaviour change and implementation science

Despite recommendations to improve the implementation of evidence-based practice and a rapidly developing field of implementation science, implementation remains variable (143), resulting in heterogeneous outcomes even when implementing similar interventions for a very restricted identified problem, such as BZDs prescription patterns (as explored in the previous section Interventions to change prescription trends). Behaviour change might be key to improving healthcare and health outcomes.

Behaviour change involves intervening so that, all other things being equal, either: 1) the incidence of one or more activities in an individual, group, or population is different from

what it would have been without the intervention; or 2) activities are undertaken differently from how they would otherwise have been performed (144).

The Behaviour Changing Wheel (BCW) is a method for characterizing and designing behaviour-changing interventions, proposed by Michie et al. in 2011 (145). This method presents eight steps in the design process. The first four steps lay the groundwork to understanding the 'target behaviour' by defining the problem, selecting the behaviour, specifying the target behaviour, and identifying what needs to change; the next two steps aim to identify intervention functions and policy categories; the final two steps recognize behaviour-changing techniques and mode of delivery.

Defining the problem

Defining the problem in behavioural terms means being specific about 1) the target individual, group, or population involved in the behaviour and 2) the behaviour itself.

Selecting the behaviour

When selecting a specific target behaviour, one has to consider that behaviours do not exist in a vacuum, but occur within the context of other behaviours of the same or different individuals. According to the Behaviour Change Wheel (146), as applied to interventions design, once it has been established which behaviours to target, the next step is to decide which to start with. The following criteria may be useful to take into account: 1) the likely impact if the behaviour were to be changed; 2) the expected ease of changing the behaviour (local circumstances will influence, for example, financial and human resources, acceptability and preference); 3) the centrality of the behaviour in the system of behaviours, thus, the positive 'spill over' effect if the target behaviour were to be changed. Some behaviours are more 'central' in the system and changing them is likely to have an impact on other behaviours, either positive - in that it may support desired behaviour change - or negative - in that there may be negative consequences (estimating this can be helped by gathering local evidence or by consulting the research literature); 4) ease of measurement: if one wishes to evaluate the extent to which the intervention has changed the target behaviour, it should be measurable, either by routine data or by introducing new data collection procedures.

Specifying the target behaviour

After selecting the target behaviour, the next step is to specify the behaviour in appropriate detail as well as its context. According to the Behaviour Change Wheel applied to designing interventions, the more precise one can be about the behaviour, the better the behavioural analysis is likely to be, and the greater the challenge in terms of assessing it. Hence, the behaviour needs to be specified in terms of who needs to perform the behaviour; what does the person need to do differently in order to achieve the desired change; when they will do it; where they will do it; how often will they do it; and with whom they will do it.

Identifying what needs to change

Having specified the target behaviour one wishes to change, the next step is to identify what needs to change. Specifically, this means identifying what needs to change in the person and/or the environment in order to achieve the desired change in behaviour. Devoting time and effort to fully understanding the target behaviour is a critical and often overlooked step in intervention design. The more accurate this analysis of the target behaviour, the more likely it is that the intervention will change the behaviour in the desired direction.

The BCW characterizes the target behaviour in terms of Capability, Opportunity, and Motivation (the COM-B system in the Behaviour Change Wheel) (146). The COM-B model is the starting point used by the BCW for understanding behaviour in the context in which it occurs. The central tenet of the model is that for any behaviour to occur, there must be the ‘capability’ to do it: the person or people concerned must have the physical strength, knowledge, skills, stamina, etc. to perform the behaviour; there must be the ‘opportunity’ for the behaviour to occur in terms of a conducive physical and social environment (e.g., it must be physically accessible, affordable, socially acceptable and there must be appropriate time); and there must be sufficient strong ‘motivation’, i.e., they must be more highly motivated to do the behaviour at the relevant time than not to do the behaviour, or to engage in a competing behaviour. More specifically:

‘Capability’ includes both physical and psychological capabilities. Physical capability consists of the strength, stamina, and physique needed to enact a behaviour. Psychological capability refers to knowledge and cognitive skills and our intellectual capabilities of perception, memory, reasoning, analysis, and self-regulation. ‘Opportunity’ consists of the primary

environmental factors that promote or enable a behaviour. These may be physical in terms of time, financial resources, equipment, etc., or they may be social, as in the case of social cues and normative influences. 'Motivation' involves all those mental processes that energize and direct behaviour. This includes reflective processes such as planning and thinking and automatic processes concerning our feelings, habits, and instincts (143).

COM-B components can be further elaborated into 14 domains, using a more detailed tool to understand behaviour, namely the Theoretical Domains Framework (TDF) (143,147). The TDF was developed in response to requests from implementation researchers who recognized that the implementation of evidence-based practice depends on changing behaviour, and considered therefore theories of behaviour change very relevant and potentially helpful in informing implementation interventions. The framework consists of 14 domains: knowledge; skills; memory, attention and decision processes; behavioural regulation; social/professional role and identity; beliefs about capabilities; optimism; beliefs about consequences; intentions; goals; reinforcement; emotion; environmental context and resources; and social influences. Many studies have used the TDF to assess implementation problems and design interventions to improve the implementation of evidence-based practice in a variety of health settings (148). These include acute lower back pain in primary care (149), transfusion prescribing (150), hand hygiene (151), mental health (152), and GP prescribing for upper-respiratory tract infections (153). The TDF has been used primarily in the context of health to understand behaviour at the individual level. Still, it can also be used in various contexts to understand behaviour at the organizational and community level and identify external factors influencing behaviours.

Identify intervention functions

The COM-B and TDF identify what needs to shift for the desired behaviour to be achieved and, therefore, what to target in an intervention (143,145). Following this, intervention functions, defined as broad categories of means by which an intervention can change behaviour, identify effective ways to bring about that change.

The BCW theory suggests nine intervention functions: education, persuasion, incentivization, coercion, training, restriction, environmental restructuring, modelling, and enablement (146).

According to this theory, each of the intervention function can be defined as follows in Table 2:

Table 2. The nine intervention functions.

Intervention function	Definition	Example of intervention function
Education	Increasing knowledge or understanding	Providing information to promote healthy eating
Persuasion	Using communication to induce positive or negative feelings or stimulate action	Using imagery to motivate increases in physical activity
Incentivization	Creating an expectation of reward	Using prize draws to generate attempts to stop smoking
Coercion	Creating an expectation of punishment or cost	Raising the financial cost to reduce excessive alcohol consumption
Training	Imparting skills	Advanced driver training to increase safe driving
Restriction	Using rules to minimize the opportunity to engage in the target behaviour (or to improve the target behaviour by reducing the chance to engage in competing behaviours)	Prohibiting sales of solvents to people under 18 to reduce their use for intoxication
Environmental restructuring	Changing the physical or social context	Providing on-screen prompts for GPs to ask about smoking behaviour
Modelling	Providing an example for people to aspire to or imitate	Using TV drama scenes involving safe-sex practices to increase condom use
Enablement	Increasing means/ reducing barriers to increase capability (beyond education and training) or opportunity (beyond environmental restructuring)	Behavioural support for smoking cessation, medication for cognitive deficits, surgery to reduce obesity, prostheses to promote physical activity

It is crucial to start by considering the full range of possible intervention functions available, to look in the literature for the most effective intervention functions applied to the identified research problem, and to adequately link to the appropriate Behaviour Changing Techniques (BCTs), as described in the following steps.

Identify policy categories

The next step in developing an intervention strategy is to consider what policies would support the delivery of the previously referred intervention functions. The BCW framework (146) identifies seven policy categories representing the types of decisions made by authorities that help to support and enact the interventions: ‘communication/marketing’

(using print, electronic, telephonic, or broadcast media); ‘guidelines’ (creating documents that recommend or mandate practice); ‘fiscal’ (using the tax system to reduce or increase the financial cost); ‘regulation’ (establishing rules or principles of behaviour or practice); ‘legislation’ (making or changing laws); ‘environmental/social planning’ (designing and controlling the physical or social environment); and ‘service provision’ (delivering a service). In some research problems, it might only be possible to identify and suggest which policy categories would be feasible and desirable to implement the promotion of change.

Identify behaviour-changing techniques

A behaviour-changing technique (BCT) is defined as “an active component of an intervention designed to change behaviour” (146). The defining characteristics of a BCT are that it is observable, replicable, an irreducible component of an intervention designed to change behaviour, and a postulated active ingredient within the intervention (154). For every intervention function (means by which an intervention can change behaviour), appropriate BCTs techniques may be applied. The following Table 3 shows some examples of the most frequently used BCTs appropriate for each intervention function:

Table 3. Examples of the most frequently used BCTs for the nine intervention functions.

Intervention function	Most frequently used BCTs
Education	• Information about social and environmental consequences • Information about health consequences • Feedback on behaviour • Feedback on outcome(s) of the behaviour • Prompts/cues • Self-monitoring of behaviour
Persuasion	• Credible source • Information about social and environmental consequences • Information about health consequences • Feedback on behaviour • Feedback on outcome(s) of the behaviour
Incentivization	• Feedback on behaviour • Feedback on outcome(s) of behaviour • Monitoring of behaviour by others without evidence of feedback • Monitoring outcome of behaviour by others without evidence of feedback • Self-monitoring of behaviour
Coercion	• Feedback on behaviour • Feedback on outcome(s) of behaviour • Monitoring of behaviour by others without evidence of feedback • Monitoring outcome of behaviour by others without evidence of feedback • Self-monitoring of behaviour
Training	• Demonstration of the behaviour • Instruction on how to perform a behaviour • Feedback on the behaviour • Feedback on outcome(s) of behaviour • Self-monitoring of behaviour • Behavioural practice/rehearsal
Environmental restructuring	• Adding objects to the environment • Prompts/cues • Restructuring the physical environment
Modelling	• Demonstration of the behaviour
Enablement	• Social support (unspecified) • Social support (practical) • Goal setting (behaviour) • Goal setting (outcome) • Adding objects to the environment • Problem solving • Action planning • Self-monitoring of behaviour • Restructuring the physical environment • Review behaviour goal(s) • Review outcome goal(s)

Identify the mode of delivery

According to the BCW framework, as well as identifying BCTs (which are selected with the appropriate intervention functions in mind), decisions need to be made about the mode of delivery of the intervention (146). Some examples of modes of delivery for intervention functions are shown in the Figure 1 below:

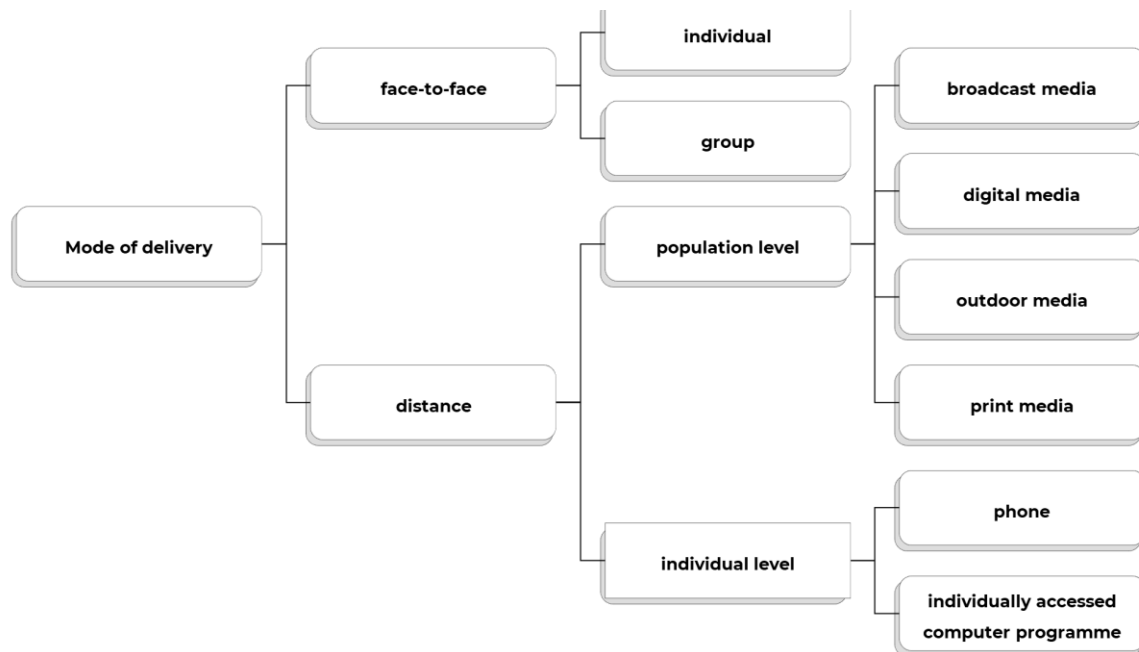


Figure 1. Modes of delivery for intervention functions.

In selecting the preferred mode(s) of delivery, the APEASE criteria (146) should be considered:

Affordability: Cost considerations when selecting the mode of delivery include how much it will cost to design and how much it will cost to deliver. There are extensive costs when designing a website or mobile phone app but these are relatively cheap to deliver once launched or made available. In comparison, a face-to-face intervention is likely to be less expensive to design than to deliver.

Practicability: The selected mode of delivery should allow for the intervention to be delivered as designed. Some BCTs might be more effectively delivered through specific modes of delivery. For example, action planning or self-monitoring of the behaviour is more likely to be effective when delivered face-to-face or over the phone rather than by outdoor media.

Effectiveness and cost-effectiveness: Where it exists, evidence of (cost-) effectiveness should be vital in guiding the selection of the delivery mode. Where the evidence base is lacking, other APEASE criteria should be used to guide selection.

Acceptability: How acceptable a mode of delivery should be considered in terms of the recipient, those delivering the intervention and whether it is aligned with political objectives.

Side-effects/safety: Intervention designers should explore the potential unintended consequences of the modes of delivery under consideration. For example, an intervention targeting an identified and potentially life-threatening gap in health professional practice might result in an unnecessary panic if delivered via broadcast or print media rather than face-to-face.

Equity: Asking whether selecting a particular mode of delivery will result in the intervention reaching the intended recipients or whether it will disadvantage some groups will guide considerations around equity. For example, when using digital media technologies, consider whether all intended groups of intervention recipients have broadly equal access.

An additional consideration when identifying the mode of delivery relates to evaluating the intervention. Delivering an intervention face-to-face will allow the designer to obtain more information about intervention recipients and follow them up when assessing the effect of the intervention.

As a final remark, when collecting information to understand the target behaviour, data should be collected from as many relevant sources as possible, as multiple perspectives will inform the most accurate picture. Triangulating data using multiple sources strengthens the understanding of behaviour. Therefore, intervention designers should also collect data using various methods, including interviews and focus groups, questionnaires, and expert opinion. If a consistent picture of a behaviour, and the factors influencing it, is obtained from more than one source and using more than one method, this increases confidence in the analysis (146). The way we applied the referred methodology and behaviour model in this study is further detailed in Part 3.

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Research aims and objectives

2. Research aims and objectives

The thesis's general objective was to evaluate the effectiveness and feasibility of implementing a DBCI platform to change BZDs prescription patterns in primary health care settings. The outline of the research was organized into three work packages. The aims and research outputs produced at each work package are presented below and summarized in Table 4:

The **first work package** (further detailed in parts 3 and 4) aimed to develop, implement, and evaluate the impact of a Digital Behaviour Change Intervention (DBCI), designated ePrimaprescribe, on BZDs prescription patterns in primary health care settings. The main hypotheses of this work package were:

- a) The use of ePrimaPrescribe DBCI would lead to a significant decrease in BZDs prescription;
- b) The use of ePrimaPrescribe DBCI would lead to a significant difference in antidepressant's prescription pattern, considering the likely need to introduce this pharmacological class in patients with excessive, prolonged use of BZDs and/or with diagnoses of anxiety or depressive disorder;
- c) The use of ePrimaprescribe educational program would improve significantly the accuracy of diagnosis coding associated with BZDs prescription.

Two original papers were produced for this work package:

Manuscript 1: *Implementing an online program to change benzodiazepine prescription: protocol of a hybrid type 1 cluster randomized trial*

Manuscript 2: *Implementing an online program to change benzodiazepine prescription: a cluster-randomized trial*

The **second work package** (further detailed in part 5) aimed to explore the barriers and facilitators for implementing an online program and changing benzodiazepine prescription in a primary health care setting.

Two main assumptions were considered in this work package:

1. The assumption that identification of facilitators and barriers influencing the implementation of an online program would contribute to the development of innovative medical education tools;
2. The assumption that a consistent and long-term BZD prescription trend change would be possible by clear identification of facilitators and barriers to that change.

Two original papers were produced for this work package:

Manuscript 3: *Barriers and facilitators to implementing a Continuing Medical Education intervention in a primary health care setting*

Manuscript 4: *Barriers and facilitators to changing benzodiazepine prescription patterns in Portugal: a mixed-methods study with general practitioners*

The **third work package**, further detailed in part 6, aimed to explore GPs' perception of BZD excessive prescription in primary health care settings. A qualitative study was designed and conducted to accomplish these objectives, and the following paper was produced:

Manuscript 5: *General Practitioners' perspectives over solutions to change BZD prescription trends – a qualitative study.*

Table 4. Summary of aims and research outputs produced at each work package.

Work package	Aims	Methodological approach	Number of research papers
1	To study the impact of a DBCI on BZDs prescription at a primary health care setting through: 1) development of an online educational platform; 2) evaluate the change on BZD prescription pattern; 3) evaluate the change in diagnosis coding	Quantitative	Two original papers
2	To analyse barriers and facilitators to implement a Continuing Medical Education online program, and to a continuous and long-term change in BZD prescription trend	Mixed methods	Two original papers
3	To explore the perception of GPs over solutions to change BZDs prescription pattern	Qualitative	One original paper

**Developing a Continuing Medical Education
online program to change benzodiazepine
prescription pattern**

3. Developing a Continuing Medical Education online program to change benzodiazepine prescription pattern

Using the Behaviour Changing Wheel (BCW) theory to design an intervention to change BZDs prescription pattern

Accumulating evidence of what works is a necessary part of developing more effective and parsimonious interventions. Standard technique definitions are required for effective implementation of interventions from research protocols to practice “in the field”. By ensuring that effective intervention techniques are delivered as intended, such definitions facilitate the implementation of evidence-based practice across different health care contexts. Hence, to achieve the intended behaviour change through our platform, we choose from a set of standardized techniques, reviewed and identified to contribute to intervention effectiveness (1).

Our intervention’s content to change BZD prescription pattern was developed based on guidelines for anxiety treatment and benzodiazepine (BZD) withdrawal.

The primary sources of information were National Institute for Health and Care Excellence (NICE) guidelines (2), which are evidence-based recommendations for health and care in England; guidelines issued by the Portuguese National Health Directorate (DGS) (3), and other relevant literature specifically addressing deprescribing evidence-based practice guidelines (4,5).

The content was organized according to the following subjects:

- pharmacological effect and clinical use of BZD: this module addressed the following themes: (BZD) historical contextualization; what are BZDs; main BZDs marketed in Portugal, doses and clinical indication; clinical indication of BZDs; excessive and prolonged use (of BZDs): why it should be a concern for GPs; tolerance, dependence and withdrawal syndrome; drug interactions; precautions and risks of use in particular situations (namely pregnancy, breastfeeding, elderly patients and alcohol withdrawal);
- how to treat anxiety disorder avoiding the continuous use of BZDs: this module addressed the following themes: anxiety disorder approach at the primary health care

setting; what is an anxiety disorder; neurobiology of anxiety disorders; most frequent anxiety disorders; symptomatic overlap of depressive disorder and anxiety disorder; diagnostic assessment and treatment of anxiety disorder.

- how to manage BZDs dependence and advise to BZDs withdrawal: this module addressed the following themes: identification of BZDs dependency situations; reasons for GPs to advise the discontinuation of BZDs; how to evaluate a user willing to stop BZDs; how to discontinue the use of BZDs; proposals for discontinuation or switch schemes and subsequent discontinuation; how long may it take to discontinue BZDs; how to manage discontinuation symptoms; advice to be given to users who are discontinuing BZDs; discontinuation of BZDs using substitution by other groups of drugs; how effective is the intervention at discontinuation.

Our intervention design then applied a theory-based, systematic eight-step method using the Behaviour Changing Wheel framework, the Theoretical Domain Framework (TDF), and Behavioural Changing Techniques (BCTs) described in Part 1 - section 6: Behaviour change and implementation science.

Step 1: Define the problem in behavioural terms

The first step when defining the problem is identifying who is involved in the behaviour and what the behaviour is.

GPs are responsible for the majority of BZD's prescription and renewal (6,7). In most countries, they should be the first health professionals to be consulted in situations of psychological distress.

In this context, we choose all GPs from one region in Portugal as the target population for our behavioural change intervention.

Step 2: Select the target behaviour

After defining the behavioural problem, the next step is to list the behaviours that could prevent excessive BZD prescription.

What might seem a simple and single behaviour, such as, in our case, prescription of a specific drug, is influenced by the behaviour of several others, including other doctors working in the same primary health care unit, organizational demands of daily practice, and patients. Concerning our research problem and having in mind the literature describing multiple failed attempts to change the excessive prescription behaviour, it is useful trying to define a list of all the potential behaviours that may be relevant to the problem, such as improving the ability to recognize anxiety symptoms and improving knowledge on BZDs withdrawal strategies.

Improving the ability to recognize anxiety symptoms and improving knowledge on BZDs withdrawal, strategies may be considered having:

1. high impact on predictable consequences of long-term usage of BZDs (dependence, tolerance, inadequate treatment of psychological distress/mental disorder, falls, memory problems, etc.);
2. high difficulty of change because of prescription inertia, pressure from patients, and resource limitation;
3. moderate 'spillover' since changing BZDs prescription pattern would probably influence other GPs to do so and also encourage further reflection on the delivery of mental health care in primary health care settings;
4. high measurability, through the collection of prescription data and qualitative data from GPs, concerning aspects such as practicability, effectiveness, and acceptability of the intervention aiming to change the behaviour.

Step 3: Specify the target behaviour

As mentioned in Part1- section 6 – the more precise one can be about the behaviour, the better the behavioural analysis is likely to be. Taking our research problem as an example, “avoiding BZD prescription”, is less likely to help to decide what to do than “improving GPs’ knowledge on anxiety diagnosis” and “providing BZDs withdrawal strategies”.

The selected target behaviour is described in detail in Table 5.

Table 5. Selected target behaviours included in the intervention.

Specification criteria	Target behaviour
	Changing excessive BZDs prescription pattern through “improving GPs’ knowledge on anxiety diagnosis” and “providing BZDs withdrawal strategies”
Who needs to perform the behaviour?	GPs
What do they need to do differently to achieve the desired change?	Propose withdrawal strategies to patients using BZDs for longer than 12 weeks Propose alternative treatments to help patients with anxiety and depression symptoms Inform patients about the risks of continued BZD usage
When do they need to do it?	During primary health care appointments
Where do they need to do it?	At primary health care units
How often do they need to do it?	Every time they see a patient with a BZD prescription
With whom do they need to do it?	Not dependent on others

Step 4: Identify what needs to change

Having selected and specified the target behaviours, we performed a behavioural analysis using the COM-B model to determine what needed to happen for the target behaviour to occur and what, in terms of capability, motivation and opportunity, needs to shift in the current context.

Table 6 below describes this analysis:

Table 6. Analysis of the COM-B components applied to the intervention.

COM-B Components	What needs to happen for the target behaviour to occur?	Is there a need for change?
Physical capability	Having the skills and being able to read/write/use a computer to access information on how to improve anxiety diagnosis recognition and improving knowledge on BZDs withdrawal strategies	No change needed since all doctors use computers and are used to having continuous training throughout their career
Psychological capability	Awareness of the existence and of the need to improving knowledge of anxiety diagnosis, and of the need to implement BZDs withdrawal strategies; the ability to retain information and to make decisions leading to changing prescription pattern	Change needed
Reflective motivation	GPs need to feel confident about their ability to diagnose anxiety; they need to feel competent to suggest and support patients to initiate BZDs withdrawal strategies	Change needed
Automatic motivation	Establish incentives Associate the continuing excessive BZD prescription pattern to negative emotions/worry	Change needed
Physical opportunity	Improving environmental context and resources such as time and human resources	Change needed
Social opportunity	Increasing social awareness of the importance of improving anxiety diagnosis and treatment; improving social conscience over the need to reduce BZD intake	Change needed
Reflective motivation	Intend to prioritize avoiding BZDs prescription	Change needed
Automatic motivation	Establish reminders, routines, and habits to avoid BZDs prescription and to suggest BZD withdrawal	Change needed
Behavioural diagnosis:		
Changing BZD prescription behaviour is a complex intervention, implying changes in most COM-B components		

Besides this primary analysis, after intervention implementation, we further asked GPs their perceptions over specific behavioural features where an intervention could have a significant impact. This analysis is detailed in Part 5 and 6 of this manuscript.

Step 5: Identify intervention functions

Having identified the target behaviour drivers, we then selected the relevant functions that the intervention should serve. The following Table 7 shows selection of intervention functions, according to practical criteria of relevance, affordability, acceptability, practicability, and likely impact.

Table 7. Selected intervention functions applied to the intervention.

Candidate intervention functions	Is the candidate intervention function relevant, affordable, acceptable, practicable, likely to impact this context?
Education	Yes (increasing knowledge over the health impact of a continuing BZDs prescribing pattern)
Persuasion	Yes (using communication techniques aiming to induce negative feelings when prescribing BZDs and stimulation the action of advising deprescription to patients)
Incentivization	Not practicable or affordable (but eventually desirable)
Coercion	Unlikely to be acceptable
Training	Yes (by imparting deprescription skills through withdrawal schemes)
Restriction	Yes (providing advice and practical rules to reduce the opportunity to engage in excessive prescription behaviour)
Environmental restructuring	Not practicable or affordable (but eventually desirable)
Modelling	Yes (providing examples for doctors to follow)
Enablement	Yes (since intervention increases the means and reduced the barriers to increase capability or opportunity)

It is worth noticing that our intervention was initially conceived as an educational intervention. By taking the steps described, we could see that, besides education, other types of intervention can be used to bring about the desired change. For example, GPs need to be persuaded that continuing excessive BZDs prescription would increase the risk of falls in older patients. GPs need to be confident that improving their ability to identify anxiety symptoms would bring a better quality of life for their patients. GPs need modelling on exactly how to perform BZDs withdrawal in specific situations (e.g., old woman taking 3mg a day of alprazolam) to feel confident and motivated to suggest a change that predictably would imply resistance from patients.

Step 6: Identify policy categories

It has been suggested that changes in prescribing patterns, and in a more comprehensive perspective, changes related to improving mental health quality of care do not directly depend on policy measures. Notwithstanding, political measures are mentioned and discussed by participant GPs in Part 5 and 6. Hence, broader organizational interventions, especially if suggested as meaningful by GPs who are directly involved in continuing inadequate BZDs prescribing patterns, may include tailored effective political measures.

Step 7: Identify behaviour change techniques (BCTs)

We chose the following standardized techniques for behavioural change to be the most appropriate in contributing to the successful implementation of an intervention with our specific objectives:

Table 8. Selected BCTs applied to the intervention.

Instruction on how to perform a behaviour	Advise or agree on how to perform the behaviour (includes 'Skills training')
Information about health consequences	Provide information (e.g., written, verbal, visual) about the health consequences of performing the behaviour
Behavioural practice/rehearsal	Prompt practice or rehearsal of the performance of the behaviour one or more times in a context or at a time when the performance may not be necessary to increase habit and skill
Habit formation	Prompt rehearsal and repetition of the behaviour in the same context repeatedly so that the context elicits the behaviour
Credible source	Present verbal or visual communication from a credible source in favour of or against the behaviour
Verbal persuasion about capability	Tell the person that they can successfully perform the wanted behaviour, arguing against self-doubts and asserting that they can and will succeed

Step 8: Identify mode of delivery

We chose to design and implement a Digital Behaviour Change Intervention (DBCI) from the available modes of delivery of intervention. DBCIs are behaviour change interventions that involve computer technology or digital encoding of information (8). DBCIs have the potential for low unit-cost, high reach, effective and acceptable ways to benefit individuals and society. Compared with human-delivered interventions, they usually deliver the intervention content with a high degree of fidelity. DBCI may improve health by improving health professional adherence to evidence-based guidelines and enhancing health professional effectiveness or efficiency (8).

An adequate context for development/testing and evaluation of DBCIs has to consider the following factors (8):

Acceptability – To what extent is an online intervention likely to be acceptable to key stakeholders, including users, funders, and those charged with implementing it?

Practicability – To what extent can the intervention be implemented as designed to the intended users at scale?

Effectiveness – To what extent is the intervention likely to achieve or exceed a desired level of effectiveness for a given target behaviour and how cost-effective is it likely to be, concerning the desired outcome?

Affordability – Can the intervention be implemented at the desired scale to the intended users within a realistic budget?

Safety – To what extent the intervention is likely to have unwanted side-effects?

Equity – To what extent the intervention is likely to increase or decrease economic, social, or health inequalities?

Our research intended to clarify these factors using a qualitative methodology, as further developed in Part 5.

We started developing our concept for a DBCI aiming to change BZDs prescription patterns, by addressing some key questions to ground our developmental/implementation/evaluation process (8).

1. Why a DBCI-based intervention to change excessive BZD prescription?

As previously exposed in Part 1 – Section 2: Many interventions to change prescription trends have been implemented with inconsistent and short-term effects.

The time and limited resources in primary care settings to manage anxiety disorders might mean that an intervention with freedom and at the convenience of usage is a good option for an educational intervention. Also, the unit-cost of such intervention might be very low, with the possibility of distribution for a national setting after appropriate designing and testing. Although other types of interventions have been tried, no online program, with a person-based approach, and having into consideration a changing behavioural perspective since the start of the development phase, to our knowledge, has even been implemented in a randomized control trial in Portugal.

2. How will it address the ‘big question’ in behaviour change? In more detail meaning:

What interventions (defined in terms of features of content and delivery), with what usage (defined in terms of uptake, level and type of engagement in those using it), in what context (defined in terms of features of the target population and the setting) has what effect on what behaviours, through what mechanisms of action? For many interventions, such as DBCIs, a key part of this is: What benefits can be achieved by what degree and type of personalization?

ePrimaPrescribe was originally designed as an educational program but further developed to consider other intervention functions such as persuasion, training, restriction modelling and enablement, as previously mentioned. It aimed to be an online program, with a voluntary usage, available in a free and easily accessible online platform, designed specifically to primary health care setting, with an effect on prescribing behaviour.

3. What kind of DBCI will it be?

We considered for the program development that it had to be usable and effective. Hence, we developed an online program available through an easy to access Moodle platform, which was tested before implementation (as further described in part 3 – manuscript 1).

4. What data will be collected, and how will they be used?

Data was gathered from the beginning of the program designing. As previously mentioned, the process for the development of a DBCI must be very interactive. We chose a person-based approach by testing the program early in the developmental process and then through evaluation and optimization using quantitative and qualitative research methods (Part 5 and 5).

Testing of DBCIs should take place from the moment the concept is first mooted (8). The basic idea must be tested for conceptual clarity and sound assumptions and analysis. It should also be tested with potential stakeholders, including users.

The person-based (developmental) approach places emphasis on user involvement from the initial formulation of the concept, right the way through to implementation (9). There are two critical elements of the person-based approach. The first is a developmental process involving qualitative research with people from the target user populations, carried out at every stage of intervention development, from planning to feasibility testing and implementation. This process goes beyond assessing acceptability, usability, and satisfaction, allowing the intervention designers to build a deep understanding of users' psychosocial context and their views of the behavioural elements of the intervention. Insights from this process can be used to anticipate and interpret intervention usage and outcomes. Most importantly, it can modify the intervention to make it more persuasive, feasible, and relevant to users. The second element of the person-based approach is identifying "guiding principles" that can inspire and inform the intervention development by highlighting the distinctive ways that the intervention will address key context-specific behavioural issues (9). Having these principles in mind, we have tested the ePrimaPrescribe platform feasibility from its development to implementing a first ready to use version, as further detailed in our study protocol described in part 4.1.

As a final remark, the evidence must be gathered about whether the intervention is creating the kind of effect it was designed to and to assess its usability. It is essential to recognize that evaluation involves much more than effect size estimation. It involves assessing how far the intervention is reaching the intended users, how far they are engaging with it in the way that is believed to maximize effectiveness, and the observed mediating effects. Practical approaches to testing DBCIs are interviews with users (talking to users using a structured or semi-structured interview schedule), and randomized controlled trials using, if possible, an effectiveness comparator (so testing the DBCI against another DBCI or another type of

intervention to permit a judgment of relative effectiveness). We chose to use both techniques by implementing a cluster-randomized trial that tested the interventional platform, comparing it with the implementation of a control platform, questionnaires, and semi-structured interviews (as further described in part 4.1., 4.2, 5, and 6).

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**Implementing an online program to change
benzodiazepine prescription pattern**

4. Implementing an online program to change benzodiazepine prescription pattern

4.1. Manuscript 1: Implementing an online program to change benzodiazepine prescription: protocol of a hybrid type 1 cluster randomized trial

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Abstract

Introduction: Excessive benzodiazepine (BZD) prescription has long been considered a serious mental health concern in many countries. A large number of interventions using different methodologies have been implemented to change BZDs prescription patterns in primary health care settings, with limited positive results.

Objectives: The primary objective of our study was to analyse the effectiveness and implementation process of an intervention aimed at changing BZD prescription patterns in a primary health care setting in Portugal.

Methodology: We chose as methodology an effectiveness-implementation hybrid type 1 intervention. Our intervention was based on the development of an online platform, named ePrimaPrescribe, which was delivered using a Digital Behaviour Change Intervention (DBCI), using a two-arm cluster-randomised clinical trial.

Results: We primarily aimed to evaluate the effectiveness of our DBCI in changing BZD prescription patterns using the frequency of BZD prescriptions issued per month as an outcome measure. Secondly, we aimed to analyse the effect of ePrimaPrescribe on antidepressant prescriptions, to study the effect of the platform on diagnosis registration associated with BZDs and antidepressant prescription, and to perform a cost analysis considering the monthly National Health Service spending on BZDs co-payments. Finally, we aimed to analyse the implementation process using quantitative and qualitative methods.

Conclusion: With this study we expect to contribute with a cost-effective intervention to change the complex matter of excessive BZDs prescription, but also to improve insight into the challenges to intervention implementation processes in primary health care settings. We believe that our findings are relevant not only to the specific setting where the study was implemented but to all countries where primary health care plays a central role in care provision.

Introduction

Benzodiazepines (BZDs) are commonly used psychotropic drugs to treat insomnia and anxiety (1). Their long-term use is associated with considerable adverse effects (2), such as increased number of falls and bone fractures (2–4), a higher number of road accidents (2,5), and it has a possible role in inducing suicide (6–8). Numerous studies have shown that BZDs are still overprescribed and commonly used long-term (9,10), despite the existence of clinical guidance advising the use of non-pharmacological psychological treatments first-line, and to restricting BZDs prescription to a maximum of 8-12-weeks (11). Also, BZDs are often wrongly chosen to treat anxiety disorder symptoms, at expense of the adequate pharmacological treatment with antidepressants (12,13).

The consistently high prescription of BZDs in Portugal has been referenced in national and international publications over the last 20 years (14–16), with this fact being recognized as a sign

of inadequate management of mental disorders and considered a serious public health concern (17–19). Moreover, The Portuguese National Health Plan issued for 2012-2016 defined specific indicators to monitor the consumption regarding the outpatient consumption of antidepressants and also of anxiolytics, hypnotics and sedatives in the NHS, projecting a 50% reduction in the increasing prescription pattern, which was not verified (20). The 2020 review of this document set as goal to reverse the trend in the prescription of benzodiazepines in the population by stabilizing them (21), but recent data show a consistent increase in the consumption (22). It is also a documented fact that BZDs are mostly prescribed in primary health care settings, both in Portugal and internationally (23,24), pointing to the crucial necessity to implement interventions aimed at changing BZD prescription patterns in such settings.

A large number of interventions using different methodologies have been implemented to change BZDs prescription pattern in primary health care settings, such as minimal educational interventions (25–27), systematic discontinuation interventions (28,29), audit and feedback interventions (30), and policy interventions (31,32). The results are inconsistent; when positive, the effect is frequently lost after a short period and seems closely related to each country's primary healthcare setting's particular characteristics.

An educational outreach intervention previously implemented in Portugal had a small effect on BZDs prescribing trends and pointed out as a primary limitation the lack of staff to implement face-to-face educational sessions to a larger number of general practitioners (GPs) with adequate frequency (33). Online interventions, namely targeting behavioural change, with a low cost and high possibility of wide distribution, were considered a possible way to surpass limited time and resources in primary health care settings to implement an intervention of this nature.

BZDs prescription has been reported as a complex behaviour influenced by GPs' values, beliefs, attitudes and experiences, as well as patients' characteristics and demands (34–36). Therefore, besides the relevance of adequately implementing an intervention aimed at changing BZD prescription patterns, it is also crucial to gather information about the barriers to this implementation, and consider influencing factors such as acceptability, practicability, effectiveness, affordability and equity.

This study aimed to evaluate the impact of a Digital Behaviour Change Intervention (DBCI) in the form of a tailored online program called ePrimaPrescribe, in terms of changing BZDs prescription patterns and, at the same time, to test its implementation in a real-world situation.

Objectives

Main objective

To evaluate the effectiveness of a DBCI in a primary health care setting, in which GPs were given access to an online program, ePrimaPrescribe, aimed at reducing BZDs prescription.

Secondary objective

To analyse the effect of ePrimaPrescribe on antidepressant prescriptions.

To study the effect of ePrimaPrescribe on monthly registration distribution of psychological symptoms, complaints and diagnoses coded in the same month as BZD and antidepressant prescriptions. The aim was to verify if after the intervention implementation there was a more accurate choice of diagnosis coding associated with each prescription type.

To perform a cost analysis considering the monthly National Health Service (NHS) spending on BZD co-payments.

To analyse the implementation process using quantitative and qualitative methods.

Materials and Methods

Study design and setting

We chose an effectiveness-implementation hybrid design taking a dual focus a priori on assessing clinical effectiveness and implementation (37).

A hybrid type 1 study tests a clinical intervention, while gathering information on its delivery during the effectiveness trial, and its potential for implementation in a real-world situation. As the methodology for the intervention of our hybrid type 1 effectiveness-implementation trial, we choose a two-arm cluster-randomised clinical trial. The cluster design was selected because both the allocation and intervention were implemented at the health care unit level.

The setting for our intervention was primary health care units in the rural Central Alentejo region in Portugal, with an area of 7,393 km², with an estimated population of 166,706 inhabitants (2011), a population density of 22.5 inhabitants/km², and approximately 250 GPs working in primary

health care units. In Portugal, the NHS distinguishes two model types of primary care units. The default one is the ‘personalized care units’ model (UCSP), in which professionals receive a fixed salary. The other model is the ‘family health units’ model (USF), which enjoy higher functional and organizational autonomy (38), and where GPs might have a mixed payment scheme that includes salary, capitation, and pay for performance (39). Portugal has a public and accessible NHS, but mental health indicators are nevertheless alarming (16). BZDs’ prescription in Portugal is very high, as introduced in our background section, and the consumption of these drugs is particularly significant in the region where our intervention was implemented (17).

Eligibility criteria and recruitment

All primary healthcare units from the Central Alentejo region were considered eligible. We contacted each healthcare unit coordinator, explained the project, and invited their participation. The primary inclusion criteria were health care units where at least 90% of GPs agreed to participate in the study. We chose a higher acceptance rate than usually reported in the literature since we expected a significant number of GPs in each cluster, even though they had agreed to participate in the study, would not actively use the DBCI ePrimaPrescribe platform.

Sample size

The unit of observation for primary analysis was at the individual GP prescription level. Data collected from a previous research implemented in a similar setting (40) allowed us to perform an estimation for sample size (SS) calculation. We started by doing an SS calculation based on all observations’ independence and an effect size of 20% reduction. We obtained a total of N=58 participants, N=29 participants per study arm. To adjust for the intra-cluster correlation coefficient (ICC) (41), we then calculated the design effect (Deff) expressed as:

$$Deff = 1 + r(m-1), \text{ where } r \text{ denotes the ICC and } m \text{ is the size for each cluster.}$$

$$\text{Considering an average cluster of } m=5 \text{ and an ICC of } 0.02, Deff=1.08.$$

The SS adjusted for ICC was then be given by:

$$N^* = N(1 + r(m-1)),$$

$$\text{so } N^* = 29(1 + 0.02(5-1)) = 31.3 - \text{hence approximately } 32 \text{ per study arm.}$$

The number of clusters (k) was given by:

$$k = N(1 + r(m-1)) / m,$$

$$\text{so } k = 6.4E7$$

Considering an ICC of 0.02, a 1:1 ratio of allocation of controls per intervention unit, an alpha type error of 0.05, a cluster size of 5 doctors per unit, a minimal difference 20% reduction in the number of BZD prescriptions, the study would have to include 7 clusters per study arm to have an 80% power.

Random allocation

Randomization was stratified according to the organizational type of primary health care unit (UCSP vs. USF), the number of GPs per unit, the average number of appointments, and the number of patients per unit per month. We further included in our randomization criteria primary health care units' proximity to one another, meaning that when distinct units functioned in the same location/building, we allocated them to the same study arm.

In previous research, using similar baseline BZDs prescription data from primary health care units, there was a large spread of monthly BZD prescriptions (40). Since this spread was similar throughout different units, no stratified randomization (or matching for similar prescribing patterns) was considered necessary (42).

Health care units were included if 90% of the GPs agreed to participate. For concealment of allocation, after all eligible health care units has agreed to participate, we allocated them simultaneously to the intervention or control group using a computer-generated random number of tables. The distribution of participants after randomization is presented in Figure 2.

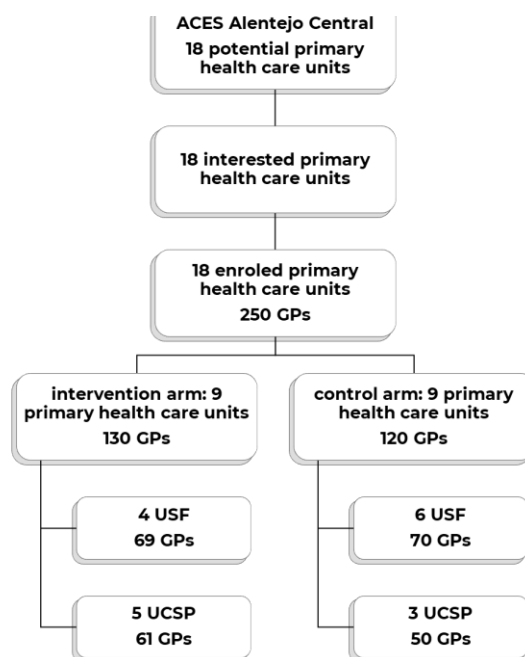


Figure 2. Distribution of participants after randomization.

Blinding

GPs could not be blinded since they were asked to participate actively in a study seeking to change their prescription practices. GPs included in both the intervention and control arms were asked to access an online platform. However, they were blinded to the existence of alternative content on the platform presented in their primary health care unit. The authors were not blinded to primary health care unit allocation.

The primary and secondary outcomes were assessed through analysis of the electronic prescription and diagnosis registration database for each GP. These data were extracted and anonymized (except for primary health care unit identification) by a data manager at the central Shared Services of the Portuguese Ministry of Health, who was not involved in the study and was blinded to participant allocation.

Intervention

Development of DBCI online programs

The DBCI online programs design was based on the Behaviour Changing Wheel theory (43), considering that behaviour change is key to improving healthcare and health outcomes. We used a DBCI mode of delivery. The ePrimaPrescribe program, designed to be implemented in the intervention group, was developed based on guidelines for anxiety and depression treatment and

BZD withdrawal. Our primary sources of information were the National Institute for Health and Care Excellence (NICE) guidelines (11), guidelines issued by the Portuguese National Health Directorate (44), and other relevant literature specifically addressing de-prescribing and evidence-based practice guidelines (45,46). The program comprised three e-learning modules, each of approximately 30 minutes' duration and with the following subjects: pharmacological effect and clinical use of BZDs; how to treat anxiety disorder avoiding the continuous use of BZDs; how to manage BZD dependence and BZD withdrawal proposals.

The primary health care units included in the control arm of our study were also offered an online platform, named ComunicaSaudeMental. This DBCI platform's content was developed based on literature concerning general communication techniques and more specific communication techniques for addressing light to moderate mental health disorders or patients' emotional management in primary health care settings (47). This program comprised (similarly to the one offered to the intervention arm) three e-learning modules, each of approximately 30 minutes.

After the development phase, modules were uploaded to two moodle platforms (one for the intervention educational platform, ePrimaPrescribe; another for the control educational platform, ComunicaSaudeMental), and an individual coded access was generated for each participant.

Before the implementation phase, both programs were tested by three GPs and three psychiatrists. Two of the GPs were members of the Primary Health Care Research Department at NOVA Medical School, and one was also a member of the Mental Health Research Department at NOVA Medical School. Two of the three psychiatrists were specialists in substance misuse. These experts were asked to comment critically on the accuracy and quality of the e-learning modules. Their suggestions were carefully considered, and when appropriate, were integrated into the module's final version.

Intervention implementation

We used as guidance to the following intervention implementation report, the Template for Intervention Description and Replication (TIDieR) checklist and guide (48).

The ePrimaPrescribe online platform was implemented in primary health care settings. A DBCI was chosen as the delivery method since we hypothesized that a free, easily accessible platform might have a higher and longer-term effect in terms of changing BZDs prescription patterns.

Primary health care units allocated to both the intervention and control arms had an initial face-to-face visit where we presented the online platform to the GPs, delivered their personal identification

access codes, and explained how to access and use the DBCI. Written informed consent was confirmed during this initial face-to-face visit. We performed all face-to-face visits to the allocated primary health care units within a six-week time frame.

We expected GPs to start accessing and hence actively participating in the study in the weeks following the first face-to-face visit to their unit. Access to the platform was available at any convenient time and frequency, through any digital device with internet connection.

We sent an email to GPs every three months, at three, six and nine months after implementation, as a reminder of their participation and as a strategy to improve adherence to the intervention. The platform was not tailored, personalized, adapted, or modified in any way during the intervention implementation period.

To assess how well the intervention was actually implemented, and hence to evaluate the extent to which the intervention was delivered as planned, we performed another face-to-face visit to all participating primary health care units 12 months after the initial intervention. During this visit, GPs included in the intervention arm were asked to answer a survey exploring their motivations and expectations regarding the use of the ePrimaPrescribe online program. They were also asked to complete a questionnaire evaluating the barriers and facilitating factors to the implementation of ePrimaPrescribe, and to participate in an exploratory group discussion on their general perceptions of their study participation and platform implementation.

All face-to-face visits, and hence explanation of the intervention procedures and monitoring, were conducted by the first author, who has a background as a psychiatrist and regularly performs her clinical work in the same geographical area where the intervention was implemented.

We performed semi-structured in-depth interviews with an intentional sample of participants from the intervention arm to explore perceptions on the feasibility and implementation of the study.

Outcome assessment

Primary outcome measure

As the primary outcome measure, we used the number of BZD prescriptions issued per month; specifically, the proportion of prescriptions issued by participants included in the intervention and control units over the study time frame, and more specifically at baseline, six and 12 months after intervention. We included BZDs from the following Anatomical Therapeutic Chemical classification system-coded groups: N05B, N05C and N03AE (49).

Secondary outcome measures

Effectiveness

As the secondary outcome measure, we used the number of antidepressant prescriptions issued per month; specifically, the proportion of prescriptions issued by participants included in the intervention and control units over the study time frame and more specifically at baseline, six and 12 months after intervention. We included antidepressants from the following Anatomical Therapeutic Chemical classification system-coded group: N06A (49).

To study the effect of ePrimaPrescribe on diagnosis registration, we used the monthly registration distribution of psychological symptoms, complaints and diagnoses coded in the same month as BZD and antidepressant prescriptions. The GP diagnosis registration used the International Classification of Primary Care, second edition (ICPC-2), developed and updated by the World Organization of Family Doctors' (WONCA) International Classification Committee (WICC) (50).

We further performed a cost analysis considering the monthly NHS spending on BZD co-payments. This cost was compared with the cost for implementing psychological interventions to treat anxiety and depressive disorders at primary health care settings.

Implementation

We studied the implementation process using quantitative and qualitative methods.

Quantitative data

We developed a standardised onsite survey aimed at exploring the following themes: GPs' self-evaluation of their knowledge about the management of patients with anxious and depressive symptomatology; their reasons for prescribing BZDs and antidepressants; their subjective assessment of the amount of BZDs and antidepressants prescribed; their reasons for continuing long-term BZD prescription; their difficulties in changing long-term BZD prescription; their degree of concern with continued BZD prescription; their knowledge of and degree of adequacy regarding the existing Portuguese guidelines on BZD prescription; their motivations and expectations regarding the use of the ePrimaPrescribe program in clinical practice; and their participation in the study. This questionnaire had 18 multiple choice questions and 14 short answer questions.

We adapted the Barriers and Facilitators Assessment Instrument (BaFAI)(51) to the implementation of the DBCI ePrimaPrescribe program. This questionnaire was organized into four categories: barriers deriving from the characteristics of the practice/innovation; barriers deriving

from the characteristics of the professionals; barriers due to patient characteristics; and barriers arising from the intervention context. The questionnaire had 25 questions using a five-point Likert scale.

We asked all participating GPs to complete the onsite survey and BaFAI questionnaires at the end-of-study face-to-face visit that was performed after completion of the twelve-month intervention period. During this visit, we also collected GPs' socio-demographic data.

Qualitative data

During our end-of-study face-to-face visit, we facilitated a group discussion in each primary health care unit included in the intervention group, to explore GPs' perceptions of their participation.

Finally, we performed semi-structured in-depth interviews with an intentional sample of participants from the intervention arm to explore perceptions of the study's feasibility and implementation. The interview guide structure was developed after an exploratory analysis of the themes emerging from the answers to the onsite survey questionnaire and the BaFAI, and from the group discussion during the end-of-study face-to-face visit.

Data management

Each prescription data was coded using an individual GP and patient numerical identification, in a secured and validated electronic database, directly extracted by the central Shared Services of the Portuguese Ministry of Health. Data concerning clinical diagnosis was extracted using the same method. Matching of the prescription and diagnosis databases was performed using the coded patients' numerical identification and prescription/diagnosis registration month.

Data obtained through questionnaires and interviews was collected after participants gave signed informed consent during the initial implementation face-to-face visit.

Data analysis

We performed an exploratory descriptive analysis using the number of prescriptions as the primary outcome measure, considering the patients' age and sex to be the main influencing factors, by units of intervention and control.

We performed most analysis at the level of intervention versus control clusters (so we compared the set of intervention units vs. the set of control units), since the available data did not allow for the author to identify each of the participating GPs, and hence also did not allow us to distinguish within the intervention units which GPs were compliant with the intervention (i.e. the GPs that

actually used the DBCI), and which, although they initially agreed to participate, ultimately did not use the platform.

We tested for significant differences among the baseline characteristics of the intervention and control groups. We performed descriptive analysis, with continuous variables summarised using means and standard deviations for normal distributions, and medians and the 25th and 75th percentiles for non-normal distributions.

Estimated effects were calculated by comparing the number of prescriptions in the intervention and control groups at baseline, six months and 12 months after intervention.

All analyses were performed on an 'intention-to-treat' basis (i.e., all initially enrolled GPs were included in the analysis according to the group to which they were assigned). This approach reduced the bias that may occur when participants not receiving assigned treatments are excluded from analysis.

We tested for significant differences in the baseline characteristics of the control and intervention groups using t-tests or one-way ANOVA. This included calculation of means and/or proportions with confidence intervals, and robust standard deviations (to account for clustering).

We performed a secondary analysis where we explored the association between the frequency of BZD and antidepressant prescription with diagnoses using Chi-Squared tests, to test independence in two-way contingency tables. The Cochran-Armitage trend test was employed to assess how the proportion of two ordinal successes varies across the levels of a binary variable. When both variables in a contingency table had ordered categories, the linear-by-linear test was used instead (52).

We finally performed a cost analysis considering the monthly NHS spending on BZD co-payments, using t-tests or one-way ANOVA.

Statistical significance was considered for p-values < 0.05.

The R statistical software (53,54) was used to perform all the statistical analyses within the RStudio integrated development environment for R, RStudio Team (2019). The graphs and plots were obtained with using the *ggplot2* R package (55).

We performed a descriptive analysis to correlate data from the onsite survey questionnaire and BaFAI questionnaire with GPs' sociodemographic characteristics using Chi-Squared tests for testing independence in two-way contingency tables.

We used qualitative methods, namely content analysis, to explore data from the in-depth interviews using ATLAS.ti (56). Interviews were coded, synthesized and categorized according to similarities of meaning (57,58). Patterns within and across categories were analyzed and grouped into themes. Categories and themes were driven by literature concerning the problematic of excessive BZDs prescription, on interventions to change prescription patterns, and on barriers and facilitators to such changes. Coding continued until no new concepts emerged from the data. Coding, category-building procedures and thematic analysis were discussed by the authors until consensus was reached.

Data was reported elsewhere according to the 2010 Consolidated Standards of Reporting Trials guidelines.

Discussion/Conclusion

Strengths and limitations

The concerning reality of excessive BZD prescription in Portugal (14–16) suggests the need for effective interventions, at minimal cost and with a low need for professional time. A maximally effective withdrawal strategy is especially important in primary care settings because of budgetary limitations and the small amount of GP time available per consultation (59).

BZD prescription is considered a complex behaviour (34–36). Behaviour change is key to improving health care and health outcomes (60). Therefore, we chose to design our intervention based on a behaviour change theory, the Behaviour Changing Wheel theory (43), in the hope that using a validated and reviewed framework would strengthen the quality of our approach.

Concerning our effectiveness trial, this paper describes the protocol for a cluster-randomised trial to assess, primarily, whether a DBCI would have a significant effect on BZD prescription. It also describes two secondary analyses regarding antidepressant prescription trends and reporting of diagnosis registrations associated with BZD prescription, in the hope that the implementation of our DBCI could also translate into improved anxiety disorder registration and adequate treatment (with an increase in antidepressant prescription).

Randomized trials are the gold standard to assess intervention effects, and cluster-randomised trials are an appropriate design when interventions need to be introduced to groups of individuals (in

our case, groups of GPs prescribing in the same primary health care unit), which are randomly allocated to different study arms (41,61).

We chose a DBCI as the delivery method because these online interventions have the potential for low unit costs, high reach, and may be an effective and acceptable way to benefit individuals and society (62).

We chose to include both prescription-related outcomes and diagnosis outcomes. We recognise the limitation of presenting our prescription-related outcomes as the frequency of prescription. In fact, it was our intention to use the World Health Organization recommended outcome measure, Defined Daily Dosage (DDD) per 1000 inhabitants per day (DHD), which provides a measure of exposure or therapeutic intensity in a defined population, allowing comparisons across various time periods and population groups, however, the database provided by the Shared Services of the Portuguese Ministry of Health did not allow for such analysis. Notwithstanding, in the specific case of BZDs in Portugal, we consider this limitation was minimised by the fact that BZDs' prescriptions cannot be placed in chronic repeated prescriptions. This means that when a BZD prescription is issued, it has to be dispensed in the next 30 days, and that each prescription can have a maximum of two packages of the drug. Hence, since there is the need for frequent prescription renewal, we considered that the number of prescriptions issued was an adequate measure to estimate our intervention effect.

Regarding clinical diagnosis outcomes, we recognise that our data might reflect our fairly inexact approach, since most prescriptions are not associated with psychological symptoms, complaints or diagnoses registration, and also because even when this association was found, it did not mean that symptoms or disorders were identified at the moment of prescription. In Portugal it is not mandatory to perform a complaint/symptom/diagnosis coding each time a GP issues a prescription. The registration tool available in the Portuguese primary health care units allow GPs to code just once a certain diagnose and keep it associated with the patient file, hence dismissing further need to repeat the diagnosis coding, no matter how long the treatment for that disorder is kept. Despite this limitation, we considered it relevant to report our analysis of changes in clinical diagnosis, since it might indicate significant secondary effects coming from the intervention implementation.

We recruited GPs to participate, taking into account all the available characteristics that might influence our primary and secondary outcomes: sex, years of clinical experience, type of primary health care unit and previous training in mental health.

We recognise as a limitation and possible bias the fact that it was the first author who was mainly responsible for implementation, and at the same time responsible for collecting data from the questionnaires and in-depth interviews. We minimised this limitation by having all data, including its categorisation, content and theme identification, reviewed by a researcher who was not involved in data collection.

Relationship to other studies and expected contribution

Excessive BZD prescription is a reality for many countries other than Portugal. For this reason, a large body of evidence already exists, with extended research assessing the effectiveness of interventions aimed at changing BZD prescription patterns. From simple methodologies, such as sending letters to long-term BZD users, to more complex ones, such as multi-step tailored interventions, most studies show limited short-term effects. Most studies also lack a more profound understanding of the facilitators and barriers to implementation.

We consider our trial to be innovative since it presents a methodology that was carefully prepared to reach a maximum effectiveness, at minimal cost and with a low need for professional time, and it also has an important focus on factors influencing implementation. We also consider our research to be of particular national interest, because no matter how well structured an intervention might be, if it is not accepted by the public for whom it is designed then the results will inevitably be limited.

In dedicating a significant effort to explore GPs' perceptions of their participation experience, we expect to contribute to two important areas of knowledge. On the one hand, to a better understanding of the factors influencing the act of BZD prescription, and possibly in a larger perspective, what this prescription means/represents in the management of mental health issues in primary health care settings. On the other hand, in a time and setting where online interventions are becoming more common, we aim to explore the factors influencing the acceptance and practicability of our DBCI. Concerning this mode of delivery specifically, we also expect our research to contribute to an in-depth exploration of perceptions that are liable to be applicable in other areas besides mental health, and hence it could help to shape digital interventions according to what GPs want – and thus they will feel more motivated to comply.

Statements

Acknowledgement

We would like to thank Ricardo Vicente e Cátia Pinto from SPSM services for facilitating access to data extraction; all of the coordinators of the primary health care units in Alentejo central region for facilitating the study implementation; and all the GPs who willingly participated in the study and openly shared their perspectives.

Statement of Ethics

This trial was approved by the Ethics Commission for Health of the Regional Administration of Health for Alentejo Region (Portugal) (02/2016(CES) and the Nova Medical School, Nova University Lisbon, Portugal Ethics Commission (47/2016/CEFCM). The results of this study were disseminated via peer-reviewed publications and conference presentations. All data will be available on request.

Trial registration

ClinicalTrials.gov number NCT04925596

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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4.2. Manuscript 2: Implementing an online program to change benzodiazepine prescription in Portugal: a cluster randomized trial

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Abstract

Background: The excessive prescription of Benzodiazepines (BZDs) has long been considered a worldwide public health issue. Despite the existence of a large body of literature regarding interventions to change BZDs prescription patterns, most fail to report significant or long-term effects.

Objective: To study the effect of the implementation of a Digital Behaviour Change Intervention (DBCI) online platform - named ePrimaPrescribe - on BZDs prescription pattern. Secondly, to determine the effect of the platform implementation on diagnosis registration coded in the same months as BZDs prescription and the costs for the NHS with co-payment.

Methods: We followed a cluster-randomised design to allocate 18 primary health care units, from a region in Portugal. The study included BZDs prescriptions from 250 General Practitioners (GPs) for a period of 12 months before and after intervention implementation.

Results: BZDs were more frequently prescribed to elders and females. The most frequently prescribed BZD was alprazolam. Most prescribed BZDs had a medium half-life. In most analysis we did not find any significant change in BZDs prescription pattern. Regarding secondary outcomes, depressive disorder was the first, anxiety disorder the second and dementia the fifth most frequently registered diagnosis associated with BZD prescription. BZDs' co-payment represented an average expenditure of approximately 1300€ per unit per month.

Conclusion: We could not find any significant difference in BZDs prescription pattern after ePrimaPrescribe implementation. Further work is required to explore the factors influencing resistance to changing BZDs prescription pattern.

Background

Benzodiazepines (BZDs) are extensively used to treat anxiety, sleep disorders and as muscle relaxants (1,2). BZDs continuous utilization has been strongly associated with increased number of falls and bone fractures (3–5), a higher number of road accidents (4,6), and possible role in inducing the phenomenon of suicide (7–9). Although with a weaker evidence, BZDs use has also been related with cognitive decline and dementia (10–12) and increased mortality risk (13). Although national and international clinical guidelines recommend limiting the duration of BZD treatment to only a few weeks, the prevalence of long-term use remains widespread.

In 2015, Portugal was the OECD country with the highest reported consumption of BZDs, with 114 Defined Daily Doses pr 1000 inhabitants (DHD) in 2015 versus 87 DHD in Spain and 16 DHD in the United Kingdom. In this same year it was reported that there were 1.9 million users who received at least one BZD prescription or similar (14). The most recent data published by the Portuguese National Authority of Medicines and Health Products (INFARMED) reported that anxiolytics, sedatives and hypnotics were the fourth most used therapeutic class, with over 10million packages sold in 2019 (15). BZDs' users were mostly female (70%), aged between 55 and 79 years old, and the proportion of the Portuguese population that used these drugs increased with age, corresponding to more than half of the residents in Portugal of female gender aged 85 or over (14).

The excessive BZDs prescription pattern has long been recognized a public health concern, and many interventions using multiple strategies have been implemented to reduce the extent of BZDs usage. Simple interventions include minimal educational interventions (16–18), audit and feedback interventions (19) and policy interventions (20,21). More complex interventions include tailored systematic discontinuation interventions (22,23). Results from previous studies are varied and usually small, with loss of effect after a short-term period.

Since approximately 80% of BZDs prescriptions are issued by general practitioners (GPs) (14), changing prescription pattern in the primary health care setting should be a priority.

GPs have limited time for consultations with each patient and often encounter difficulties in managing withdrawal. Therefore, efforts should be made to develop feasible, evidence-based, effective and expeditious interventions that can be easily implemented in primary care settings (24).

This study assessed the efficacy of a Digital Behaviour Change Intervention (DBCI) online platform - named ePrimaPrescribe - to change BZDs prescription pattern. Secondly we aimed to determine if the ePrimaPrescribe online program was associated with a change in diagnoses registration, and to perform a cost analysis for the National Health Service expenditure with BZDs' co-payment.

Methods

We followed CONSORT guidelines for the analysis of cluster-randomized trials and for the presentation of our results.

Trial design and setting

We choose to perform a non-blind, cluster-randomised controlled trial.

We choose a cluster design aiming to reduce potential contamination of the intervention between trial arms and prevent the effects of the training influencing untrained GPs.

The setting for our intervention was primary health care units at a rural region in Portugal, with an area of 7393 km², with an estimated population of 166.706 inhabitants (2011), a population density of 22.5 inhab./km², and approximately 250 GPs working in primary health care units.

Portugal has a public accessible national health service, but mental health indicators are alarming (25). BZDs prescription in Portugal is very high, as introduced in our background section, and the consumption of these drugs is particularly significant in the region where our intervention was implemented (26).

Participants

In Portugal, the National Health Service (NHS) distinguishes two types of primary care units. The default one is the ‘personalized care units’ model (UCSP), in which professionals receive a fixed salary. The other model is the ‘family health units’ (USF), which enjoy higher functional and organizational autonomy (27), and where GPs might have a mixed payment scheme that includes salary, capitation, and pay for performance (28). We included primary health care units from the two main existing types in Portugal - ‘personalized care units’ (UCSP); ‘family health units’ (USF), since different types of organizational characteristics were considered to possibly influence both intervention acceptability and GPs performance.

We considered eligible for inclusion GPs identified as being continuously prescribing BZDs, using an online prescription tool that is available in all Portuguese NHS primary health care units during the period of analysis.

At the initial intervention onsite visit, a participant information sheet was distributed, and GPs were given the opportunity to ask questions about the study. The informed consent was subsequently distributed and signed both by the participants and the author.

Intervention

Our intervention was developed using as background the Behavioural Changing Wheel theoretical framework (29). We choose to deliver our intervention as a Digital Behaviour Change Intervention (DBCI) (30) considering that an online platform, free and available at user’s convenience, using education, persuasion, training, restriction, modelling and enablement as intervention functions would increase its affordability, practicability, effectiveness and acceptability.

The content of the ePrimaPrescribe DBCI was developed based on guidelines for anxiety and depression treatment and BZDs withdrawal. Our primary source of information were National Institute for Health and Care Excellence (NICE) guidelines (31), guidelines issued by the

Portuguese National Health Directorate (DGS) (32), and other relevant literature specifically addressing deprescribing evidence-based practice guidelines (33,34).

The program comprised three e-learning modules, each with approximately 30 minutes of duration and with the following subjects: pharmacological effect and clinical use of BZDs; how to treat anxiety disorder avoiding the continuous use of BZDs; how to manage BZDs dependence and BZDs withdrawal proposals.

We developed an alternative DBCI, ComunicaSaudeMental, that was delivered to GPs practicing at primary health care units included in the control intervention arm with similar module's number and duration. The content of this platform focused communication techniques for addressing light to moderate mental health disorders or patient's emotional management at primary health care settings.

The program was delivered at an initial face-to-face onsite visit performed in every primary health care unit by a psychiatry specialist, with clinical practice in the same geographical area where the intervention occurred. A second face-to-face onsite visit was performed at the end of intervention period (12 months after implementation), to gather data concerning implementation evaluation process, through questionnaires and in-depth interviews, which are described in the next sections.

GPs agreeing to participate, and after signing the informed consent, were given an individual password to access ePrimaPrescribe or alternatively the platform ComunicaSaudeMental, and an individual identification code which related anonymously to data gathered in interviews, questionnaires, and program utilisation.

The utilisation of the online platforms was evaluated in terms of a dichotomization of “access” or “no access” to the platform over the total period of time of the study.

An email was sent every three months to each GP as reminder for participation.

Data collection

Data were directly extracted, delivered, and monitored by the Portuguese Shared Services of Ministry of Health, and were detailed so each entry on the database corresponded to a prescription issued to an observed patient.

Outcomes were assessed for a period of 12 months before and after intervention to investigate whether the ePrimaPrescribe online training was associated with sustained change in BZDs prescribing patterns.

The following variables were associated to each prescription: regarding the patient's characteristics: random identification number (unique to each patient), age, sex, and diagnoses; regarding prescriber's characteristics: random identification number (unique to each GP and associated to each prescription); regarding primary health care unit's characteristics: name and unique identification code; type of primary health care unit (USF vs UCSP); regarding details concerning BZDs and antidepressant prescription: year and month of each prescription, and cost for the National Health Service with BZDs co-payment.

Sample size

Data collected from previous research (35) allowed performing estimation for sample size (SS) calculation. The SS calculation initially considered observation's independence and an expected effect size of 20% reduction. We adjusted for the intra-cluster correlation coefficient to obtain a design effect with an 80% power.

Considering a 1:1 ratio of allocation of controls per intervention unit, an alpha type error of 0.05, a cluster size of five GPs per unit, a minimal difference 20% reduction in the number of BZDs prescriptions, we obtained that the study would have to include seven clusters per study arm in order to have an 80% power.

Randomization

Units' randomization was performed considering the following data: type of primary care unit (UCSP vs USF); number of GPs per units; average number of appointments and number of patients per unit per month, and the proximity of primary health care units. These characteristics were considered because it was expected that unit's similar organizational and performance characteristics would significantly influence our study results.

Regarding a total of 18 potentially eligible primary health care units, all agreeing to participate in the study, and considering the referred characteristics, nine units were randomised for the intervention group (corresponding to a sample of 58 doctors) and nine units were randomised for

the control group (corresponding to a sample of 52 doctors) (Additional file 1). We considered this sample fulfilled criteria for significance and power for study's results.

Primary health care unit allocation was not blinded to the authors.

Non-blinding of the author was minimized by the fact that primary outcome data were directly extracted from the prescription database with coded data entry and blinding of the Shared Services of the Portuguese Ministry of Health data manager.

Outcomes

Primary outcome measure

We used as primary outcome measure the frequency of BZDs prescriptions issued per month, the proportion of prescriptions issued by GPs included in intervention and control units over the study time frame, and more specifically at baseline, six and 12 months after intervention.

We included BZDs from the following Anatomical Therapeutic Chemical classification system-coded groups: N05B; N05C and N03AE.

Secondary outcome measures

To study the effect of ePrimaprescribe on diagnoses registration, we used the monthly registration of psychological symptoms, complaints, and disorders, coded at the same month as BZDs prescriptions. The GP's diagnosis registration used the International Classification of Primary Care, second edition (ICPC-2) developed and updated by the World Organization of Family Doctors' (WONCA) International Classification Committee (WICC).

We further performed a cost analysis considering the monthly National Health Service spending with BZDs co-payment.

Statistical Methods

Most analyses were performed at the level of intervention versus control clusters. Analyses were performed on an intention-to-treat basis (i.e., all initially enrolled GPs were included in the analysis according to the group to which they were assigned).

We performed an exploratory descriptive analysis using the number of prescriptions as the primary measure of outcome, considering as main influencing factors the patient's age and sex, by units of intervention and control.

We tested for significant differences among the baseline characteristics of the intervention and control group. We performed descriptive analysis, with continuous variables summarised using means and standard deviations for normal distributions, and by medians and the 25th and 75th percentiles for non-normal distributions.

Estimated effects were calculated by comparing number of prescriptions in the intervention and control groups at baseline, six months, and 12 months after intervention.

We tested for significant differences in the baseline characteristics of the control and intervention groups using t-tests or one-way ANOVA. These included calculation of means and/or proportions with Confidence Intervals (Cis), and on robust Standard Deviations (SDs) (to account for clustering).

We performed a secondary analysis where we explored the association between the frequency of BZDs with diagnoses using Chi-Squared tests for testing independence in two-way contingency tables. The Cochran-Armitage trend test was employed to assess how the proportion of two ordinal successes varies across the levels of a binary variable. And when both variables in a contingency table had ordered categories, the linear-by-linear test was used instead (36).

We finally performed a cost analysis considering the monthly National Health Service spending with BZDs co-payment, using t-tests or one-way ANOVA.

Statistical significance was considered for p-values < 0.05 .

The R statistical software (37,38) was used to perform all the statistical analyses within the RStudio integrated development environment for R, RStudio Team (2019). The graphs and plots were obtained with use of the *ggplot2* R package (39).

Results

Delivery of intervention and participant's characteristics

All 18 eligible primary health care units agreed to participate in the study.

These 18 units were randomly allocated, considering specific matching characteristics as previously mentioned, to receive the DBCI ePrimaPrescribe online program or to receive the ComunicaSaudeMental online program containing basic information on care and communication skills with patients suffering from mild and moderate mental disorders.

Of the total 250 GPs whose prescriptions were analysed, 130 were included in the intervention group and 120 were included in the control group. Prescribers included in the intervention group were distributed by four USFs, with 69 GPs; and five UCSPs with 61 GPs. Prescribers included in the control group were distributed by six USFs, with 70 GPs; and three UCSPs with 50 GPs.

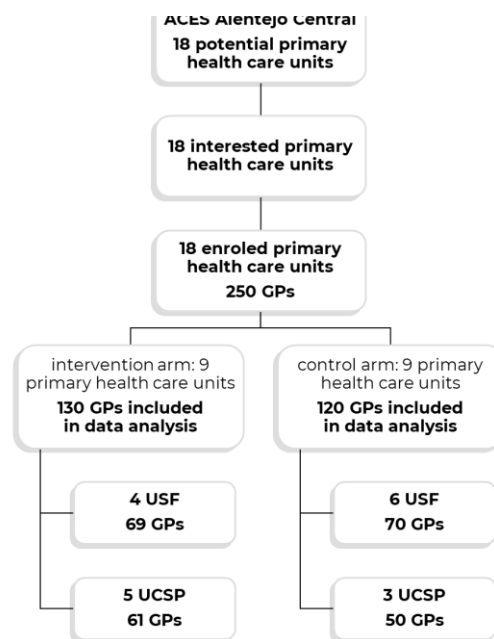


Figure 3. Flowchart of GPs included in data analysis.

The intervention was then delivered to 110 GPs. Fifty-eight GPs prescribed at primary health care units allocated to the intervention group, and 52 GPs prescribed at primary health care units allocated to the control group. At the initial moment of implementation, six doctors in the intervention group and five doctors in the control group did not agree to participate. Throughout the study period, there were five dropouts in the intervention group (one due to death) and 1 dropout in the control group.

We assessed ePrimaPrescribe utilization through dichotomization of “access” or “no access” to the platform over the total period of the study. At units included in the intervention group, we verified that 27 doctors used the platform, therefore with a platform utilization rate of 57 % of the total of 47 physicians who completed study participation. At units included in the control group, 23 physicians used the platform, hence with a platform utilization rate of 50% of the total of 46 physicians who completed study participation (Figure 4).

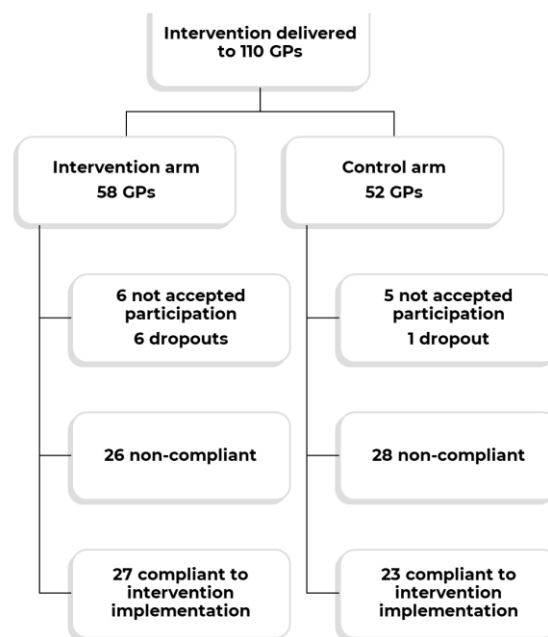


Figure 4. Flow of GPs compliant to intervention.

Primary outcomes

Characteristics of patients with BZDs prescription

At baseline, patients' average age was 67.3 years old at intervention group and 67 years old at control group. The age, either at intervention ($p=0.383$) or control group ($p=0.269$), did not change significantly at six and 12 months after the intervention, nor between intervention and control group also did not differ significantly ($p=0.159$) (Table 9).

When specifically addressing age categories, we found that BZDs were more frequently prescribed to older patients both at intervention and control group. Twelve months after intervention implementation, the prescription increased (but not significantly $p=0.164$) for patients over 65 years old. The proportions of prescriptions for <65 and >65 does not seem to increase or decrease with time ($p\text{-value} = 0.184$) (Additional file 2).

BZDs were more frequently prescribed to females, either at baseline (73.5%), six months (75.7%) and 12 months after intervention implementation (73.3%). The frequency of prescription to females did not change significantly at different points in time within and between intervention and control group ($p=0.499$). The proportions of prescriptions for males and females did not seem to increase or decrease with time when specifically testing for the intervention group ($p=0.304$) (Additional file 2).

BZDs prescription characteristics

Concerning BZDs prescription by type of primary health care unit, the proportions of prescriptions at USCPs units included in the intervention group decreased significantly with time (the Cochran-Armitage test supports the trend hypothesis ($p\text{-value} < 0.001$)). The proportions of prescriptions at USF type units included in the control group also decreased significantly with time (Cochran-Armitage test with a $p\text{-value} < 0.001$) (Figure 5 and Additional file 3).

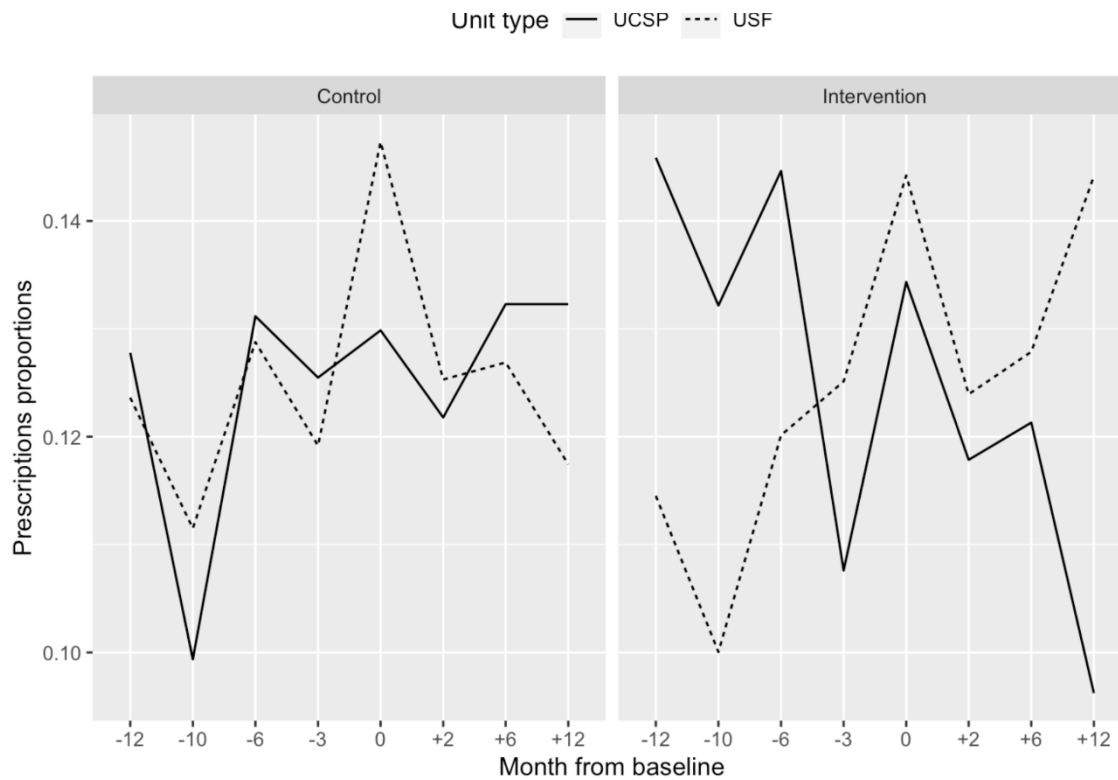


Figure 5. Prescription proportion of BZDs at intervention and control units distributed by type of primary health care unit.

A more specific analysis, comparing prescription to patients over and under 65 years old by type of primary health care unit, shows a slightly more pronounced decrease in the first 6 months after the intervention in younger users both at UCSP and USF unit types (Figure 6).

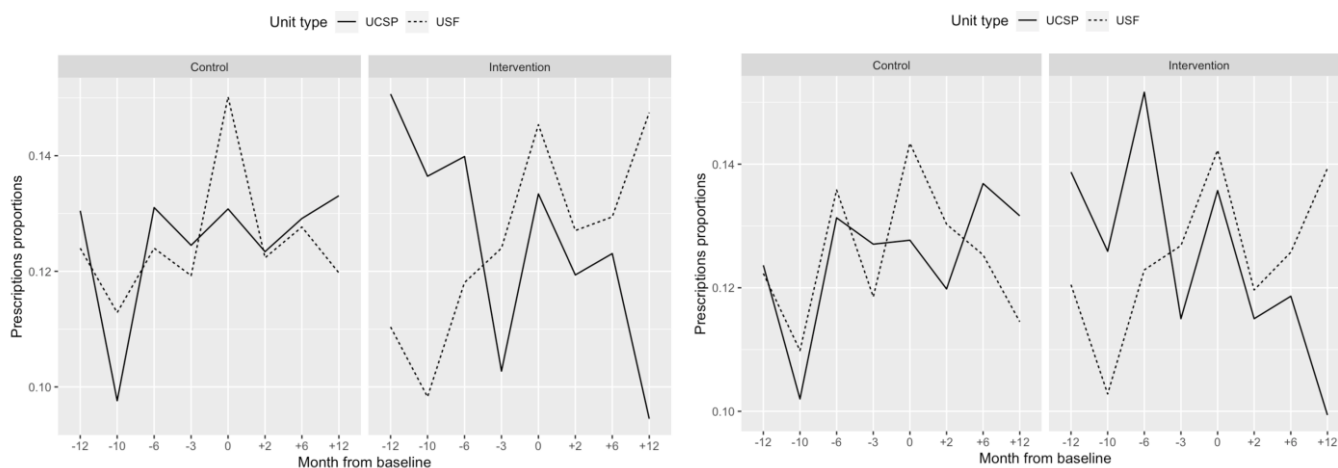


Figure 6. BZD prescription to patients over 65 years old compared with BZD prescription to patients under 65 years old.

Regarding the most frequently prescribed BZDs active pharmaceutical ingredients, alprazolam, was the most frequently prescribed drug, varying between 20.9% to 24.3%. Alprazolam prescription increased at 12 months after intervention implementation. We found that the distributions of the active pharmaceutical ingredients prescribed in the intervention group differed over time (Chi-square test of homogeneity $p=0.025$), which didn't happen to prescription issued at units included in the control group (Chi-square test of homogeneity $p=0.158$) (Figure 7 and Additional file 4).

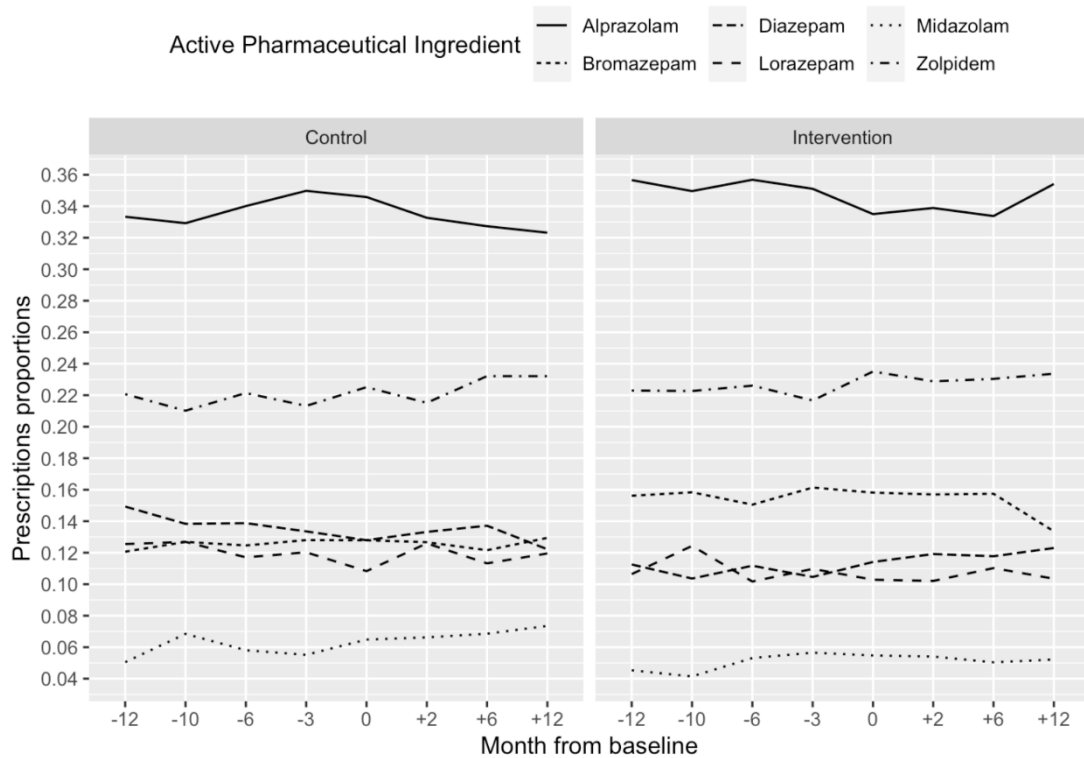


Figure 7. Prescription proportion by active pharmaceutical ingredients

A more specific analysis, regarding prescription by active pharmaceutical ingredient to patients over 65 years old, shows that alprazolam was still the most frequently prescribed. The trend for midazolam prescription also did not change in this specific analysis (Additional file 5).

When specifically considering prescription by active pharmaceutical ingredient to females, the prescription trend does not change over time, hence intervention implementation does not seem to have any effect in prescription trend (Additional file 6).

Regarding BZDs prescription by drug half-life, it was verified that most prescribed BZDs had a medium half-life, and the second most prescribed were BZDs with short half-live. After a linear-by-linear association test was applied we found there was no evidence of a significant change in prescription trend for BZDs half-life with time in the intervention group ($p=0.896$) (Additional file 7).

Secondary outcomes

Diagnosis registration coded in the same month as BZDs prescription

To perform the following analysis, we used a database with all diagnosis that were coded during our study time frame.

Diagnosis included in this secondary analysis are detailed in Additional file 8.

During the time of interest for our research (12 months before to 12 months after intervention implementation), 9,348 mental health complaints/diagnosis were coded to patients with BZDs prescriptions.

Depressive disorder (P76) was the diagnosis more frequently coded both at intervention and control group, at baseline, 6 months after intervention and 12 months after intervention (between 28.6 and 42.3% of the six most frequently coded diagnosis). It was followed by anxiety disorder/anxiety state (P74) (between 12.5 and 35.6% of the six most frequently coded diagnosis). Sleep disturbance (P06) was the third most frequent coded diagnosis (between 3.3 and 26.8% of the six most frequently coded diagnosis). Dementia (P70) was the fifth most frequent diagnosis coded in the same month as BZDs prescription (between 4.3 and 20.6% of the six most frequently coded diagnosis). There is evidence that the distributions of the diagnosis differ over time, both at intervention ($p=0.007$) and control group ($p<0.001$). We could not find a significant decrease of depressive disorder (P76), anxiety disorder/anxiety state (P74), sleep disturbance (P06) or dementia (P70) diagnosis, in the intervention group after intervention implementation (Additional file 9).

Costs for NHS with BZDs' co-payment

Concerning costs for the NHS with BZDs' co-payment, the total for the 18 units included in the study in each of the analysed month was over 23,000€, meaning an average of approximately 1,300€ per unit per month. There was a significant difference between costs at intervention and control group (Welch Two Sample t-test with $p<0.001$), however this difference might be attributed to the large number of prescriptions included in our database, since the actual value difference was less than 0.01€. There was no significant change in the cost for NHS with BZD co-payment neither at intervention units ($p=0.331$), nor at control units ($p=0.162$) throughout the time the study occurred.

Table 9. Costs for the NHS with BZD co-payment.

	Baseline		6 months after intervention		12 months after intervention	
	Intervention	Control	Intervention	Control	Intervention	Control
Costs for BZD NHS payment (€)	13.979	12.645	12.374	11.246	11.940	10.738

Significance (IC 95%): $p = <0.001$, CI: (0.081-0.099). $p_{intervention}=0.331$, $p_{control}=0.162$.

Discussion

Our study included the analysis of BZDs prescription trend issued by all prescribing GPs in a region of Portugal for the period of 12 months before and after implementation of a Digital Behaviour Change Intervention. In the literature, it is more common to find reports with data coming from BZDs sales or consumption (14,15). Notwithstanding, we chose to use prescription data as our main primary and secondary outcomes since our study aimed to specifically analyse the change in prescription trend. Also, in the specific case of BZDs, due to its low price, effectiveness in immediate symptom relief and high dependence potential, the figures for prescription and consumption are probably approximate.

Primary outcomes

BZDs were prescribed more frequently to patients over 65 years old at baseline. We found a slight increase in prescription trend to patients over 65 years old after intervention implementation, although this trend change was not significant. We also found that average age was over 67 years old, both at baseline and 12 months after intervention, and a similar average age (67 years old) was found at control group. These findings are similar to what is found in other studies (40–43), and can be explained by the higher prevalence of insomnia, anxiety disorders and organic conditions elders present, together with a more frequent demand for medical attention (41). BZDs prescription should be avoided at older ages considering its secondary effects such as increased number of falls and bone fractures (3–5), cognitive decline and dementia (10–12). These recommendations were highlighted at ePrimaPrescribe program modules' content, hence we expected a positive effect coming from the program's implementation, with a decrease in prescription, which was not observed. Our analysis comparing prescriptions to patients over and under 65 years old by primary health care unit type, showing a slight decrease in prescription frequency to younger patients in the first 6 months after intervention, further suggests a greater

difficulty in changing BZD prescription to older patients. The slight increase in prescription trend to patients over 65 years old, observed in primary health care units included in the intervention group, should be the target of worrisome consideration, since it goes on the opposite sense of what was intended with our intervention.

BZDs were more frequently prescribed to females at baseline, and 12 months after intervention implementation. We did not find any significant change in prescription trend either between different time points or between intervention and control group. The higher prescription to females that we found in our study agrees with previous published research (40,41). There could be various explanations to this finding: most epidemiological studies in the community show a prevalence of psychiatric disorders which is two to three times higher in women than in men (25,44); differences in access to the health system, since women tend to consult more frequently with their doctors than do men; differences in symptoms presentation, since women might present anxiety and depressive disorders with complaints which are easier for GPs to interpret and identify; and different approaches from the health professional (45).

We performed a specific analysis which considered the effect of our intervention implementation by primary health care unit type. This analysis reported a significant decrease in the proportion of BZDs prescribed at UCSPs included in the intervention group, but also a significant decrease in USF primary health care units type included in the control group. Hence, despite it has been reported that primary health care unit organization might influence prescription outcomes (46), we did not find any significant difference in the prescription trend of UCSPs or USFs. We might hypothesize that these data are related with the fact that, in Portugal, the only performance indicator for USF primary health care unit type, aiming to limit BZDs prescription, is rarely contracted, hence there is no special incentive for GPs prescribing at USFs to behave differently than GPs prescribing at UCSPs.

We found that the most frequently prescribed active pharmaceutical ingredients – alprazolam, zolpidem, bromazepam and diazepam – accounted for approximately half the total prescriptions, and this trend did not change with intervention implementation. The active pharmaceutical ingredients prescription frequency are in agreement with national and international reports (15,41,47). We performed a specific analysis to the most frequently prescribed pharmaceutical ingredients prescribed to patients over 65 years old and alprazolam was still the most frequently prescribed. In this specific analysis we also confirmed that midazolam, a BZD with a very short-acting half-life, highly addictive, and for that reason advised to be avoided as outpatient's prescription, especially to older patients, represented 3.6% of total prescription. Furthermore, our

analysis to BZDs prescription by BZD half-life demonstrated that BZDs with a short-half life were the second most prescribed group, with a slight increase after intervention implementation. These findings, once again on the opposite sense of our intervention purpose, should be a matter of concern.

Secondary outcomes

Our analysis concerning diagnosis registration at the same month of BZDs prescription aimed to explore the association of the most frequently coded diagnosis to patients using BZDs. The finding that depressive disorder was the diagnosis more frequently coded both at intervention and control group and that sleep disturbance and dementia were respectively the third and fifth most frequent coded diagnosis, despite a non-surprising result, should be considered with a high degree of concern. BZDs prescription is not the recommended treatment for depressive disorder, however during the initial phases of antidepressant treatment, BZDs are often prescribed as a coadjuvant if anxiety, agitation and/or insomnia. Despite a previous study showed that about 30% of patients were initially prescribed with BZDs for a depressive disorder (23), these patients should be treated with the BZD for no longer than 2 weeks to prevent the development of dependence, but, once initiated, BZDs prescription is often maintained for longer. BZDs prescription should be avoided in dementia due to its documented association with cognitive impairment and falls.

In Portugal it is not mandatory to perform a diagnosis coding each time a GP issues a prescription. The registration tool available in the Portuguese primary health care units allow GPs to code just once a certain diagnose and keep it associated with the patient file, hence dismissing further need to repeat the diagnosis coding, no matter how long the treatment for that disorder is kept. Notwithstanding, our results concerning diagnosis coding agreed with the literature, suggesting that BZDs prescriptions are often issued to inadequate clinical situations, and in agreement with our effectiveness trial results, showing the lack of effect from our intervention to change diagnosis identification.

We finally performed a cost analysis regarding costs for the NHS with BZDs' co-payment, which showed no difference between intervention and control units, or any significant change through our intervention implementation time frame. In the region where our study was implemented, in 2021, there were only 8 psychologists working full-time and other three working part-time in the total 18 units included in our study. Despite the suspension of BZDs co-payment did not show significant positive impact on BZDs prescription in other countries (20), the saving coming from this suspension could contribute to improving the access and quality of care in the Portuguese

primary health care setting. For instance, we verified that the suspension of co-payment in Portugal would represent a monthly saving of around 23.000€, which would be enough to hire at least one psychologist for each unit in the intervention region.

Strengths and limitations

Most published studies concerning interventions to improve the prescription of BZDs rely upon voluntary participation, often resulting in the participation of GPs who prescribe BZDs more rationally (48) or are especially motivated to change their prescription pattern. Although our study relied on GPs voluntary participation, since the program was presented and accepted by all unit coordinators, most GPs prescribing in the region were included. We believe this contributed to the quality of our data, shown by the heterogeneity of the BZDs quantity prescribed, including all types of prescribers (not selecting the ones who prescribe more rationally).

We recognize the potential influence of a very significant number of non-compliant GPs to platform utilization. From the total prescribing GPs considered in our analysis, 103 included in the intervention group and 97 included in the control group, a significant number did not use the platform, corresponding to 79% of total number of GPs included in the intervention group and 80% of the total number of GPs included in the control group. Despite this fact, no change in the design of the study was performed, considering the importance of maintaining the methodological coherence selected (cluster randomization), and the probable contamination of GPs who did not access the platform by those who did (therefore their individual results are not equivalent to those of the participants in the control group).

We performed most analysis at the level of primary health care unit and comparing intervened vs control groups since the available data did not allow identifying each of the participating GP, so not allowing to distinguish in the intervention units, which GPs were compliant with the intervention (so the GPs that actually used the DBCI ePrimaPrescribe Platform complying with the intervention), from those that, although initially agreeing to participate, finally did not use the platform.

Regarding clinical diagnosis outcomes, we recognize that our data might be a fairly inexact approach, since most prescriptions are not associated with a diagnosis, and also because even when this association was found, it didn't mean that symptoms or disorders were identified at the moment of prescription. Despite this limitation, we considered relevant to report the analysis of

the change in clinical diagnosis, since it might indicate significant secondary effects coming from the intervention implementation.

As a strengths to our research, we included prescription from all GPs and patients from one region in Portugal for a 24-month time. The large patient sample size and large number of participating GPs, together with the small average cluster size, provided this study with sufficient power to detect small differences between groups. However, as our inclusion criteria was very broad – including all BZDs prescription – we have included an undetermined percentage of patients that might suffer from severe mental health disorder and to whom discontinuation of BZDs might be unappropriated.

Conclusions

The trial failed to demonstrate effectiveness from our intervention implementation in BZDs or antidepressant prescription trend and diagnosis coding. However, our study gives relevant intel regarding compliance with interventions aiming to change prescription behaviour in primary health care settings. Also, and in a broader sense, we consider that our results should encourage a profound reflection on the management of common mental disorders in primary health care settings.

Ethical approval

This trial was approved by the Ethics Commission for Health of the Regional Administration of Health for Alentejo Region (Portugal) (02/2016(CES)), and the Nova Medical School, Nova University Lisbon, Portugal Ethics Commission (47/2016/CEFCM). The results of this study were disseminated via peer-reviewed publications and conference presentations.

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4.3. Other relevant results coming from the effectiveness cluster-randomized trial

Context

BZDs are often prescribed to treat anxiety disorders, at the expense of the adequate pharmacological treatment with antidepressants (1,2).

Despite the focus of our intervention was BZDs prescription patterns, the ePrimaPrescribe DBCI platform also approached the need to consider antidepressant prescription to adequately treat anxiety and depressive disorder. More specifically, in the second module of our platform, addressing how to treat anxiety disorder avoiding the continuous use of BZDs, we specifically defined diagnoses criteria to anxiety disorder, the symptomatic overlap of depressive disorder and anxiety disorder, and the diagnostic assessment and treatment of anxiety disorder with antidepressants. On the third module of the ePrimaPrescribe platform, addressing how to manage BZDs dependence and advise to BZDs withdrawal, we discussed how to discontinue the use of BZDs and proposed the discontinuation or switch schemes using antidepressants. Thus, we expected that besides the primary effect on BZDs prescription patterns, our effectiveness trial would have an impact on antidepressant prescription.

Methods

The design, setting, participants' characterization, intervention, data collection, sample size and randomization applied to this section were the same to the ones previously described in section 4.2 addressing the effectiveness of intervention implementation in BZDs prescription patterns.

Outcomes

We used the frequency of antidepressant prescriptions issued per month, the proportion of prescriptions issued by participants included in intervention and control units over the study time frame and more specifically at baseline, six and 12 months after intervention.

We included antidepressants from the following Anatomical Therapeutic Chemical classification system-coded groups: N06A.

To study the effect of ePrimaprescribe on diagnosis registration, we used the monthly registration distribution of psychological symptoms, complaints, coded at the same month as antidepressants prescriptions. The GP's diagnosis registration used the International Classification of Primary Care, second edition (ICPC-2) developed and updated by the World Organization of Family Doctors' (WONCA) International Classification Committee (WICC).

Statistical methods

We followed the same statistical methodology applied previously in section 4.2. to analyse the change in BZDs prescription patterns.

We performed an exploratory descriptive analysis using number of prescriptions as primary measure of outcome, considering as main influencing factors the patient's age and sex, by units of intervention and control.

We performed most analysis at the level of intervention versus control clusters (so compared together the set of intervened units vs the set of control units), since the available data did not allow for the author to identify each of the participating GPs, hence also not allowing to distinguish in the intervention units, which GPs were compliant with the intervention (i.e. the GPs that actually used the online platform), from those that, although initially agreeing to participate, finally did not use the platform.

We tested for significant differences among the baseline characteristics of the intervention and control group. We performed descriptive analysis, with continuous variables summarized using means and standard deviations for normal distributions, and by medians and the 25th and 75th percentiles for non-normal distributions.

Estimated effects were calculated by comparing number of prescriptions in the intervention and control groups at baseline, six months, and 12 months after intervention.

All analyses were performed on an intention-to-treat basis (i.e., all initially enrolled GPs were included in the analysis according to the group to which they were assigned). This approach reduced the bias that may occur when participants not receiving assigned treatments are excluded from analysis.

The intervention and control groups were compared at the defined time points accounting for clustering by unit.

We tested for significant differences in the baseline characteristics of the control and intervention groups using t-tests or one-way ANOVA. This included calculation of means and/or proportions with Confidence Intervals (Cis), and on robust Standard Deviations (SDs) (to account for clustering).

We performed a secondary analysis where we explored the association between the frequency of antidepressant prescription with diagnoses using Chi-Squared tests for testing independence in two-way contingency tables. The Cochran-Armitage trend test was employed to assess how the proportion of two ordinal successes varies across the levels of a binary variable. And when both variables in a contingency table had ordered categories, the linear-by-linear test was used instead (3).

Statistical significance was considered for p-values < 0.05.

The R statistical software (4,5) was used to perform all the statistical analyses within the RStudio integrated development environment for R, RStudio Team (2019). The graphs and plots were obtained with use of the *ggplot2* R package (6).

Results

Characteristics of patients with antidepressant prescription

Concerning patients with antidepressant prescription, at baseline, the average age was 64.4 years old at intervention group, and 65.1 years old at control group. The age between

intervention and control group did not change significantly between baseline, six months and 12 months after intervention ($p=0.081$).

When specifically addressing age categories, we found that antidepressants were more frequently prescribed to older patients both at intervention (between 50.3 and 50.5%) and control group (52%). This prescription remained constant at age category over 65 years old (the Cochran-Armitage test ($p\text{-value} = 0.545$)) (Table 10), hence the proportions of prescriptions for <65 and >65 did not seem to change after intervention implementation.

Antidepressants were more frequently prescribed to females, either at baseline (79.1%%), six months (79.2%) and 12 months after intervention (79.2%). The frequency of prescription to females did not change significantly at different points in time withing (0.911) and between intervention and control group (0.46) (Table 10).

Table 10. Characteristics of patients with antidepressant prescription.

Characteristics	Baseline		6 months after intervention		12 months after intervention	
	Intervention	Control	Intervention	Control	Intervention	Control
Age (years)						
Average	64.4	65.1	64.4	65.2	64.1	64.9
Significance (IC 95%): $p=0.081$						
Age (years)	n antidepressant prescriptions by age (relative%)					
0-25	44 (0.7)	68 (1.1)	63 (1)	54 (0.8)	51 (0.7)	60 (1)
25-44	702 (10.5)	570 (9.2)	614 (9.9)	584 (9.7)	726 (11.4)	539 (9.5)
45-50	1728 (26)	1496 (24.6)	1587 (25.7)	1394 (23.1)	1579 (24.7)	1348 (23.7)
60-64	636 (9.5)	672 (10.9)	667 (10.8)	654 (10.8)	695 (10.9)	648 (11.4)
>65	3350 (50.5)	3223 (52)	3118 (50.4)	3136 (52)	3214 (50.3)	2961 (52)
N/D	173 (2.6)	148 (2.3)	135 (2)	210 (3.5)	126 (1.9)	139 (2.4)
$p=0.545$						
Sex	n antidepressant prescriptions by gender (relative%)					
Male	1386 (20,9)	1255 (20,3)	1367 (22,1)	1135 (18,8)	1330 (20,8)	1117 (19,6)
Female	5247 (79,1)	4922 (79,7)	5061 (79,2)	4897 (81,2)	5061 (79,2)	4578 (80,4)
Significance (IC 95%): Intervention: $p=0.911$; Control: $p=0.313$; Between intervention and control: $p=0.46$						

Antidepressant prescription characteristics

Regarding antidepressant prescription by type of primary health care unit, the proportions of prescriptions at USCP units included in the intervention group decreased significantly with time (the Cochran-Armitage test supports the trend hypothesis (p -value <0.001)). The proportions of prescriptions at USF type units included in the control group also decreased significantly with time (Cochran-Armitage test with a p -value <0.001) (Table 11).

Table 11. Antidepressant prescription by type of primary health care unit.

Type of primary health care unit	Baseline		6 months after intervention		12 months after intervention	
	Intervention	Control	Intervention	Control	Intervention	Control
UCSP	2220	2449	2090	2478	1616	2536
USF	4413	3728	4094	3554	4775	3159

$p_{\text{intervention}}=<0.001$, $p_{\text{control}}=<0.001$.

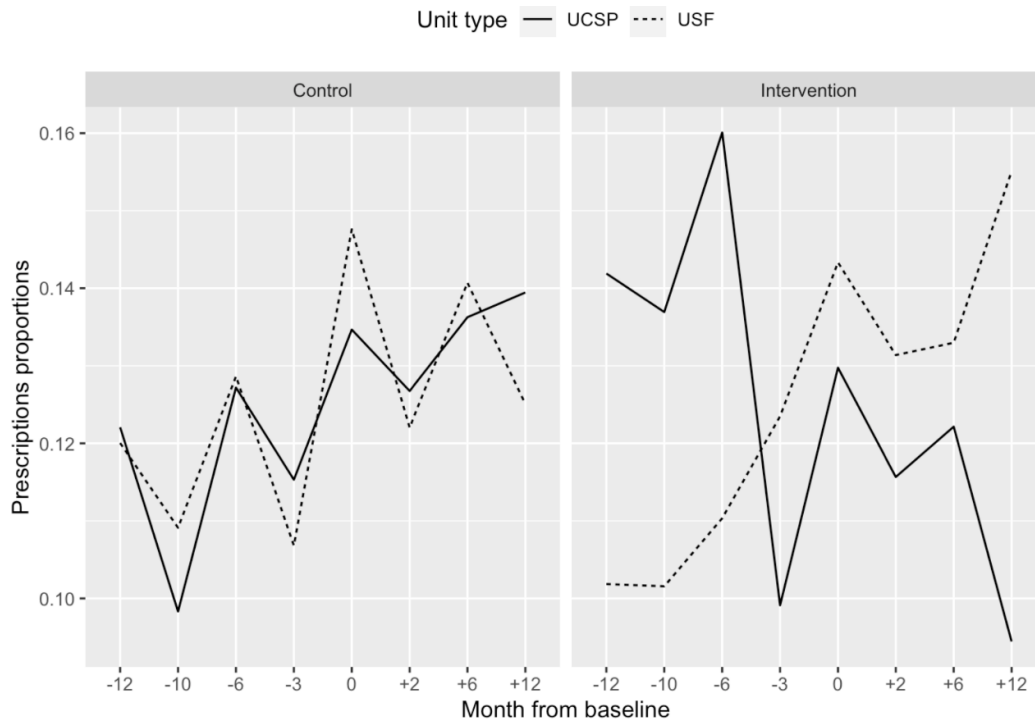


Figure 8. Proportion of antidepressant prescription by type of primary health care unit.

Regarding the most frequently prescribed antidepressant active pharmaceutical ingredients, venlafaxine, was the most frequently prescribed drug, both at intervention group (varying between 18.8% and 19.8%) and control group (varying between 22.1% and 24.1%). Venlafaxine prescription decreased at 12 months after intervention implementation. We found that the distributions of the active pharmaceutical ingredients prescribed changed over time both at intervention and control group (Chi-square test of homogeneity $p > 0.001$). Specifically concerning antidepressants with sleep induction properties, mirtazapine prescriptions increased at 12 months after intervention implementation, trazodone prescription trend did not change after intervention implementation (Table 12 and Figure 9).

Table 12. Antidepressant prescription frequency by active pharmaceutical ingredients.

Most prescribed Antidepressants N prescription (relative %)	Baseline		6 months after intervention		12 months after intervention	
	Intervention	Control	Intervention	Control	Intervention	Control
Venlafaxin	1315 (19.8)	1519 (24.6)	1166 (18.9)	1398 (23.2)	1200 (18.8)	1260 (22.1)
Sertraline	802 (12.1)	781 (12.6)	777 (12.6)	730 (12.1)	804 (12.6)	785 (13.8)
Escitalopram	1011 (15.2)	575 (9.3)	891 (14.4)	626 (10.4)	909 (14.2)	594 (10.4)
Fluoxetine	726 (10.9)	529 (8.6)	685 (11.1)	513 (8.5)	596 (9.3)	468 (8.2)
Trazodone	655 (9.9)	502 (8.1)	486 (7.9)	617 (10.2)	594 (9.3)	606 (10.6)
Paroxetine	455 (6.9)	485 (7.9)	420 (6.8)	466 (7.7)	423 (6.6)	472 (8.3)
Mirtazapine	433 (6.5)	401 (6.5)	488 (8)	447 (7.4)	521 (8.2)	318 (5.6)

$p_{intervention} > 0.001$, $p_{control} > 0.001$.

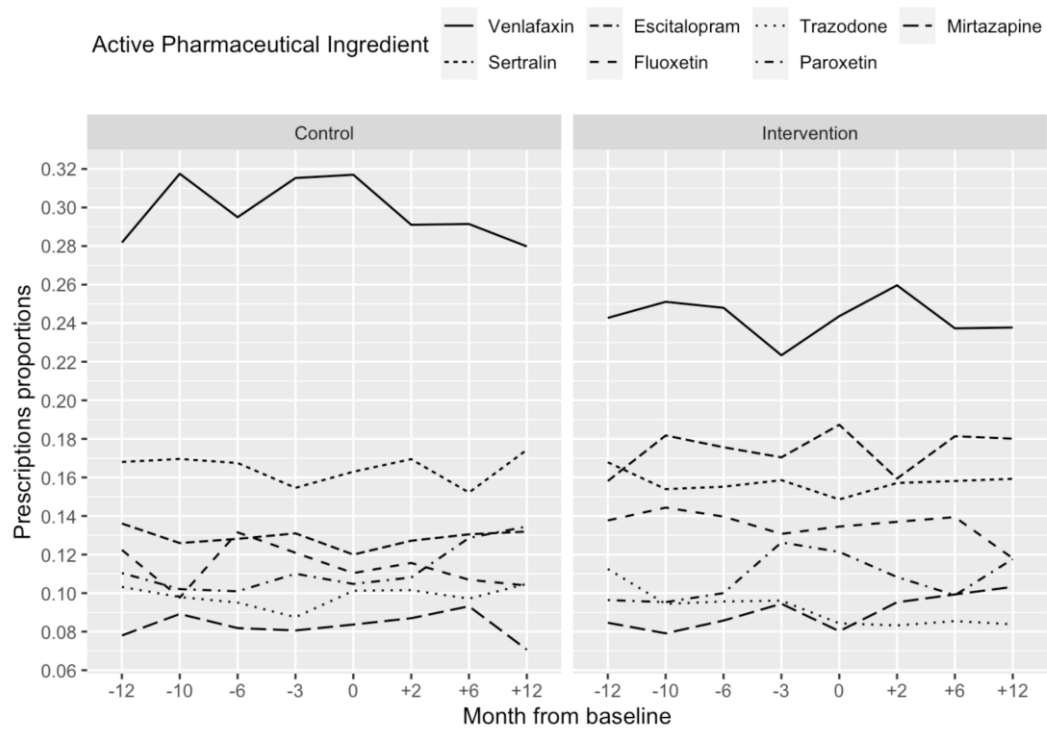


Figure 9. Antidepressant prescription proportion by active pharmaceutical ingredients.

A more specific analysis, regarding prescription by active pharmaceutical ingredient to patients over 65 years old, showed that venlafaxine is still the most frequently prescribed. There was a slight increasing prescription trend with most active pharmaceutical ingredient after intervention implementation at intervention group, except for venlafaxine (Figure 10).

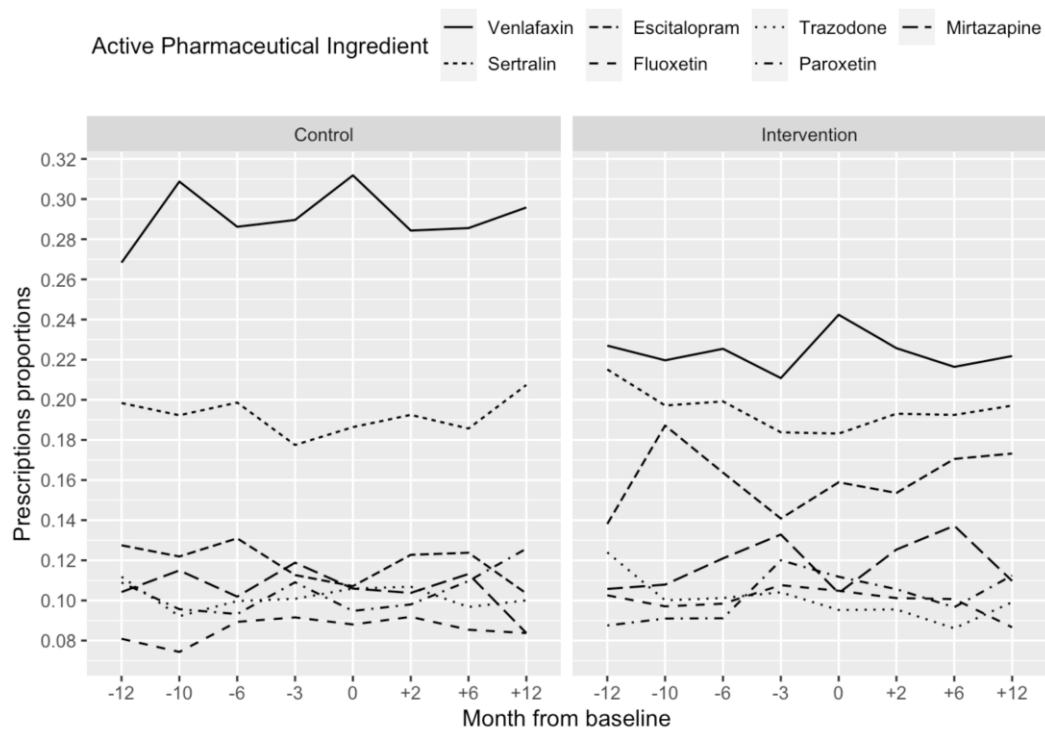


Figure 10. Antidepressant prescription proportion by active pharmaceutical ingredient to patients over 65 years old.

When specifically considering prescription by active pharmaceutical ingredient to females, the prescription trend did not change over time, hence intervention implementation did not seem to have any effect in prescription trend.

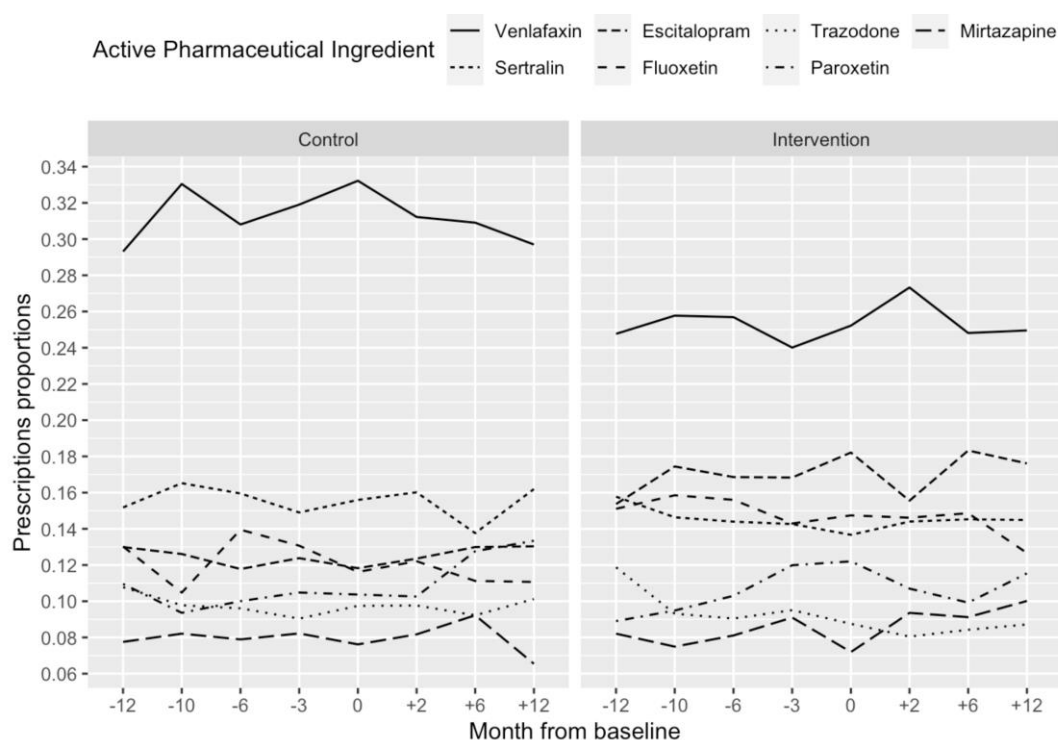


Figure 11. Antidepressant prescription proportion by active pharmaceutical ingredient to female patients.

Diagnosis registration coded in the same month as antidepressant prescription

To perform the following analysis, we used a database with all diagnosis that were coded during our study time frame.

Diagnosis included in this secondary analysis are detailed in Additional file 8.

During the time of interest for our research (12 months before to 12 months after intervention implementation), 10.607 complaints/diagnosis were coded to patients with antidepressant prescriptions.

Depressive disorder (P76) was the diagnosis more frequently coded both at intervention and control group, at baseline, 6 months after intervention and 12 months after intervention (between 39.3 and 75.3% of the six most frequently coded diagnosis). It was followed by sleep disturbance (P06) (between 3.8 and 23.9% of the six most frequently coded diagnosis). Anxiety disorder/anxiety state (P74) was the third most frequent coded diagnosis (between 8.7 and 22.7% of the six most frequently coded diagnosis). Feeling anxious/nervous/tense (P01) was the fourth most frequent coded diagnosis (between 1.1 and 18.1% of the six most

frequently coded diagnosis), followed by dementia (P70) (between 2.2 and 23.1% of the six most frequently coded diagnosis), and by feeling depressed (P03) (between 0.9 and 10.6% of the six most frequently coded diagnosis). There is evidence that the distributions of the diagnostics differed over time, both at intervention ($p=0.007$) and control group ($p<0.001$). We could not find a significant increase of depressive disorder (P76), anxiety disorder/anxiety state (P74), sleep disturbance (P06) or of the feeling anxious/nervous/tense complaint, in the intervention group after intervention implementation.

Table 13. Diagnosis coded at the same month as antidepressant prescription.

Diagnosis associated to antidepressive prescription n (relative %)	Baseline		6 months after intervention		12 months after intervention	
	Intervention	Control	Intervention	Control	Intervention	Control
P76	62 (43.1)	50 (44.2)	64 (39.3)	67 (75.3)	53 (48.2)	59 (56.7)
P06	11 (7.6)	11 (9.7)	39 (23.9)	4 (4.5)	9 (8.2)	4 (3.8)
P74	19 (13.2)	19 (16.8)	31 (19)	8 (9.0)	25 (22.7)	9 (8.7)
P01	26 (18.1)	10 (8.8)	23 (14.1)	1 (1.1)	19 (17.3)	8 (7.7)
P70	15 (10.4)	11 (9.7)	6 (3.7)	2 (2.2)	3 (2.7)	24 (23.1)
P03	11 (7.6)	12 (10.6)	-	7 (7.9)	1 (0.9)	-

$p_{\text{intervention}} < 0.001$, $p_{\text{control}} < 0.001$.

Discussion of findings coming from secondary analysis

Antidepressants were more frequently prescribed to older patients and females, which is in agreement with previously published research (7). The reasons for these finding are probably similar to the ones mentioned for the higher BZD prescription: older people present a higher prevalence of anxiety disorders and organic conditions and demand for more frequent medical attention (8–10); most epidemiological studies in the community show a prevalence of psychiatric disorders which is two to three times higher in women than in men (8,9), women tend to consult more frequently with their doctors than do men, women might present anxiety and depressive disorders with complaints which are easier for GPs to interpret and identify (10).

We found that antidepressant prescription decreased after intervention implementation, both at units included in intervention and control group. This trend goes on the opposite sense of our expected results. We hoped that after intervention implantation, with a successful use of our DBCI ePrimaPrescribe, a decrease in BZDs prescription (which was also not verified as presented and discussed in section 4.2), would be followed by an increase in antidepressant prescription. These expected results would mean that an effective implementation of our intervention would allow patients with a diagnosis of anxiety and/or depression, wrongly treated with BZDs, to be prescribed with antidepressants. Our trial did not find this expected effect. The reasons for these results might be related with barriers to change BZDs prescription, and in a broader sense to knowledge acquisition, which were further explored in our implementation trial, as detailed in section 5. Notwithstanding, there was a very slight and non-significant increase in antidepressant prescription to elders, which might translate the attempt to adequate treatment of anxiety and depressive disorders after our intervention implementation.

Similarly to what was found regarding BZDs prescription trend, there was no significant change by type of primary health care unit, which might be related to the fact that there are no performance indicators regarding antidepressant prescription.

Venlafaxine was the most frequently prescribed antidepressant active pharmaceutical ingredient and was still the most prescribed ingredient when analysing prescription to patients over 65 years old. Venlafaxine is a Serotonin Norepinephrine Reuptake Inhibitor (SNRI), with formal usage indication for depression, generalized anxiety disorder, social anxiety disorder, panic disorder, posttraumatic stress disorder and premenstrual dysphoric disorder. It is usually considered as a second choice treatment to both anxiety and depressive disorder due to its double effect, and more pronounced secondary effects, namely increased blood pressure (2,11). The finding that Venlafaxine is the most frequently prescribed ingredient, and specifically to older people, is not in accordance either with national or international data, where SSRIs are privileged (12–14). We can hypothesize that the choice of Venlafaxin might be mostly related to pressure and influence coming from the pharmaceutical industry. We might infer other reasons such as the failure of previous treatment with an SSRI, the most prescribed antidepressants reported in the literature, the perceived severity of symptoms or the search for treatments with a broader action hence ensuring the improvement of psychological complaints.

There was only a slight increase in mirtazapine, an antidepressant with sleep induction effect, which is in accordance with our finding regarding the absence of a positive effect in the sense of the replacement of BZDs with antidepressants to treat insomnia complaints.

As previously discussed, regarding the analysis of diagnosis registration in the same month as BZDs prescription (section 4.2), in Portugal it is not mandatory to perform a diagnosis coding each time a GP issues a prescription. The registration tool available in the Portuguese primary health care units allow GPs to code just once a certain diagnose and keep it associated with the patient file, hence dismissing further need to repeat the diagnosis coding registration, no matter how long the treatment for that disorder is kept. We recognize that this fact limits the validity of our analysis, since most prescriptions are not associated with a diagnosis, and also because even when there was a diagnosis registered in the same month as the prescription, this did not mean that symptoms or disorders were identified at the moment of prescription. Notwithstanding, the diagnoses registered in the same month as antidepressant prescription are in accordance with the main indications to antidepressant prescription. This fact may indicate that GPs are more accurate to identify the right diagnosis criteria to prescribe antidepressants then to prescribe BZDs. We may also infer that, given the very high BZDs prescription pattern previously reported in section 4.2, GPs might choose to issue concomitant prescriptions of BZDs and antidepressants when treating depressive disorders, possibly to ensure clinical improvement through pharmacological prescription, due to the perception of lacking alternative treatment options, as explored in section 5.

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**Barriers and facilitators for implementing an
online program to change benzodiazepine
prescription**

5. Barriers and facilitators for implementing an online program to change benzodiazepine prescription

5.1. Barriers and facilitators for implementing an online program to change benzodiazepine prescription – in depth analysis of different data sources

In this Part we evaluate the ePrimaPrescribe Digital Behaviour Change Intervention (DBCI) implementation process through the collection and analysis of data about two assumptions:

1. That a consistent and long-term change in BZDs prescription trend would be possible through clear identification of facilitators and barriers.
2. That identification of facilitators and barriers influencing the feasibility of implementing a DBCI-based online program would contribute to the development of innovative medical education tools.

For developing the research contained in this Part 5, we included a sample of voluntary GPs that provided individual sociodemographic information, quantitative and qualitative data that allowed us to do a process evaluation of implementation during our clinical effectiveness trial, as part of our effectiveness-implementation hybrid type 1 study. This sample was recruited during the initial face-to-face implementation visit.

We collected sociodemographic data and questionnaires from 47 GPs included in the intervention group (since six GPs decided not to participate after the initial face-to-face visit and five dropout); and from 46 GPs included in the control group (five decided not to participate after the initial face-to-face visit; one dropout).

The flow of participants in Part 5 is illustrated in the following Figure 12:

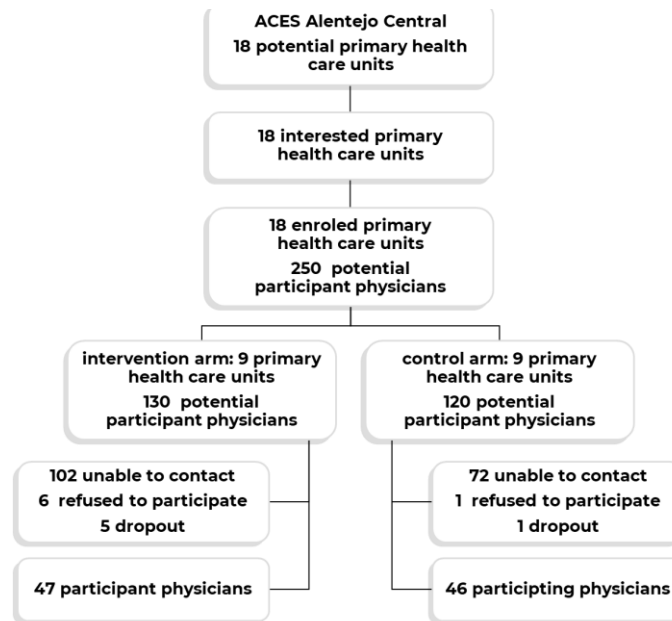


Figure 12. Flow of participants in part 5.

This part of our research included data from the following sources:

- Onsite survey;
- Barriers and Facilitators Assessment Instrument (BaFAI);
- Exploratory group discussion;
- Semi-structured in-depth interviews;

Onsite survey

We distributed, during an initial and end-of-study onsite visit, a questionnaire to participating GPs included in the intervention arm, with the following objectives: self-evaluation of knowledge about the management of patients with anxious and depressive symptomatology; reasons for BZDs prescription; subjective assessment of the amount of BZDs and antidepressants prescribed; reasons for keeping long-term BZDs prescription; difficulties for changing long-term BZDs prescription; the degree of concern with continued BZDs prescription; knowledge and perception of the degree of adequacy of the existing Portuguese guideline on BZDs prescription; perception of the motivations and expectations regarding the use of the ePrimaPrescribe program in clinical practice and of participation in the study. Sociodemographic data were requested to all participants (sex, age, date of onset of clinical activity).

The onsite questionnaire had 11 multiple answer questions and 11 short answer questions (Additional file 10).

The final version was tested and reviewed by three primary health care doctors before implementation.

The onsite survey questionnaire included indicators that allowed to collect quantitative information sufficiently vast and complex for an initial characterization of prescription dynamics and perceptions concerning the implementation of a Digital Behaviour Change Intervention (DBCI) online program at a primary health care setting. From this questionnaire, we progressed for a qualitative deepening by constructing a less structured and more open script, as further described in *Semi-structured in-depth interviews* section.

Participants

We considered questionnaires valid if handwriting was legible, if less than 50% of questions were lacking an answer, and when GPs answered both initial and final onsite visit questionnaires.

At the initial moment, we obtained 47 validated questionnaires; at the end-of-study implementation onsite visit, we obtained 37 validated questionnaires. Considering our inclusion criteria, we included in our analysis the questionnaires from the 37 participants that successfully filled the questionnaires at both initial and end-of-study onsite visit.

We analysed multiple answer questions with quantitative descriptive statistical tests; we used qualitative thematic analysis to present results from short answer questions.

We characterized participant GPs according to their utilization of the ePrimaPrescribe program, the type of primary health care unit where they were prescribing, their sex, age, years of clinical experience and training in mental health. We found that most respondents used the ePrimaPrescribe platform and were prescribers at USF primary health care unit type; that the average age was over 47 years old; the average years of clinical experience was over 20; most GPs had at least some specific training in mental health.

Table 14. Characteristics of onsite questionnaire responders.

Characteristics	Used ePrimaPrescribe online platform		Didn't use ePrimaPrescribe online platform	
	USF	UCSP	USF	UCSP
Female, n (%)	15 (62.5)	3 (12.5)	3 (12.5)	3 (12.5)
Male, n (%)	4 (30.8)	3 (12.5)	5 (38.5)	1 (7.7)
Age				
n	19	6	8	4
average	49.7	56.5	47.4	55.8
SD (min, max)	13 (30, 67)	10.1 (39, 65)	16.54 (28, 66)	8.66 (44, 64)
Years of clinical experience				
n	19	6	8	4
average	23.1	27.83	20.75	29.75
SD (min, max)	12.48 (3, 40)	11.36 (8, 40)	15.8 (3, 39)	8.1 (19, 38)
Training in mental health				
Yes, n (%)	10 (47.6)	4 (19)	5 (23.8)	2 (9.5)
No, n (%)	9 (56.3)	2 (12.5)	3 (18.8)	2 (12.5)

Partial results

Multiple answer questions:

Descriptive statistical analysis of results from t0 and t12 onsite questionnaire's multiple questions.

General analysis

The analysis further detailed in the next Table 15 shows that most of the GPs included in our study considered having a reasonable level of knowledge for managing patients with anxious and depressive symptoms. They report prescribing both antidepressants and BZDs often or many times. The majority reported knowing the DGS guidelines regarding the symptomatic treatment of anxiety and insomnia with BZDs and similar drugs, but many considered it just reasonably useful. There was a high degree of motivation to participate in the study when it began, which decreased by the end of the study. Most respondent participants actively use the ePrimaPrescribe platform, and they considered its implementation feasible both at the beginning and at the end of the study. The participant GPs considered the platform would have an impact on changing their BZD prescription pattern, but the number of GPs reporting this impact significantly decreased by the end of

the study. Although the majority agreed on the establishment of indicators to monitor BZD prescription or to monitoring mental health status in the primary health care setting, still a significant number disagreed on this establishment. The majority thought it would make sense to have economic incentives for the adequate follow-up of people with anxiety and depression in primary health care.

Table 15. Results for onsite multiple answer questions.

	t0 n (relative %)	t12 n (relative %)	Fisher exact test
How would you rate your level of knowledge in managing patients with anxious and depressive symptoms?			
a) Inadequate	3 (9.09)	0 (0)	p=0.251
b) Reasonable	22 (66.67)	24 (68.57)	
c) Good	8 (24.24)	11 (31.43)	
d) Very good	0 (0)	0 (0)	
How would you describe the amount of antidepressants you prescribe?			
a) I never prescribe	0 (0)	0 (0)	p=0.006
b) I prescribe a few times	2 (5.41)	2 (5.41)	
c) I often prescribe	16 (43.24)	18 (48.65)	
d) I prescribe many times	19 (51.35)	17 (45.95)	
How would you describe the amount of BZDs you prescribe?			
a) I never prescribe	1 (2.70)	0 (0)	p=0.364
b) I prescribe a few times	5 (13.51)	9 (24.32)	
c) I often prescribe	22 (59.46)	19 (51.35)	
d) I prescribe many times	9 (24.32)	9 (24.32)	
Do you know the DGS guidelines regarding the symptomatic treatment of anxiety and insomnia with benzodiazepines and similar drugs?			
a) yes	26 (70.27)	24 (64.86)	p=0.472
b) no	11 (29.73)	13 (35.14)	
If you answered yes to the previous question, how would you rate the usefulness of the information contained in this guideline?			
a) Inadequate	4 (16)	0 (0)	p=0.895
b) Reasonable	16 (64)	15 (62.50)	
c) Good	4 (16)	9 (37.50)	
d) Very good	1 (4)	0 (0)	
Degree of motivation to participate in this study			
a) None	0 (0)	0 (0)	p=0.614
b) Little	0 (0)	8 (32)	
c) Some	22 (59.46)	14 (56)	
d) A lot	15 (40.54)	3 (12)	

	t0 n (relative %)	t12 n (relative %)	Fisher exact test
Do you think it is feasible to implement online training programs like ePrimaPrescribe?			
a) yes	35 (94.59)	29 (87.88)	<i>p</i> =0.121
b) no	2 (5.41)	4 (12.12)	
Do you consider that the use of the ePrimaprescribe platform will have an impact on changing your benzodiazepine prescription pattern?			
a) yes	36 (100)	16 (69.57)	<i>p</i> = 0.138
b) no	0 (0)	7 (30.43)	
Do you agree with the indicator established for monitoring the amount of BZD prescribed to people over 65 years old?			
a) yes	21 (56.76)	20 (57.14)	<i>p</i> =0.097
b) no	16 (43.24)	15 (42.86)	
Do you think it would make sense to include new indicators for monitoring mental health status in people with anxiety and depression in primary health care?			
a) yes	23 (67.65)	26 (74.29)	<i>p</i> =0.01
b) no	11(32.35)	9 (25.71)	
Do you think it would make sense to have economic incentives for the adequate follow-up of people with anxiety and depression in primary health care, similar to what happens with diabetes?			
a) yes	18 (51.43)	26 (76.47)	<i>p</i> = 0.007
b) no	17 (48.57)	8 (23.53)	

Short answer questions

The next section presents the themes emerging from the analysis of the onsite questionnaire short answer questions. The detailed original categorization is presented in Additional file 11.

Questions concerning BZD prescription

Our first question asked participants to point the motifs for prescribing BZDs. We categorized the answers to this question into three main themes. Most participants answered pointing to clinical diagnosis they considered justifying the prescription, which were incorrect according to clinical guidelines to BZDs prescription; examples: anxiety disturbance; depressive disturbance; insomnia. We found a smaller proportion of answers pointing to clinical diagnosis they considered justifying the prescription which were correct according to clinical guidelines to BZDs prescription, such as acute anxiety symptoms, muscle relaxant. Respondent participants also pointed reasons derived from their clinical routines, such as lack of time, efficacy, and fast action of BZDs to symptomatic relief.

We compared the answer's content from the initial and final onsite visit (t0 – t12) and found no difference either in the themes referred to or in the frequency of each of the themes.

When asking the main reasons to keep BZDs prescription, we found four main themes arising from the answer's analysis. Responders pointed to reasons related to characteristics of the disorder and difficulties in managing the symptoms that first motivated BZDs prescription. This was the most frequently mentioned reason to continued BZDs prescription, both at initial and final moment of assessment. Reasons related with patient's characteristics, namely patients demanding for BZDs prescription, were the second most frequent reason pointed by participant GPs to maintain prescription. Reasons related to prescribers' difficulties in changing prescription or lack of time or knowledge were the third most frequently mentioned. GPs also mentioned BZD/drug characteristics, such as tolerance and dependence.

We then asked about the main difficulties of changing BZDs prescription. Four main themes emerged from answer's analysis. Similar to the previous question, participants referred reasons related to characteristics of the disorder and difficulties in managing symptoms that first motivated BZDs prescription. Reasons related to patients' demands or social pressure were largely referred to and became very significant in questionnaires at the final onsite visit. Reasons related to environmental context, especially lack of time, were the second most frequently mentioned theme. The "lack of time" theme occurred more frequently than in previous questions. A theme concerning knowledge/training emerged very frequently in the initial questionnaire but much less frequently in the final onsite questionnaire. Finally, BZD's characteristics such as tolerance and dependence were also pointed as difficulties to change the prescription.

Questions regarding DBCI implementation efficacy and perspectives over continuous education in primary care

When asking the main motivations to use the ePrimaprescribe, three main themes emerged. Two themes, knowledge acquisition and practice improvement, focused the platform content; a third theme emerged, related to the format, but this was only mentioned a few times.

In the following question, we asked about expectations – so the purpose was more focused on understanding the expected outcomes instead of the reasons leading to participation (motivation – evaluated in a previous question). At the initial onsite visit, before platform

implementation, although the emerging themes were similar to the previous question (two themes related to the platform content – knowledge and practice improvement and one theme related to platform structure), the theme practice improvement was mentioned more frequently. At the end-of-study onsite visit, there was a clear shift in the main theme emerging, with references mainly to the structure and organization of the platform – either positive or negative.

We then asked about barriers to using the ePrimaPrescribe platform. Both at the initial and end-of-study onsite visit, two themes emerged. One of the themes concerned environmental context and resources, specifically pointing to the lack of time as an important factor limiting the platform utilization (the barrier that was mostly mentioned), besides technical issues (such as bad internet connection and lack of sound system), and related to the online format. Another theme emerging was related to motivation and skills, with respondents frequently referring to limited availability to use the platform and difficulties in using digital content as the main barriers to platform utilization. There were fewer answers to the final questionnaire since many GPs did not use the platform, so they probably felt it made no sense to answer this specific question.

We asked about perceptions over eLearning platforms (applied to Continuing Medical Education (CME)). Perspectives were either positive or negative. Positive perspectives emerged much more frequently at the first onsite visit (before platform implementation) than at the end-of-study onsite visit. Positive perspectives focused on the feasibility/practicability of the platform utilization/implementation, the ease of access to knowledge, and the ease of access concerning technical aspects (such as the possibility of utilisation at any time according to personal availability). Negative perspectives focused on the lack of time, the lack of motivation, issues with the platform format, such as the nonintuitive way of usage, technical issues, or general opinion of non-feasibility or non-practicability of implementation. It is important to highlight that a significant number of participants did not answer this specific question at the end-of-study onsite visit because they did not use the platform.

We then specifically asked about perceptions over the feasibility of the ePrimaPrescribe platform. It followed a multiple answer question asking if participant GPs considered the implementation feasible. In this preliminary question, most participants answered yes at the initial and final onsite visit. Considering this positive perspective, answers were categorized as related to ease of access due to technical characteristics of the platform (which was the theme that emerged more frequently); ease of access to knowledge improvement (second

most frequent theme); convenience of usage and practice improvement (which was not mentioned in the final onsite questionnaire). Considering a negative perspective, themes related to lack of time were more frequently referred to, followed by implementation problems related to technical issues and motivation. The negative perspective theme emerging more frequently concerned the need to use the platform in out of office hours.

The following question asked about the subjective awareness of the platform's impact on participant GPs' BZD prescribing pattern. It followed a yes or no multiple answer question asking if participants considered the platform utilization as having an impact in their prescription pattern. Most participants answered yes in the initial and final onsite visit in this preliminary question. However, the frequency of negative answers was more significant after intervention implementation. In this question, the themes were mostly related to a positive perspective over platform implementation's impact. Concerning this positive perspective, the themes that more frequently emerged were related to knowledge acquisition (the most frequently referred theme emerging in answers both at initial and final onsite visit); translation into practice (this theme only emerged at the initial onsite visit); and behaviour regulation, with GPs mentioning that the platform turned them more aware of the need to make a deep reflection on the consequences of their prescription pattern.

Questions regarding solutions to improve BZD prescription pattern

Although the onsite questionnaires did not primarily explore solutions to changing BZDs prescription pattern, the two last short answer questions specifically addressed the importance/impact of introducing new performance indicators. This type of indicators already exist to other areas of primary health care clinical practice (such as diabetes and hypertension vigilance), leading to a focus in GP's attention to these disorders.

We asked about perspectives over the inclusion of mental health performance indicators. It followed a multiple answer question asking if participants considered beneficial the inclusion of new mental health performance indicators. Most participants answered yes in the initial and final onsite visit. Concerning the themes emerging, they were either positive or negative. Negative themes (the minority) mentioned that the focus in performance indicators distort the primary purpose of quality clinical care. Positive perspective themes focused: evaluation benefits; the need for focus in mental health epidemiology and resource accounting such as time and resources spent treating mental health disorders at primary health care settings.

One final question asked specifically examples of performance indicators that participants would consider beneficial to implement, hence specific and practical solutions to change BZDs prescription and (in general) the management of mental health disorders in primary health care settings. The themes that emerged could be categorized in five domains: Prescription evaluation; Diagnostic evaluation; Clinical state/severity monitoring; Resource utilization; Patient satisfaction.

Discussion of partial results

Questions concerning BZD prescription

The first two onsite questionnaire questions were dedicated to exploring the level of knowledge in managing patients with anxiety and depressive symptoms and reasons for prescribing BZDs. Results from both initial and final questionnaires showed that the majority of participating primary health care doctors considered having a reasonable or good level of knowledge, and subjectively recognized often prescribing BZDs. This perception corresponds to an underestimated prescription pattern, which was in fact very high in Alentejo region during the time the study was performed.

When asked about the reasons to prescribe BZDs, most participants mentioned inadequate reasons, namely anxiety and depressive diagnostics (in which the utilization of BZDs as treatment is incorrect), hence showing incongruence between their perceived level of knowledge and the treatment they choose to treat anxiety and depression. This issue was further explored in in-depth interviews, but we consider significant, especially considering this data coming from a larger sample, to infer that the lack of knowledge might be an unperceived and hence non-reported barrier to change BZDs prescription.

Concerning the reasons to keep BZDs prescription and the difficulties of changing BZDs prescription, the emerging themes emphasized external locus.

Most answers to these questions are relevant examples of searching for reasons to justify a prescription that GPs recognize as inadequate but necessary. In participant GPs' implicit discourse, the pathology characteristics seem never to improve or at least never improve enough to enable prescription discontinuation. GPs often refer to the difficulty of managing the symptoms and the disorder's characteristics by repeatedly mentioning how often the symptoms persist. GPs account for patient's demands, patient's insistence on the need to continue taking BZDs and non-compliance to withdrawal indications. In GPs' perception,

and again emphasizing what seems to be a certain detachment from their ultimate responsibility in the prescribing act, they blame the characteristics of the drug itself (it is too addictive, as if dependence was something that happened without their direct interference/responsibility), the lack of time and the initiation or renewal of the drug by other doctors (so it's not even worth trying because others will take the easiest path and keep the prescription when asked).

The literature reports similar evidence of a certain lack of insight over the primordial role of GPs in keeping the vicious cycle of excessive BZDs prescription (1–3). Given the relevance of the themes emerging we also explored this subject through in-depth interviews.

Moreover, when asked to mention the three main difficulties to changing BZDs prescription, two themes emerged with significant frequency, especially at the final onsite visit: pressure from patients to continue medication (prescribers often used expressions such as “refusal to discontinue”; “demand to continue”); and external factors/environmental context, specifically the lack of time and availability to implement discontinuation schemes. The themes emerging in this question, especially from questionnaires at the final onsite visit, after platform implementation, led to a more focused perspective on the patient's influence in their decision to keep prescription, pointing, once again, to a sense of difficulty in defining the GPs' role when managing mental health disorders. Would GPs have the same permissive attitude if a patient questioned their decision to change an antihypertensive medication? Is it because they feel they are powerless to change the life events or suffering patients present to justify the continuing prescription? Do they feel they are not the ones responsible for taking care of mental health issues? Or they feel too overwhelmed by their tasks as a GP and don't have the energy/time/motivation to engage in interventions concerning mental health issues? These emerging questions were further explored by addressing them in our in-depth interviews.

Still concerning GPs' perceptions over the difficulties to change BZD prescription, we could find a significant difference on the frequency the theme knowledge/training was mentioned. The first questionnaire was filled after the presentation of the ePrimaPrescribe platform, so it was predictable that GPs would answer in agreement with the need for training. The final questionnaire was filled after exposing participants to a training, so it was expected that the lack of knowledge/training was less referred, making prescribing GPs to reflect on the reasons that prevent them from changing prescription after having the training or at least being more alert to the problematic of excessive BZDs prescription (since a significant

number of participants didn't use the platform). Probably the reasons pointed in the final questionnaire are more accurate with reality because they emerged after implementation period, during which GPs probably tried to change the prescription and more actively recorded in their experience what happen, and because they knew they would be probably asked about that issue at the end of the study.

Concerning the knowledge and perceived adequacy of the DGS clinical orientation regarding the symptomatic treatment of anxiety and insomnia with benzodiazepines, most participants reported not knowing the guideline both at the initial and final onsite questionnaire. Approximately one-third of the participants who knew the guideline referred they considered the usefulness of the information contained in the guideline as reasonable or good. The in-depth interviews further explored the meaning of such a low knowledge of this particular clinical orientation and the limitations of its usefulness.

Regarding the level of motivation to participate in the study, GPs' most frequent answer indicated a high level of motivation, especially in questionnaires answered in the initial onsite visit; the perceived levels of motivation to participate in the study decreased at the final onsite visit. We explored the factors influencing motivation, explicitly trying to understand if they were related to the platform structure and delivery mode (an online intervention) or the content, through the in-depth interviews.

Questions regarding DBCI implementation efficacy and perspectives over continuous education in primary health care

When questioned about motivations to use ePrimaPrescribe platform, at the first moment of assessment, before intervention implementation, most referred motivations related to platform content namely knowledge acquisition, and the second most referred theme was the motivation to change practice. The literature refers that often, after educational interventions, there is a knowledge improvement but that this does not translate into a change into clinical practice. Therefore, the reported motivations agree with common expectations towards what might have been expected by participants to be an educational intervention. Although the platform was more focused in achieving behavioural change (hence with a structure and content design different from purely educational interventions), the perceived motivations to use did not change at the final onsite questionnaire. We might infer that the lack of perception's change might be related to the fact that a significant number of participants did not use the platform and the majority used it only very briefly.

In the first questionnaire, only a minority of participants referred motivations related with the platform structure, mentioning as motivation the advantage of having the platform constantly available through online access. This theme was even less mentioned in the final questionnaire, which was also expected since, as previously mentioned, most participants in the study didn't finally use the platform.

We then questioned participants about expectations, so the purpose of this question was more focused in understanding the outcomes that were expected instead of the motivational factors influencing participation. At the initial onsite visit, the themes more frequently emerging were focused on knowledge acquisition and practice improvement, so in accordance with previously identified motivations. Notwithstanding, expectations about what an online format might bring was also frequently mentioned. Positive perspectives related to the structure of a DBCI were more frequently referred at the final onsite visit, suggesting that, having the right environmental conditions, there might be the possibility for a more generalized implementation for this type of interventions. At the final onsite visit, expectations related to practice improvement were less frequently mentioned, probably because participants were at that point more aware of the difficulties to change BZD prescription pattern.

When specifically asked about barriers to use the ePrimaPrescribe platform, time restraints were frequently mentioned as a barrier to platform utilisation – pointing to the fact that although primary health care doctors have “protected time” to training (15 days a year) they did not consider this time to use the platform – the reasons for this result were further explored in the in-depth interviews.

We asked about perceptions over eLearning platforms, hoping to do an initial exploration on the factors influencing the utilization of a DBCI in primary health care settings. The fact that positive perspectives were more frequent at initial onsite visit than at final onsite visit shows that results are in accordance with what we have previously identified: at initial onsite visit, so previously to implementation, there was a more positive attitude towards the intervention format than from results collected at the final onsite visit. Once again, this fact is probably related to a significant number of participants that did not use the platform. The majority considered the implementation of the DBCI ePrimaprescribe feasible, both at initial and final onsite visit, so they kept the same perspective although they knew they did not use it. When asked to mention the three main reasons to their answer (yes or no to feasibility), the themes emerging were related to technical, ease of access to knowledge, convenience and

practice improvement. This very positive general perspective about implementation is, however, in disagreement with the actual utilisation of the platform. We chose to investigate possible reasons for this incongruence in the in-depth interviews, but we might at this point also infer the probable influence of the fact that the intervention design, delivery and evaluation was coordinated by the author, so answers might in some way correspond to what participants would think it was adequate to answer and not correspond to their actual proceeding in clinical practice. Hence, the implementation of DBCIs (such as the specific example of our ePrimaPrescribe) in the present context and organization of Portuguese primary health care setting, despite ideally considered feasible, they would hardly be integrated in the daily routine clinical practice.

All participants considered at initial onsite visit that the platform would have an impact in changing their BZDs prescription pattern, and despite a significant number did not use it, the majority still considered that their participation in the study contributed to change their prescription pattern. Theoretically, just being more aware of the problematic of BZD prescription and the fact that they knew they were being observed (Hawthorn effect), could lead to a change in prescription pattern, but this, in fact, did not happen when we consider the quantitative results of our effectiveness trial; this discrepancy between subjective perspective and what data actually report might be explained by the next question that asked about the factors influencing the change (that subjectively they thought that would have happened), since the most frequently mentioned factor was knowledge acquisition; similarly to what we have previously discussed in this section, and in accordance to answers to question exploring motivations to use the platform and the answer was knowledge acquisition, this does not mean translation into clinical practice. Moreover, we observed that there was a clear shift between the perspectives at initial and final questionnaire, which once again might translate the difference between initial expectations and more realistic perspective after the platform implementation.

We finally asked some specific questions concerning the use of indicators and economic incentives. Our goal when asking these questions was to initially explore possible solutions to improve BZDs prescription, having in mind that according to the literature, multilevel interventions are the most effective way to change complex and multifactorial behaviours such as prescription pattern. Most participant GPs had a positive perspective over the inclusion of indicators, mostly mentioning the benefit of evaluation of their practice. Although it was a rather initial exploration of the thematic of suggestion to solutions, one

might infer that besides the need for interventions helping GPs to improve their knowledge, some measures allowing for self-monitoring and evaluation of prescription pattern, namely in comparison with colleagues prescribing in the same region and to similar population, were perceived as possibly having a positive impact.

A general view of the answers to onsite questionnaire (either at initial or end-of-study onsite visit) suggests an ambivalent attitude of practitioners towards BZDs prescription: they recognize the importance of mental health issues in their practice (and specifically concerning the excessive BZDs prescription what might mean – lack of time, lack of resources to treat mental suffering in a more adequate way), but at the same time they feel overwhelmed and lack the motivation to change. These issues were further explored in the in-depth interviews. Also, there is a clear change in perspective between answers to questionnaires before and after implementation, concerning expectations and perceptions over implementation of DBCIs in general and more specifically of the ePrimaPrescribe platform. This difference probably translates the more realistic and better insight of responders about the subject after participating in the effectiveness trial. Finally, we would like to highlight how the lack of time is mentioned across the entire questionnaire and in the answer to most questions, hence, this factor seems to significantly influence respondents' perceptions to different areas of our implementation trial.

Barriers and Facilitators Assessment Instrument (BaFAI)

At the end of intervention implementation period, we asked GPs who accepted to share data allowing for our implementation evaluation process (hence the same participants that answered to the onsite survey), to answer a questionnaire aiming to identify barriers and facilitators to implementation of online intervention platforms at primary health care settings. We choose to apply the Barriers and Facilitators Assessment Instrument (BaFAI). This questionnaire was applied to collect data concerning specifically the assumption that identification of facilitators and barriers influencing the implementation a Digital Behaviour Change Intervention (DBCI) would contribute to shape the development of innovative medical behaviour change interventions.

Implementing innovations is a difficult process, and knowledge about barriers and facilitators is crucial in this process. In order to respond to the need for a standardized instrument for the evaluation of barriers, the Centre for Quality of Care Research of Radboud University -

Nijmegen Medical Centre (The Netherlands) developed the Barriers and Facilitators Assessment Instrument (BaFAI). During its development, the questionnaire was applied in 12 different contexts of implementation, after a process of elaboration that used literature analysis and focus groups to identify potential barriers. These barriers were framed in clusters of 4-dimensional issues, as further described, and a final version was submitted to a process of validation that, among others, showed results in the identification of barriers in the area of cardiovascular diseases (4).

BaFAI includes a set of 25 issues related to barriers to implementation of innovations. These issues can be modified to allow a specific practice to be assessed.

Barriers and facilitators are organized into four categories according to the literature on implementation research processes in general (5), and the research of barriers and facilitators in specific (6): barriers deriving from the characteristics of the practice/innovation (questions 1-3, 13, 14, 16); barriers deriving from the characteristics of the professionals (questions 4-11, 21); barriers due to patient characteristics (question 12 e 22-25); barriers arising from the intervention context (questions 15, 17-20).

BaFAI can be applied to any professional working in a team integrated into a primary health service. It is suitable for professionals involved in the implementation of an innovative technique. It is a self-completion questionnaire that can be completed in the time interval between 15 and 20 minutes.

Our BaFAI version was developed considering a previous translation performed by Pedro Mateus (7), and the original instrument's authors consented its use. The adapted version to measure barriers and facilitators of our online platform implementation was submitted to a group of experts (Pedro Mateus, originally responsible for the Portuguese translation; to a psychiatrist and a primary health care doctor), to evaluate the facial validity and elaborate a final consensual version.

The questions were asked in the form of statements, in which respondents could indicate to what extent they agreed or disagreed with the statement. The variables under study are derived from the four dimensions previously stated. They are listed on a 5-point Likert scale, according to the following ordering: 1 - Strongly disagree, 2 - Disagree, 3 - Neither agree nor disagree 4 - I agree and 5 - I totally agree. Some questions are formulated positive, others negative. To find out which items are barriers, there is the need to evaluate the percentages disagree and fully disagree of positive questions (1-3, 16) and the percentage agree and fully

agree of negative questions (4-15, 17-27), which meant that we had to recode the answers accordingly. The degree of the barriers was calculated by adding the scores of the answers and calculating the final proportion. Items considered as facilitators are items with a percentage of 10% or less.

Participants

We applied the BaFAI to GPs participating in our implementation evaluation process from both intervention and control group, and that have used the platform. We choose to include GPs from both groups since this questionnaire aimed to understand the barriers and facilitators specifically addressing implementation of our DBCI at primary health care settings. Therefore, we considered interesting and relevant to compare results coming from GPs included in different groups, which were given access to interventions with similar format (DBCI) but with different content. With this analysis we hypothesized that similar barriers and facilitators in both groups would enhance the consistency of our findings.

For developing the research contained in this Part 5, we included a sample of voluntary GPs that provided individual sociodemographic information, quantitative and qualitative data that allowed us to do a process evaluation of implementation during our clinical effectiveness trial, as part of our effectiveness-implementation hybrid type 1 study. This sample was recruited during the initial face-to-face implementation visit.

We collected sociodemographic data and questionnaires from 47 participants included in the intervention group (since six GPs decided not to participate after the initial face-to-face visit and five dropout); and from 46 GPs included in the control group (five decided not to participate after the initial face-to-face visit; one dropout).

BaFAI questionnaires were only validated after checking that the responder had used the DBCI, hence, we obtained data from 24 questionnaires coming from the intervention group and data from 17 questionnaires coming from the control group. The flow of respondents is illustrated in the following Figure 13:

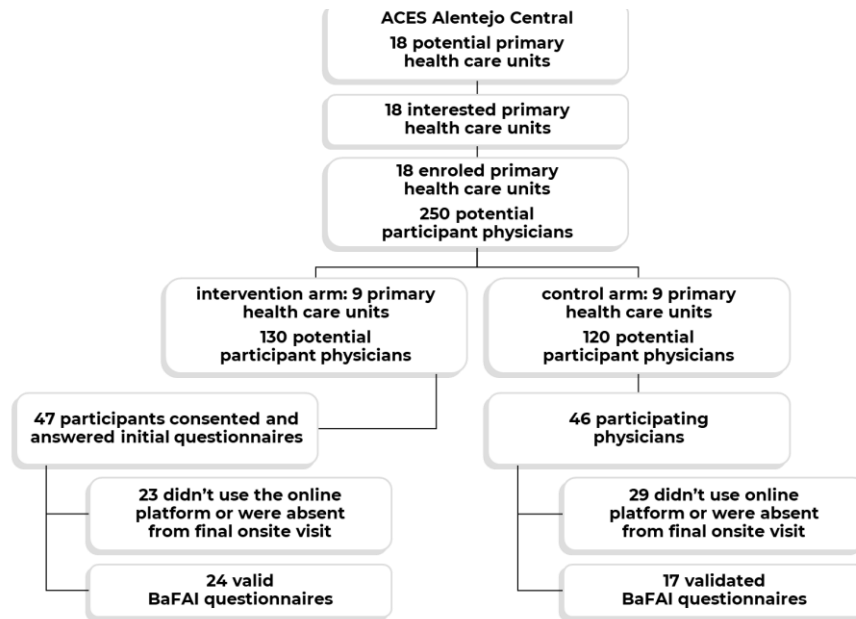


Figure 13. Flow of respondents to BaFAI.

We characterized participant GPs according to their study arm, the type of primary health care unit where they were prescribing, their sex, age, years of clinical experience and training in mental health. Responders' characteristics are summarised in the following Table 16:

Table 16. Characteristics of BaFAI responders.

Characteristics	Control		Intervention	
	USF	UCSP	USF	UCSP
Female, n (%)	6 (46)	0 (0)	16 (89)	3 (50)
Male, n (%)	7 (54)	4 (100)	2 (11)	3 (50)
Age				
n	13	4	18	6
mean	46.8	54.5	50.22	56.5
SD (min, max)	11.75 (34, 63)	12.71 (43, 76)	11.57 (32, 67)	10.07 (39, 65)
Years of clinical experience				
n	13	4	18	6
mean	19.15	28.5	23.5	27.83
SD (min, max)	12.18 (7, 38)	11.56 (18, 39)	10.93 (5, 40)	11.35 (8, 40)
Training in mental health				
Yes, n (%)	8 (62)	2 (50)	7 (39)	4 (67)
No, n (%)	5 (38)	2 (50)	11 (61)	2 (33)

Results

Analysis of answers to BaFAI questionnaire

When analysing the results of the questionnaire on barriers to the implementation of the DBCI, ePrimaPrescribe (Table 17), we found that the barriers with a higher prevalence were: Regarding characteristics of intervention, the need for time investment (54%); Regarding characteristics of the professionals, training attitude (42%), motivation and role, and related to problems changing old routines (42%) and the need for more knowledge about the DBCI (33%); Concerning patient's characteristics, the number of contacts with patients (62.5%); Concerning intervention context, the lack of instruments and facilities (in this case, specifically access to computer and/or a consultation office with a computer with a high-quality internet connection) (71%).

Considering as facilitators the variables with percentages below 10% (8), we highlight the specificity and didactic benefit (0%) and the model attractiveness (2%).

There were no statistical differences between the BaFAI applied to the intervention group (who received the intervention platform ePrimaPrescribe) and the control group (who received the alternative DBCI ComunicaSaudeMental, focusing communication techniques for managing patients with mental health disorders at primary health care settings). There was an overlap of barriers and facilitators found both for the intervention and control group.

Table 17. Barriers and facilitators to educational online platform (ePrimaPrescribe).

Factors identified as barriers	Intervention (n=24) (% of total)	Control (n=17) (% of total)
Characteristics of the practice/innovation		
The online platform leaves enough room for me to make my own conclusions – compatibility	1 (4)	1 (6)
The online platform leaves enough room to consider my patients related mental health needs – specificity	0 (0)	0 (0)
The online platform is a good starting point for my self- study. – didactic flexibility/benefit	0 (0)	1 (6)
Working according to the online platform is too time consuming. – time investment	13 (54)	10 (59)
The online platform does not fit into my ways of working at my practice. – attractiveness	7 (29)	6 (35)
The lay-out of this online platform makes it handy for use – attractiveness	2 (8)	4 (23.5)
Barriers deriving from the characteristics of the professionals		
I did not thoroughly use nor remember the online platform – training attitude	10 (42)	10 (59)
I wish to know more about the online platform before I decide to apply it – innovation doubts	8 (33)	10 (59)
I have problems changing my old routines. motivation and role	10 (42)	10 (59)
I think parts of the online platform are incorrect perception knowledge	0 (0)	0 (0)
I have a general resistance to working according to protocols participation	3 (12.5)	3 (18)
Fellow doctors (general practitioners) do not cooperate in applying the online platform – Involvement	3 (12.5)	7 (41)
Other doctors or assistants do not cooperate in applying the online platform – involvement	2 (8)	4 (23.5)
Primary health care coordinators do not cooperate in applying the online platform involvement	3 (12.5)	4 (23.5)
It is difficult to apply the ePrimaPrescribe platform ... because I am not trained to use online platforms workstyle	2 (8)	2 (12)
Barriers due to patient characteristics		
Patients do not cooperate in applying the online platform readiness to change	8 (8)	3 (18)
It is difficult to apply the ePrimaPrescribe platform to patients due to ethnicity characteristics	4 (17)	4 (23.5)
It is difficult to apply the ePrimaPrescribe platform to patients of low socio-economic background Financial situation	5 (21)	2 (12)

Factors identified as barriers	Intervention (n=24) (% of total)	Control (n=17) (% of total)
It is difficult to apply the ePrimaPrescribe platform to older patients (>65 year old) age	6 (25)	3 (18)
It is difficult to apply the ePrimaPrescribe platform to patients that rarely come to the primary health care unit – number of patient contacts	15 (62.5)	6 (35)
Barriers arising from the intervention context		
Working according to this online platform requires financial compensation	1 (4)	1 (6)
It is difficult to apply the ePrimaPrescribe platform if there is not enough supportive staff support staff	3 (12.5)	4 (23.5)
It is difficult to apply the ePrimaPrescribe platform if instruments needed are not available equipment suitable practice	17 (71)	13 (76)
It is difficult to apply the ePrimaPrescribe platform if physical spaces are missing (eg consultation office with computer) – location of facilities	16 (67)	9 (53)
It is difficult to apply the ePrimaPrescribe platform if physical space is lacking (e.g. consulting room) – location of facilities	7 (29)	9 (53)

χ^2 Pearson=162.15; Pr=0.130; Fisher's exact=0.012.

Discussion of partial results

The BaFAI documented that the barriers and facilitators to implementation of our intervention platform were similar to barriers and facilitators to our control platform, which used a similar methodology and format but a different content. This suggests that, when considering the implementation of a DBCI aiming to change a behaviour in primary health care setting, the following reported barriers would have to be considered, despite the content of the intervention: the need for time investment; the general attitude towards the DBCI; the motivation and self-perceived role of the professionals involved; and the resistance to a change old practice habits. The results also show clearly that a DBCI would be hard to implement if adequate instruments and facilities were not available.

The results found were similar to those of another study performed in Portugal (7). Although the content of the previous intervention implemented in Portugal was very different, the fact that the barriers and facilitators found were similar suggests the existence of common realities of the settings where the innovation was implemented in Portugal, and hence the multidisciplinary and possible generalization of our results.

Exploratory group discussion

At the final onsite implementation visit, we performed nine exploratory group discussions at primary health care units included in the intervention group.

These exploratory group discussions aimed to identify themes to be included in the outline of the semi-structured in-depth interviews by exploring perceptions about the issues questioned on the onsite survey and BaFAI questionnaire. The information obtained through these interviews was organized considering the two assumptions defined for this work package and allowed to identify themes to be further and in-depth explored in the semi-structured interviews (as described in detail in the next section).

Concerning our assumption which explored facilitators and barriers to a consistent and long-term change in BZD prescription trend, we approached the following topics: perceptions over the reasons for the existence of a high BZD prescription in primary health care settings; perceptions about the existing indicator about BZD prescription to elders; the factors influencing the decision of prescribing medication to people with light to moderate symptoms of anxiety/depression.

Concerning our assumption which aimed to explore facilitators and barriers influencing the feasibility of implementing a Digital Behaviour Change Intervention, contributing to the development of innovative digital medical tools, we approached the following topics: perceptions over feasibility of participation; identification of main facilitators and barriers to platform utilisation; reasons for very low platform utilisation (since most GPs initially expressed a positive expectation regarding the platform, as well as the feasibility of its implementation, but only a minority used it, and those who used it did so only a few times and for a short period); aspects that negatively influenced the initial high expectation for platform utilization (considering the initial expectation of what the platform would provide, what aspects of the utilization met that expectation and what aspects triggered this expectation); perception about the management of people with mental illness at primary health care settings (opinion regarding the management of the person with anxiety and depression in primary health care settings).

All meetings took place in private meeting rooms and had duration of approximately 60min. Discussions were recorded according to explicit authorization from all participants.

We reviewed the recording of these exploratory group discussions and took notes which contributed to preparing the semi-structured in-depth interview topics, described in detail in the next section.

Semi-structured in-depth interviews

The following section constitutes a deep diving into the materials and data coming from the semi-structured interviews. It is acknowledged that its content is parallel and, in some extent repeated, with the content of sections 5.2 and 5.3. We consciously choose to do so, to keep the richness of a profound qualitative analysis and discussion, presented in section 5.1.4., and at the same time combine it with quantitative data coming from the onsite questionnaire and the BaFAI using a mixed methodology, as presented in section 5.2 and 5.3.

Interview setting and data collection

We defined an initial convenience subject sample for our interview balanced for the following selection criteria: working in personalized health care units (UCSP) or in family health care units (USF); having or not specific training in mental health; having used or not the ePrimaPrescribe platform during the implementation phase of the study. These criteria were chosen considering their probable influence on behaviour towards implementation of the ePrimaPrescribe program.

GPs were selected from nine primary health care units included in the intervention group, according to their active participation on the study and looking for balanced baseline characteristics considering sociodemographic data and type of primary health care unit, as previously mentioned.

The topics included in this interview derived from three preliminary data sources: the onsite survey; the Barriers and Facilitators Assessment Instrument (BaFAI); and from the exploratory group discussions.

The resulting structure for this interview aimed to explore in-depth the barriers and facilitators to implementation of a DBCI to change BZD prescription in primary health care settings (two assumptions considered for part 5) as well as perceptions over solutions for changing excessive BZD prescription (as detailed in part 6).

Following the three main areas of interest to be explored, the interview was divided in three topics:

The first topic of the interview concerned the **barriers and facilitators to a consistent and long-term BZDs prescription trend change**. In this section, a barrier was defined as any factor that limited or restricted change in BZDs prescription patterns. We focused on barriers that could be changed by an intervention. As a result, we did not consider age, sex or ethnic background as barriers. Accordingly, we defined facilitator as any factor promoting or helping changing BZDs prescription pattern.

We divided this interview topic into two main themes: one exploring the profile of BZDs prescription at primary health care settings, aiming to compare the profile of our sample with characteristics described in the literature (1,9); another specifically exploring the barriers and facilitators to changing BZD prescription patterns. For this section of the interview, we designed our questions based on our literature review (detailed in part 1); suggestions coming from the experts that evaluated the intervention before implementation; information from the short-answer questions of the onsite questionnaire; and from topics mentioned in exploratory group discussions.

The second topic of the interview concerned the **barriers and facilitators for implementing a Digital Behaviour Change Intervention (DBCI) online program contributing to the development of innovative medical educational tools**. In this section, a barrier was defined as any factor that limited or restricted utilization of online educational programs. Once more, we focused on barriers that could be changed by an intervention. As a result, we did not consider age, sex or ethnic background as barriers. We defined facilitator as any factor promoting or helping the implementation of online educational programs.

We divided this interview topic into two main themes: perspectives concerning Continuing Medical Education (CME) at primary health care settings; and perspectives concerning digital platforms designed to Continuing Medical Education (CME), more specifically over the DBCI ePrimaPrescribe.

Questions integrated in this topic of the interview were based on our literature review (detailed in part 1); suggestions coming from the experts that evaluated the intervention before implementation; information collected from the BaFAI; information from the onsite

questionnaire short-answer questions, and from topics mentioned in exploratory group discussions.

The third and final topic of the interview focused on exploring participant GPs' perceptions over solutions to the excessive BZDs prescription at primary health care settings, and to a consistent and long-term BZD prescription trend change. This interview section is further detailed in part 6.

Using a language and nomenclature akin to the one collected from preliminary sources, the interviews served, on one hand, to contextualize the prescription and capture the logic and rationalities underlying the various decisions that GPs take in the different therapeutic paths while prescribing BZDs. On the other hand, they served to understand perceptions concerning the implementation of a DBCI and, in a wider perspective, the perceptions over continuous medical education in primary health care settings, specifically concerning continuing medical education through digital learning applications.

The semi-structured in-depth interviews also allowed to reconstruct and deepen procedural aspects, relating them to the experiences and rationalities around the three areas of interest to be explored, and major dimensions of analysis. We chose to adopt an inverse sequential logic, where the formulation of interview questions started from the conception of the prescription in general and was furthered based on personal experiences of BZDs prescribing act, and on the impact of implementing our DBCI regarding perceptions over the need for continuing medical education.

We conducted a pre-test interview to validate the content of the data collection instrument, to check familiar and lexical options, to stabilize the categories and identify more problematic, or emerging ambiguous interpretation issues, to discover potential errors, and to assess the duration of the interviews.

A full version of the original in-depth semi-interview is presented in Additional file 12.

Data analysis

After the verbatim transcription of the interviews, carried out with 12 GPs, the qualitative analytical framework used consisted of a content and discourse analysis (10,11) made with the support of the software Atlas.ti (12). The interviews' content was categorized according to the themes of the onsite survey, to which specific categories stemming from the interviews themselves were added. This process was developed in collaboration to refine and discuss the kind of categorization created and its conformity with the *in loco* experience of the empirical research. The categories and processes identified were then further explored according to the specific focus of our work.

The objective of the use of these methods and analytical tool was to identify, in a more subjective and intimate manner, the various discourses produced about BZDs prescription by the interviewed GPs, their relation to specific prescribing practices, and how these were entangled with wider socio-cultural and organizational conjunctures, as well as with more subjective motivations and sense making processes guiding therapeutic practice. To do so we looked for a methodological guidance by using an ethnographic framework and focus on local worlds, as suggested by Kleinman (13), since it allows to combine qualitative research with multiple approaches such as epidemiologic, survey and psychometric. In this perspective, ethnography calls into question the radical separation of the qualitative and quantitative while at the same time encouraging exploration of novel ways of combining both in interdisciplinary studies and hence allow for a higher scholarly depth (14).

Results

A convenience sample of eight interviews was initially defined, but we finally carried out 12 interviews until saturation of the themes and topics found was reached, with no further new reported information.

Table 18 presents the distribution of participants by selection criteria.

Table 18. Distribution of participants by selection criteria.

Coded id	sex	age	# years of clinical experience	specific training in mental health	Usage of ePrimaPrescribe	Type of primary health care unit
Interview 1	F	38	10	Yes	Yes	USF
Interview 2	F	39	8	Yes	Yes	UCSP
Interview 3	F	64	38	No	Yes	USF
Interview 4	M	63	37	No	Yes	UCSP
Interview 5	M	67	40	Yes	Yes	USF
Interview 6	M	64	30	Yes	Yes	UCSP
Interview 7	M	60	33	Yes	No	UCSP
Interview 8	M	31	7	No	Yes	USF
Interview 9	M	66	37	No	No	USF
Interview 10	F	65	39	No	No	USF
Interview 11	M	30	5	Yes	No	USF
Interview 12	F	64	38	No	No	UCSP

The sample had 58% of responders prescribing in USF primary health care unit type. It was balanced for previous training in mental health; 58% of responders were male and 58% effectively used the platform. The mean age was 54 years-old and the mean number of years of clinical practice was 27 (Table 19).

Table 19. Distribution of characteristic of interview responders.

Characteristics of primary health care doctors	n (% do total)
Type of primary health care unit	
USF	7 (58)
UCSP	5 (42)
Specific training in mental health	
Yes	6 (50)
No	6 (50)
Gender	
Female	5 (42)
Male	7 (58)
Usage of ePrimaPrescribe	
Yes	7 (58)
No	5 (42)
Age	
mean	54.25
SD	14.88
(min, max)	(30, 67)
Years of clinical practice	
mean	26.8
SD	14.56
(min, max)	(5, 40)

The interviews produced three sets of qualitative data based on the topics explored.

1. Barriers and facilitators to a consistent and long-term BZD prescription trend change

Figure 14 presents a summarized conceptual map of relationships established between the main themes in the analysis. Two main themes were obtained discussing perspectives over changing excessive BZD prescription: Environmental context and resources/organizational context of primary health care settings and subjective external and internal factors.

These two themes were narrated through opposing discourses of barriers and facilitators/solutions. Three other secondary themes emerged regarding the topic of changing BZDs prescription: perspective over the amount of BZDs that were prescribed; reasons for prescription; and perspectives over psychopharmaceuticalization.

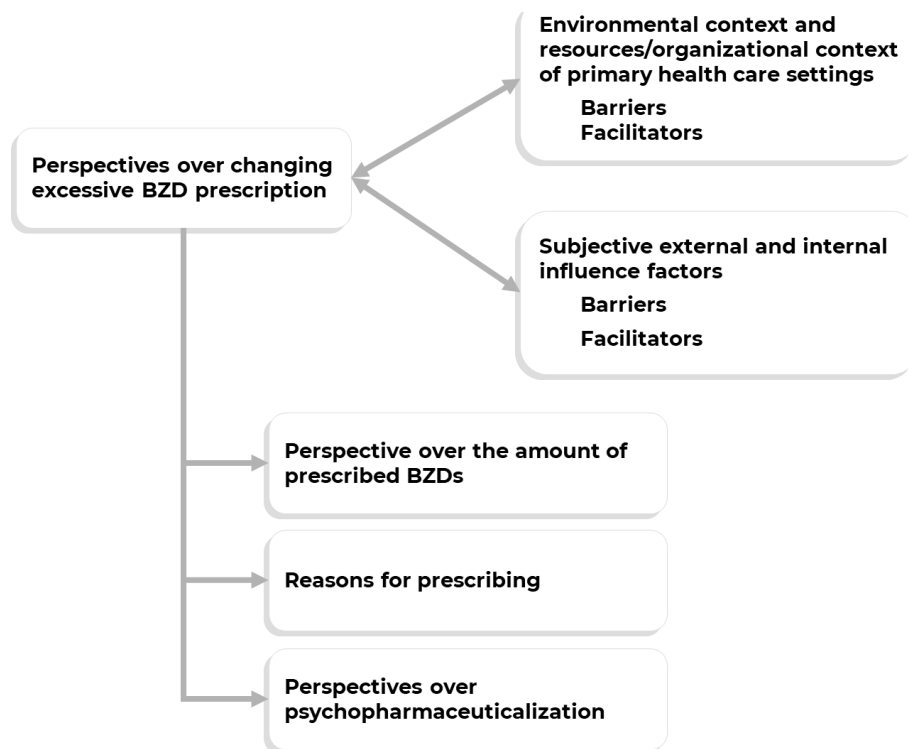


Figure 14. Themes emerging regarding changing BZD prescription.

Environmental context and resources/organizational context of primary health care settings

When elaborating over environmental and organizational context of primary health care settings, interviewees discourse was dichotomized, opposing perspectives regarding barriers and facilitating factors.

As exemplified by the quotes below, narratives regarding the barriers to change BZDs excessive prescription, were mainly focused on the high demand for these medicines related to the perception of a high frequency of mental health complaints or mental health disorders.

"You rarely don't have it in one day, one afternoon, so there it is, one afternoon, it's very rare that you don't have, imagine, uh, out of fifty patients, we have ten or more with these complaints... so you know that, for more immediate relief, it will have to be this medication..."

(Interviewee 2, female, 39 years old, 9 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

"Let's say it's such a prevalent pathology, uh, and so... so everyday, that it seems to me that it's difficult, ham [deep breathing]... I'm not saying there's no indication (to reduce the BZDs), in certain situations, but that it would be difficult for these patients and, and it also seems to me that eventually the results would not be so, so, so different..."

(Interviewee 4, male, 63 years old, 37 years of clinical practice, without mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

"In terms of absolute numbers, I have many problems that have a high prevalence, that, uh, probably leads to my prescription being an increased proportion in this area too, doesn't it?"

(Interviewee 7, male, 60 years old, 33 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

Time management was considered a pitfall factor and generally pointed as one of the main barriers to change prescription. The issue of lack of time was mentioned from the perspective of the duration of consultations, which was considered insufficient, but also of the time GPs had available in their extra working hours to dedicate to mental health matters.

"It is known that, that, that the doctor, that the less time we have, the more tendency we have to medicate"

(Interviewee 4, male, 63 years old, 37 years of clinical practice, without mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

"I think the consultation time has an influence in relation to this type of situation, therefore, the consultation time I think is a factor that can change the approach to anxiety a little bit and in this specific case, uh, there should be at least one, a more refined criterion in terms of prescription."

(Interviewee 5, male, 67 years old, 40 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

Infrastructural barriers, such as limited number of rooms available to perform the appointments, lack of adequate hardware and slowness of software were also perceived as barriers.

"The IT that we deal with in USFs and in the UCSPs, in this case it's the same, the computer, uh, it's a terrible thing because the systems 'are always crashing... uh, if we ask for blood analysis we lose five minutes, to prescribe medication we lose even more time, and sometimes when the prescription is ready, it crashes again."

(Interviewee 5, male, 67 years old, 40 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

Training in mental health was considered insufficient and inadequate, since happening in hospital context instead of integrated in primary health care setting, and this was also perceived as a negative factor influencing GP's confidence to manage mental health disorders. One doctor referred that her lack of interest in mental health issues had a significant impact in her view and attitude when prescribing BZDs and other drugs addressing psychological suffering:

"I confess to you... that in the field of psychiatry I read very little... in psychiatry, uh, I confess that it doesn't give me that much pleasure..."

(Interviewee 12, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an UCSP primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

Despite barriers being predominantly referred, when addressing perspectives over changing BZD prescription, some facilitators were also mentioned.

In some primary health care units, GPs considered having adequate psychiatric support. However, this support was not generalized, and, in most cases, was based in GP's personal relations with psychiatrists, so it was not based on any established collaboration procedure or protocol between primary care and mental health departments.

"The liaison between the psychiatry department coming from the hospital and the primary health care unit, I think that it is a great help, when we feel the car derailing, knowing that they are coming here, in a few days, helps us a lot."

(Interviewee 1, female, 38 years old, 10 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

Some practitioners, with higher affinity and personal interest, had training in mental health and knew how to apply some basics of psychotherapy principles into their clinical practice.

"I probably feel more confident because I did a master's degree in psychosomatics"

(Interviewee 5, male, 67 years old, 40 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

Primary health care was generally considered as the proper place to treat mental health issues such as anxiety and medium/mild depression, but GPs added that more resources are needed due to the high number of patients with these disorders (15).

Subjective external and internal factors

Patient's subjective resistance was globally mentioned as a very strong barrier to BZDs prescription change. This resistance was perceived by GPs as being related to patients' emotional connection to BZDs, to doctor-patient relationships (often connected to time constraints), patients' demands and expectation towards their GP, and perception of lack of understanding over the negative effects of BZDs long-term use.

"I think the biggest problem is really the patients' resistance... If we say "but can we try, uh, changing it [the prescription] to something else, which also helps to sleep?", people, uh, they get really scared!"

(Interviewee 3, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

"When I make these changes, uh, I often explain why there is no constraint, but, already, already, I remember there are people I see, at least I don't know how they will do it later at home, but at least you can see that they are a bit sorry"

(Interviewee 5, male, 67 years old, 40 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

"People are a bit resistant because, uh, they're used to taking that medicine and, and, and they assume that it's going to be difficult to, to, to take it off."

(Interviewee 7, male, 60 years old, 33 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

"It's that mechanism that the person is used to and feels fragile if they don't take it. That is, the person faced with the proposal of "let's reduce the dose, or let's think that one of these days we'll suspend the therapy", ham, I think that, it's the, the person feels a little insecure, with that, ham, like "if, if I interrupt, I'll have symptoms again, or I'll get worse..."

(Interviewee 7, male, 60 years old, 33 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

"Q: Do you feel that sometimes, or I don't know if it happens to you, you feel that the doctor-patient relationship is harmed when you deny the prescription or when you try to suspend the prescription of benzodiazepines? You already told me that it has been difficult with some people... Do you really feel that this relationship is damaged?"

A: It stays, it is a little bit damaged... It can, it may not last forever, but it stays. And then, what happens there, the population is very complicated, the population there in my area, it's very complicated..."

(Interviewee 2, female, 39 years old, 9 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

"It depends on how we establish the relationship with our patient. Ham, and there it is, it's more, one more thing that depends a lot on the available time we have to talk to the patient. Because if we can explain them why we are doing this, there is no harm in the doctor-patient relationship"

(Interviewee 3, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

“They just go back to medication later, or they go back to the open consultation saying that 'so much worse! That's it, and then you have to reassess and maybe you have to start medication again, then you always have a patient who is there every week, always saying the same thing... they get a lot due to tiredness”

(Interviewee 2, female, 39 years old, 9 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

“I think the main barrier is always the person themselves... there are some who show themselves right away, uh, reticent at first say they won't make that effort and won't comply and no, they don't show any openness, although they take explanations in several consultations and of limiting access to benzodiazepines there too, just to try to get them to accept this intervention, I think more than half of them do not even accept or even want to talk about it.”

(Interviewee 8, male, 31 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

GPs reported feeling their role questioned when the initial BZD prescription was issued by a hospital-based specialist, and when patients seek for BZDs prescription renewal with other GPs. In the first scenario, they mention feeling patients were considering other specialist's prescription as having a higher validity and better quality of care; in the second scenario, it makes them feel their effort to change prescription pointless. As a result, in both situations, GPs mention facing the pragmatic barrier of having their patients seeking for BZDs elsewhere (in open medical appointment, or hospitals) when they try to engage them in a withdrawal scheme.

“It's not a general effort, it's not, of all colleagues and therefore, sooner or later, despite there might be a punctual effort (to decrease prescription), soon after the users end up coming with a prescription of benzodiazepines anyway”

(Interviewee 8, male, 31 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

"We try to schedule an appointment, but if they don't see the problem solved in forty-eight, seventy-two hours, they repeatedly resort to emergency consultations, whether here in open consultations, or emergency services, until they have a prescription that acts quickly"

(Interviewee 8, male, 31 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

"People then break the chart, uh, no, no, the doctor doesn't prescribe but there is another one who, let's say, prescribes, let's say, chronic, it's a problem that drags on over the years"

(Interviewee 9, male, 66 years old, 37 years of clinical practice, without mental health training, prescribing at an USF primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

Finally, the social environment affecting the patients' mental illness (marital problems, work, unemployment, loneliness, addiction); the lack of community-based programs and local infrastructure to improve mental health (physical activity, community activities, etc.), and scarce non-pharmaceutical alternatives available to deal with anxiety and depression, are also factors that contribute to the trend of medicating these conditions with BZDs.

"I work with a stable population where the, where the problems, uh, remain, uh, let's say more or less at the same level, right? And that what I usually considered a reason for prescribing benzodiazepines, uh, is still present: aging population, alone, seasonal work problems, uh, litigation problems, litigation or, or, or a bad marital relationship, parenting problems -children, so it remains"

(Interviewee 7, male, 60 years old, 33 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

"The patients, because they have one there, a medication that quickly takes effect and immediately relieves what they feel...then they end up putting a lot of pressure on us to have that medication and then they end up getting used to it"

(Interviewee 3, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

The only facilitator mentioned as external or internal factor was the support some GPs felt coming from psychiatrists, with whom they collaborate to engage patients into withdrawal schemes.

"Q: do you think mild to moderate mental health issues obviously can if, or should be treated, uh, if they can be treated in primary care? If they should be treated in places of greater specialty...?"

A: I think they can. They can, but also, there is, we have to have a bit, a, a support, as we have here"

(Interviewee 1, female, 38 years old, 10 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

Perspective over the amount of prescribed BZDs

The general perspective is that too many BZDs are being prescribed. In some cases, GPs mention they think it was even worst in the past, but that the amount is still very high.

"I think that all of us, at least speaking at the level of General and Family Medicine, I think we have a little bit of this awareness that, uh, more benzodiazepines are probably prescribed than they should, and maybe even longer than they should be"

(Interviewee 4, male, 63 years old, 37 years of clinical practice, without mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

"There have already been some changes, not only because we are aware of the situation, uh, and then we also end up transmitting to patients that deep down it is a... it is a medication that is not to be done as they used to do before. That you need to change, uh, change some of the things they take."

(Interviewee 3, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

Reasons for prescription

The population with more prescriptions is often mentioned to be elder people, especially women, however, other adults and sometimes children are mentioned as well.

Q: And the people to whom you notice you continually prescribe? Who are they, do you have any idea?

A: They are older. They are, they are, that's it, older adults, let's say, yes to older people."

(Interviewee 2, female, 39 years old, 9 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

"Ham, I think they are, it's more, more female and more elderly"

(Interviewee 9, male, 66 years old, 37 years of clinical practice, without mental health training, prescribing at an USF primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

"Even in younger people, where you really feel that there is, that there is abuse"

(Interviewee 6, male, 64 years old, 30 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

Reasons for prescription are often related to elder people sleeping problems, to treat insomnia, anxiety or depressive disorder and for a short period of time.

"Most of them are, they say that if they don't take it they don't sleep... So they were passed on, to put an end to insomnia"

(Interviewee 1, female, 38 years old, 10 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

"They have a lot of difficulty controlling anxiety, uh, and if they don't have a drug that quickly, uh, lower their anxiety level, it's difficult"

(Interviewee 3, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

"Q: are you thus able to identify some characteristics of these people who find themselves continually renewing this type of, of, of drugs?"

A: They are people who, are elderly people, with old depressions..."

(Interviewee 6, male, 64 years old, 30 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

"I prescribe, say, for short periods, or, or associated with, antidepressants in the initial phase"

(Interviewee 9, male, 66 years old, 37 years of clinical practice, without mental health training, prescribing at an USF primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

Most GPs mention they try not to initiate BZDs, and some say ePrimaPrescribe helped to make them more aware and choose other medicines (antidepressants) or spending more time in some appointments to look for alternatives.

"I now, before prescribing the benzodiazepine, I think three times and...and maybe I opt for shorter, more punctual treatments, I spend more time, maybe apart from the consultation itself, listening to the person, working with them, within my technical possibilities, the alternatives or way of dealing with the problems in a different way...therefore, in this aspect, the intervention helped us being more sensible to the subject ..."

(Interviewee 7, male, 60 years old, 33 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

However, there are contradictions about this in some interviews, since at some point GPs mentioned factors influencing BZDs initiation. So theoretically they want to reduce their BZD prescription, but in practice this is not always the case, or there is little difference in the amount prescribed at the time of interview and before.

"In connection with your study, I was curious about the prescription of benzodiazepines in terms of specialties... I asked my new patients who had prescribed these medications first hand. Surprise of surprises: Most of times the psychiatrists and cardiologists..."

(Interviewee 12, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an UCSP primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

Most GPs mention patients often come with prescriptions, or are long term consumers of BZDs, making them feel obliged to continue the prescription to avoid withdrawal problems.

"I think the main problem is ourselves... I think we are, it's what we prescribe and, and that we often don't discontinue"

(Interviewee 3, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

For the specific case of elderly patients, some GPs mention they try to talk patients out of BZDs and negotiate treatment, but that these efforts are often in vain. The reasons pointed out for this were that patients go around to get the prescription from somebody else, that they persistently 'demand' for the pills. GPs also referred feeling it would be too hard for, the elder patients in question, to suffer through withdrawal at their age.

"People eighty-something and ninety sometimes it's not worth it, I mean, I think..."

(Interviewee 6, male, 64 years old, 30 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

In the case of younger patients, GPs make an extra effort not to prescribe, or to negotiate the prescription in adequate timings.

"...because for those new ones we introduce and say "look, just do X time, then when you're better we'll take it out, or..."

(Interviewee 10, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an USF primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

GPs who were more motivated to manage mental health issues in their clinical practice and had better training in mental health, seem to be more aware of prescription problems and alternatives, however this did not seem to translate in a significant difference on the amount that was prescribed.

GPs mentioned the existence of factors they felt as influencing them to initiate BZDs. The reasons mentioned were related to diagnosis: Insomnia, anxiety, depression or depressive states (together with antidepressants); reasons related to organizational and subjective internal and external factors: lack of time in general; lack of time in consultation to talk more to patients and give some sort of psychological support; lack of alternatives within the health system (psychology, etc.) to treat mental health issues; lack of communication with psychiatric expertise when in doubt, making prescribing the easiest way to rapidly solve patients' symptoms; doctors' sensitivity (subjective), working habits, and therapeutic inertia; being too difficult 'not to prescribe'; being worn out and prescribing because it is the less problematic way to 'solve' the problem.

"We don't have time for the psychologist, we practically don't have... Consultation time too..."

(Interviewee 1, female, 38 years old, 10 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

One practitioner referred almost never initiating BZDs, but this was not a general trend (on the contrary).

Most patient's complaints mentioned to influence BZDs initiation concerned insomnia and anxiety, or depression, or both.

GPs recognized that patient's complaints were frequently associated to social and relational factors but considered that their scope of action was very limited beyond the prescription of drugs. The few GPs who mentioned being concerned with these dimensions mentioned some aspects they considered more common: problems at work or lack of employment, marital problems, loneliness (children left/grew up), and addictions.

“What I used to consider a reason for prescribing benzodiazepines, uh, is still present: aging population, alone, seasonal work problems, uh, litigation problems, litigation or, or, or a bad marital relationship, parent-child problems, so it remains”

(Interviewee 7, male, 60 years old, 33 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

Regarding reasons for BZD long-term prescription, the most common motives concern long term prescription renewal in elder people and the suffering withdrawal would provoke on patients.

There were no specific diagnosis-related justifications for long term BZDs prescription. In general, GPs talk about patients that are already medicated and that, for age related reasons, would be too difficult to enrol in a withdrawal scheme. In other cases, they talk about the fact that they do not wish to interfere with other doctor's prescriptions.

“You always have that feeling of indirect speech saying ‘I went to the doctor who gave me this medication that made me better, and I’ve been here several times and you never made me better’, so, way of saying, you know? So there’s that pressure of, uh, we have to be superior or we have to be better doctors, uh, because of, maybe, of, because they feel better, so they think the other is always better, you see?”

(Interviewee 2, female, 39 years old, 9 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

“...and it’s like that, I have a way of working, that’s it, it may not be completely correct, but I don’t take medication started by other doctors”

(Interviewee 2, female, 39 years old, 9 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

Some say that it would be too troublesome to cease BZDs - for time and organizational reasons but also due to patients’ addiction. Among the organizational reasons mentioned are the lack of communication with psychiatry to share doubts and find a correct withdrawal scheme, lack of time in medical appointments or lack of training.

There are some subjectivities and ambiguity in answers versus practice.

“The person... already has little tolerance in all this, is already fed up, I say ‘I’m not going to buy another war, look... if you want, if you want one more Alprazolam or one more Xanax, look, take it’, but I mean, because I already know that if I say no, it’s a problem.”

(Interviewee 6, male, 64 years old, 30 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

Perspectives over psychopharmaceuticalization

Most GPs did not manifest a direct concern over psychopharmaceuticalization. Few GPs made comments regarding this subject directly. A few (two participants) mentioned that over-prescription was part of a socially wide consumerism problem, linked to how people do not allow themselves to have time to grieve, or to deal with the sources of their mental health problems, looking for a quick fix for their suffering and unbalances.

"Consumerism on the part of users, uh, and as such, not having, not having time to talk a little, sometimes this leads to, from time to time, if a person who has a certain type of problem, whether family or work, and maybe with a little conversation the thing, uh, maybe it would be solved and the person could overcome it by themselves, sometimes, due to our lack of time, our tendency is also soon to go ahead with, with an anxiolytic, isn't it?"

(Interviewee 9, male, 66 years old, 37 years of clinical practice, without mental health training, prescribing at an USF primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

"People are not used to living in adversity. Whatever it is. They are not used to having pain and trying to bear it so they don't get drenched in painkillers. And so it's the same, and so the situation is the same with regard to anxiety... because they're not used to, uh, the deprivation of life and the resolution of, of things that we can't give to being doused in medicines"

(Interviewee 12, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an UCSP primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

Some also related the issue of psychopharmaceuticalization to more general structural issues of the health care system, such as lack of psychologists and time for GPs to pay closer attention to the wide number of people with mental health complaints that seek their help.

"When a patient comes to us and we realize 'this patient is, 'he's depressed, this patient's, 'he's anxious', yes, so instead of trying to unravel a little more the, let's say, the things, as we lack time, we have pressure from others who are waiting there, maybe an antidepressant will go right there and then an anxiolytic and then "look, we'll talk again, in here for a fortnight , three weeks", but then the person is no longer able to schedule, or afterwards, that's it, the thread is lost a little, and then there is some tendency to medicate, medicate quickly due to lack of time"

(Interviewee 9, male, 66 years old, 37 years of clinical practice, without mental health training, prescribing at an USF primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

2. Barriers and facilitators for implementing a Digital Behaviour Change Intervention (DBCI) online program contributing to the development of innovative medical educational tools

Figure 15 presents a summarized conceptual map of relationships established between the main themes in the analysis. Two main themes were obtained: general perspective concerning Continuing Medical Education (CME); and perspectives concerning digital platforms designed to Continuing Medical Education (CME), more specifically over the DBCI ePrimaPrescribe. These two themes were narrated through opposing discourses of barriers and facilitators/solutions. Two other secondary themes emerged related to CME discourse: the routine use of clinical guidelines and the training in mental health applied to primary health care setting. The results were contextualized by participant GPs' quotes, their sociodemographic characteristics and participation in the study.

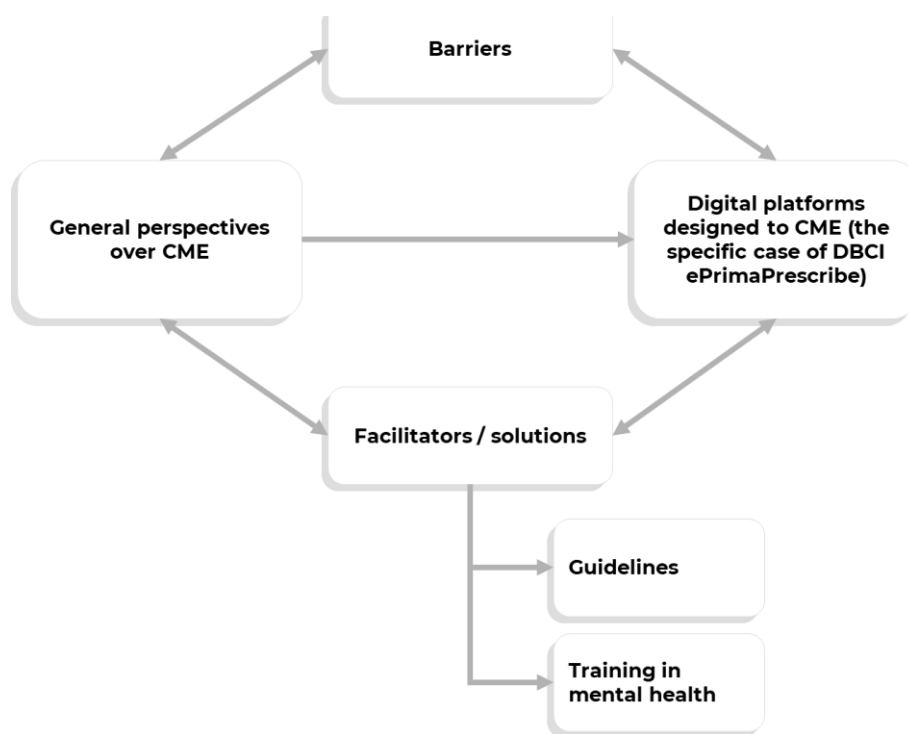


Figure 15. Themes emerging regarding barriers and facilitators of DBCI implementation.

General perspective concerning Continuing Medical Education (CME) in primary health care setting

Barriers

Most GPs consider time the major barrier for continuing training, be it digital or live.

"The excess work we have, I can't afford the luxury of taking off the fifteen days of training we're entitled to a year, isn't it, for, for the free service commission, I can't take them off, because I can't, simply. I don't have anywhere to refer my patients' appointments [if on a leave]"

(Interviewee 2, female, 39 years old, 9 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

Directly related to time management, the accumulation of medical appointments due to absent days spent in training are also identified as a barrier.

"Every time you go away, no, you are not relieved from the work, you are already thinking about what you have already done and what you will find when you arrive again"

(Interviewee 6, male, 64 years old, 30 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

Senior GPs mentioned that interns/residents usually try to comply with training, but they feel it is difficult for them to participate in such events for various reasons: motivation, time, habit (connected with therapeutic inertia), limits between work time and leisure time, saturation from work, or lack of interest in the subject of mental health.

"I understand that older or less patient colleagues no longer have the...motivation to do this type of training"

(Interviewee 8, male, 31 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit, used the ePrimaPrescribe DBCI platform)

"I don't have much patience anymore because I'm going to retire after year!"

(Interviewee 10, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an USF primary health care unit, did not use the ePrimaPrescribe DBCI platform)

While talking about more general trends, some practitioners mention lack of discipline as a barrier, as well as laziness.

"It's a matter of personal discipline, I'm not saying that others can't, I'm saying, for me...it's a characteristic of me that in that aspect I have some difficulty in disciplining myself and saying 'now you'll be here half an hour sitting, or an hour sitting doing this'"

(Interviewee 7, male, 60 years old, 33 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

"Look, laziness! Laziness! Quite simply. We talked about it several times, from, uh, uh, even, I remember that we even had a few sessions where your platform was used, which was very simple"

(Interviewee 5, male, 67 years old, 40 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

Various organizational reasons were also identified, that often overlap with the motivational ones: lack of contact with professionals in psychiatry in some of the cases; insufficient training in the curricula, even during the internship/residence years; the need for GPs to get training in too many different areas, because they are first line in the provision of care - so patients come with very different complaints; too much bureaucracy to handle, leaving little time to training or studying (i.e. keeping updated), and lack of digital infrastructure at the workplace in the case of digital learning (one of the participants printed the ePrimaPrescribe info to consult during medical appointments because he could not access that application and its guidelines/information at work).

"The fields of Family Medicine are many, many, and, and therefore it is difficult to maintain continuous training in, in cardiology, in diabetes, in child health, in, 'you see, in mental health, in, it's this, that, the other. So I think, hmm, they're a lot, they move in many areas at the same time, don't they?"

(Interviewee 5, male, 67 years old, 40 years of clinical practice, with mental health training, prescribing at an USF primary health care unit, used the ePrimaPrescribe DBCI platform)

"The resources we have, informatics and technology, in the workplace, no, they are, they are very poor"

(Interviewee 8, male, 31 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

Still concerning the thematic of general perspectives over barriers to Continuing Medical Education (CME), it is worth emphasizing how three sub-themes emerged recurrently with significant overlap and agreement between interviewees: motivational barriers; emotional barriers; and knowledge/training barriers. Motivational barriers mentioned were: lower motivation after mandatory training period during internship/residency; therapeutic and motivational inertia (habit); lack of time; need for limits between work/leisure time; difficulty to organize schedules with medical appointments, in spite of having 15 days of commissioned training; the emotional barriers mentioned were: need for charismatic presenter and how training with a boring presenter is terrible; onsite training allowing GPs to talk to people/colleagues; lack of self-discipline; feeling guilty for not attending; habit; lack of interest in mental health; saturation from work; laziness (attributed to others); mobility – lack of will to go out for training outside working area.

"It would have to be taught by an interesting person...because there are things that are boring!"

(Interviewee 12, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an UCSP primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

"At a certain moment I realized that I was late... and, and that also made me feel a little guilty... deep down I felt that I was failing"

(Interviewee 7, male, 60 years old, 33 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

Finally, the barriers mentioned related to knowledge/training modality were: insufficient training (overall); too many areas where GPs need training; insufficient time with too much time spent on bureaucracy; impossible to do it all; lack of digital infrastructure on workplace.

Facilitators/Solutions

Many GPs referred that periodic meeting (or workshops) with experts at the primary health care units, to discuss cases and get very pragmatic training would be good. In general, most GPs consider that what would really improve things would be better communication with the expertise needed. Due to time limitations from specialists, some participants admitted that having some onsite training complemented with alternative training delivery methods (such as online platforms) would still be adequate to their routine clinical practice.

“Even sometimes, I don't know, with the patient present and we call: “look, help me here with this issue, I have this patient, like, how am I going to medicate? What am I going to do to you? She's not better, with the medication she's taking, what can she change?” Something like that”

(Interviewee 10, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an USF primary health care unit, did not use the ePrimaPrescribe DBCI platform)

“For me, it would always be more advantageous one, one, one training, even if it was one day a week... or two days a week that I could manage... and at that time I'm just for this... for me it's more profitable than, trying to read, because, and we would be talking to each other...”

(Interviewee 7, male, 60 years old, 33 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit, did not use the ePrimaPrescribe DBCI platform)

“The colleague was doing a psychiatry consultation, uh, near here, or even here at LocalIX, and I could be there for a while watching the consultations. That would allow me to raise my doubts in private, even to clarify them about my own patients”

(Interviewee 6, male, 64 years old, 30 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

“The ideal would be things in person, reduced audience, and maybe with a little more frequency. That is, I don't know, every three months, every two months, talk about it...or remember, or give... training, or even if it was just once or twice a year, but with tools that you could use. I think it would be, it would be what would work out better”

(Interviewee 8, male, 31 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit, used the ePrimaPrescribe DBCI platform)

Additionally, if days for training were secured, hence time for training being protected from other mandatory clinical activities, that would allow a better managing of clinical work (without patients accumulating afterwards). GPs referred that if they had protected time to attend training initiatives, they would be more prone to participate, whether through digital or in person. Some GPs reinforced this idea by suggesting that training should be mandatory.

"Theoretically there should be a part of our working time to, for personal training, hmm, to read articles, including distance training, which nowadays is often more practical, hmm, and more economical, hmm, in practice. Speaking for myself, I spend, um, ninety-nine percent of my professional time seeing patients"

(Interviewee 7, male, 60 years old, 33 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

"I don't know, if this comment fits here. I think that, in our training, over the years, maybe there should be mandatory training, right? ...if we were somehow obligated, in quotes, I don't mean doing training all the time, but if there were some things that were mandatory, I'm sure people would go there, would do it, whether through... of platforms, whether it was otherwise, isn't it?"

(Interviewee 3, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an USF primary health care unit, used the ePrimaPrescribe DBCI platform)

Better contact and articulation with specific areas, such as mental health expertise, were generally valued, more time secured for training and better organizational dynamics protecting that time as well.

"We have the liaison psychiatry that helps a lot. I think that part of being able to have direct contact with the hospital...with the hospital colleague...certain doubts, anxieties...would help"

(Interviewee 1, female, 38 years old, 10 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

Some GPs suggested training in alternative non-pharmacological approaches, but in general, training focused on medications/prescribing and deprescribing processes was mentioned more often.

"I think it would have to be more, uh, more practical, let's say, it would have to be a more practical training. I'm not saying that no to the issue of pharmacology and all of this, but, uh, it should be a thing, uh, eminently practical, with, comprehensive in relation to the various types of treatments that exist, therapies that exist, but it would be more, more practical"

(Interviewee 4, male, 63 years old, 37 years of clinical practice, without mental health training, prescribing at an UCSP primary health care unit, used the ePrimaPrescribe DBCI platform)

One GP suggested that courses could provide incentives, recognition, awards, to motivate GPs to attend.

"I'm not talking about, pecuniary prizes, but some recognition... Ham, be recognized, isn't it? To be, ham, therefore, derive some personal benefit from it in terms of, of, of personal satisfaction, of honor"

(Interviewee 5, male, 67 years old, 40 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

Perspectives concerning digital platforms designed to Continuing Medical Education (CME) and specific perspectives over the DBCI ePrimaPrescribe

Barriers

When specifically comparing digital continuing training to other forms/delivery methods of training, most respondents preferred onsite sessions instead of online courses. The reasons presented were a general feeling of better learning, and an easier way to keep concentrated and avoiding distractions. It was also referred that onsite training, such as conferences, allowed GPs to escape routine, and an easier time management since there is an easier establishment of limits between work and off-work time.

"It costs me a lot less to go to a course and I learn a lot more from the experience of going to a face-to-face course, than reading...I like new technologies...but I personally, uh, I disperse a lot..."

(Interviewee 1, female, 38 years old, 10 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

"A training like three days just for, three days or a training for some time only allocated to, for, for me, in my way of seeing more in person... these two days I'll be there, I'm going to be focused on this and without being worried where next I'll have to go to, to this place, or to some other place, or to do this or that"

(Interviewee 7, male, 60 years old, 33 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

In general, most respondents opted for live training justifying their choice with the fact that it is easier to manage time and organize their medical appointments accordingly. They generally agree that digital aid could improve the accuracy of therapeutic management, but often lack the will and sometimes the skills to use it.

"I prefer one with, training with the person present...no, things on the internet, no, don't invite me"

(Interviewee 10, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an USF primary health care unit, did not use the ePrimaPrescribe DBCI platform)

"What I prefer is, it's courses like, workshops, or, or face-to-face courses, where, uh, face-to-face courses or workshops. Ham, then maybe, ham, conferences or meetings. Ham, then maybe online training"

(Interviewee 11, male, 30 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

While some use digital learning applications, respondents tend to find digital learning (through videos/reading) less efficient: GPs consider onsite training more productive and beneficial, in particular if training is oriented towards practical issues or clinical case discussions in loco. Most consider lack of time the main barrier to use digital learning tools, which is also a trend when considering CME at large.

Motivational barriers overlap with personal scheduling and priorities. GPs mention feeling overwelled, especially when they try to establish a limit between work/leisure/family time and the large amount of work/medical appointments.

"Afterwards, at home, few colleagues have the will or patience to go open another platform and see something else... they were and are too fed up with work to go do or think about work when they get home"

(Interviewee 8, male, 31 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit, used the ePrimaPrescribe DBCI platform)

Also, the lack of openness to digital tools in terms of preference but also of skills. As previously mentioned, and reinforced as a major influence on motivation, live in-person training, such as conferences enable people to escape routine, digital tools do not.

"If I want to take an online course, I'm not going to ask for a free service commission to take the course online, am I?"

(Interviewee 11, male, 30 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

Organizational barriers such as lack of proper hardware at work to use digital platforms (internet, computer's configuration).

"if we could just get into the course in my workplace and see things here..."

(Interviewee 8, male, 31 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

Some barriers related to skills were also mentioned, such as lack of digital savviness because of age. Senior GPs find digital tools challenging due to lack of knowledge on new technologies and long-term working habits. There is the idea that younger professionals tend to be more motivated to use digital tools than older ones.

"Because the number of platforms that we now have to use is a brutal thing and we don't often have, uh, I, in my case, don't have, no, everything I know in terms of computers and information technology"

(Interviewee 6, male, 64 years old, 30 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

"Because I always have to look at a lot of things on the computer, uh, I'm not an individual who has much experience in using computers and it bothers me a bit to be watching, having to look at the screen"

(Interviewee 6, male, 64 years old, 30 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit, used the ePrimaPrescribe DBCI platform)

"I don't like things online...I'm old"

(Interviewee 10, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an USF primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

Specifically concerning ePrimaPrescribe online platform, most participants find it a good idea, but very few used it. GPs pointed as reasons for this fact their self-perceptions as GPs and the idea that they should decide on patient's treatment according to their sensibility, and reasons related to organizational factors such as lack of proper infrastructure at work and need to use the online platform during their free time.

"I tried to get into USF X at the time...and I couldn't...and then there was no sound and then I couldn't load...and then it was blocked...and therefore, the accesses I ended up doing were at home... and then when I needed it at the I work, to clarify any doubts... I couldn't use it"

(Interviewee 8, male, 31 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit, used the ePrimaPrescribe DBCI platform)

In one case the GP stated her dislike for psychiatry/mental health as a motivational barrier to use the platform (citation grounding this perception already previously presented by GP directly mentioning her dislike over the theme of mental health).

The idea that GPs should spend more time updating but do not have enough time was again addressed when specifically discussing ePrimaPrescribe online platform.

One GP mentioned how, for himself, trying to do many things at the same time was in itself anxiogenic, and so he did not try ePrimaPrescribe at all, because of feeling guilty about not using it right away after the psychiatry expert's presentation. Saturation of work and need for/protection of free time was also mentioned (citation grounding this perception already previously presented by doctor directly mentioning how being late on the platform usage led to guilt and frustration resulting in not wanting to use it anymore).

Facilitators

In terms of digital learning at large GPs see it as responding to the need to be updated.

"Q: But in terms of online platforms, have you ever used...? Do you think they can somehow have a place in the continuing education of family doctors?"

A: Yes, I think so, I think it's one, it's a good one, it's a good option, especially for these issues of time and travel. It can even be done anywhere, anywhere..."

(Interviewee 11, male, 30 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

Regarding ePrimaPrescribe, the practical context/cases is often characterized as very good, and some GPs felt sorry for not being able to finish the training.

Mental health and BZDs prescription is an area where most GPs consider having doubts. Some GPs mentioned the platform made them more aware, while others considered it changed their prescription behaviour.

"It's an area where we generally have doubts..."

(Interviewee 2, female, 39 years old, 9 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

"Probably that I now, before prescribing the benzodiazepine I think three times"

(Interviewee 7, male, 60 years old, 33 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

Younger doctors, with more digital skills seemed more prone to use it.

"I might prefer things online, because I can access it more easily"

(Interviewee 8, male, 31 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

Some health unit's teams spoke collectively about the ePrimaPrescribe platform, one of them had presentations of ePrimaPrescribe modules at work, where the health staff that had not used the application took a lot of notes. In one case one GP printed the practical indications and used it in consultation as a source of information.

"Dra X eventually gave a presentation on one of these modules... that was it, and there were people who hadn't read it yet. They took a lot of notes..."

(Interviewee 5, male, 67 years old, 40 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

Solutions

Regarding digital tools there are some features mentioned as possible solutions for increased use, such as, platform utilisation being mandatory, having protected days for training (properly organized so that there is no over-accumulation of patients), having a nice interface and a simple structure.

"First of all it was, it was, uh, easy to access even for those who don't know much about computer stuff"

(Interviewee 3, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

The fact that there was an onsite presentation of ePrimaPrescribe made a difference in the decision of GPs to use it or not, since most of them received invitations by e-mail that they mostly ignore.

"Your attitude, for example, of coming to us and wanting, uh, to improve our training in this area, so, uh, establishing these links between psychiatry and family doctors, 'so, in a way, if that happened in a systematized way and, therefore, and not only with your good will, but in a systematized way, it would serve as a continuous training..."

(Interviewee 5, male, 67 years old, 40 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

"The way of learning that I prefer was to have a meeting with the doctors, a small presentation there for half an hour, forty-five minutes, trying to explain, that's it, to try to motivate people a little, to use less or to give other alternatives, uh, and then giving, that's it, again giving bibliography that people could consult or, or other, other means, or even other online courses"

(Interviewee 11, male, 30 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

Perspectives concerning guidelines in clinical practice

Clinical orientation guidelines emerged as a secondary theme included in the narrative discussing CME. Most GPs talked about the gap between what is included in clinical orientation guidelines and is possible to implement in daily practice.

"...practice, always wins over theory"

(Interviewee 2, female, 39 years old, 9 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

"The lag sometimes is this: We try to do what we think is most correct, but then the user, lets say in quotes, turns us around"

(Interviewee 3, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

Some of them read these clinical orientations, most know about them, but the majority did not know their content extensively. Some consulted them while studying but did not know if that was the latest version, others get 'a bit lost' in the documentation, others try to comply with orientations' recommendations but then the patient demands otherwise, and yet others do read/consult them periodically to make sure they are updated on the latest standards. Nevertheless, particularly in cases where the patients come to renew a prescription, GPs mention it is difficult to follow guidelines.

Most GPs consider it would be good to have more practical indications, oriented to daily practice.

Some GPs do not read the clinical orientation guidelines at all, just some theoretical texts, or rely on their own ideas. Some GPs mention perceiving the number of guidelines as excessive, hence being difficult to keep updated about everything.

"There may be a lack of content updates and new guidelines and all that, especially at my primary health care unit, so this can happen. Ham, maybe I'm not even aware of the guidelines that have come out lately."

(Interviewee 2, female, 39 years old, 9 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

"In General Practice, uh, our guidelines fill half a dozen files, don't they?"

(Interviewee 7, male, 60 years old, 33 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

Perspectives concerning training in mental health

Perspectives over training in mental health were divided between GPs that had specific training in mental health and GPs that didn't have any specific training.

For doctors with formal training in mental health, in general, the duration and content of training was considered inadequate. Most GPs referred considering their training too short

and distant from primary health care setting since it happened integrated in general hospital's psychiatry departments.

"I think the training time could be a little longer, yes. Ham, here the question is whether training, uh, is always given, uh, (isn't it?), in a hospital environment, and is very focused on, on issues that, that colleagues in psychiatry see at the hospital setting"

(Interviewee 3, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an USF primary health care unit type, used the ePrimaPrescribe DBCI platform)

Doctors without formal training often referred having updated their knowledge in this specific area through training sponsored by pharmaceutical companies on specific medicines, but mention feeling these sessions as biased, manifesting preference for the organization of training by an independent organization or by the health system (ideally).

"...situations that exist sometimes have the stamp of, of industry, isn't it...? ... and that, therefore, sometimes it is not completely what is intended, but rather the advertisement of a certain drug, or something like that. I think there should be more initiatives on the part of the tutelage"

(Interviewee 9, male, 66 years old, 37 years of clinical practice, without mental health training, prescribing at an USF primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

GPs, in general, advocate for more practical training, focusing on medications, alternatives to BZDs, and on specific pathologies (e.g., dementia, where GP find themselves a bit lost and resort to the private sector). However, participants considered even better to have more articulation with psychiatry specialists, or more 'shoulder-to-shoulder' appointments.

"probably put one, put a period of time, uh, small, with direct support from a psychiatrist (...) to clear any doubts at any time during the work period, uh, yes, probably, uh, small group meetings of information from you, like, as the colleague did. Come here, talk to us, right? But things, but something very, how shall I say, very concentrated and very, to have like half an hour or several, once of, of, a month, or that, an hour or an hour and a half in which we were just there to clear up the doubts..."

(Interviewee 6, male, 64 years old, 30 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

There is a general consideration that interns/residents are more focused in training, while senior practitioners and younger ones already established as GPs not so much. In practice, knowledge often circulates between interns and specialists, but specifically considering mental health issues/knowledge this does not seem to happen much.

"If I had interns, I believe that, as they need to update themselves, they would update us too"

(Interviewee 2, female, 39 years old, 9 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, used the ePrimaPrescribe DBCI platform)

In clinical practice the component of team learning seems very relevant (i.e. learning from each other in a team, knowledge circulation as situations appear).

"They could also do a pre-nursing appointment, which they already have, they could even apply some scales, or even ask the person a few questions, 'how are you doing with the medication, how are you feeling, do you have any doubts...', then when the person went to the medical part, the consultation would start a little more prepared"

(Interviewee 11, male, 30 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

As already mentioned earlier when addressing medical training in a larger perspective, there is a general preference for onsite training instead of digital (including short courses and conferences), and wide preference for periodic meetings/workshops at the health units to get training/share experiences/discuss cases. Conferences were referred as one of the preferred training delivery methods. It was highlighted the need for the speaker to be captivating and that the content should be focused on clinical practice. Notwithstanding, the reasons mentioned for this preference differ from senior to junior doctors. Senior doctors mention they prefer onsite training due to technical difficulties and personal preference; junior doctors seem to prefer onsite training as a way of assuring the protection of their time.

Learning often happens from contacting expert colleagues, and more access to these professionals is considered a good improvement.

Discussion of partial results

Barriers and facilitators to a consistent and long-term BZD prescription trend change

The primary context and “local world” chosen for our narratives was GPs’ perspective over BZD prescription after implementing an intervention aiming to change their prescription pattern. The interview’s narratives focused primarily on the environmental and organizational context and resources, and subsequently on wider subjective external and internal influence factors for BZD prescription patterns. These two themes were organized as discourses regarding barriers and facilitators to a consistent and long-term BZD prescription trend change.

The environmental and organizational context of primary health care settings was perceived as a barrier to changing BZDs prescription trends. Previous research also points generally in this sense, through the presentation of arguments such as the continually changing work context, and GPs’ desire and responsibility to help their patients balanced with experienced limitations to propose alternative interventions (3).

Collaboration with specialists was discussed both as a facilitator and a barrier. In some cases, it was reported that the existence of continuous articulation with psychiatry specialists was crucial to allow for BZDs discontinuation. The articulation with psychiatry has been considered in the Portuguese Mental Health Plan as a pillar to improve adequate access to care (16). However, this articulation was reported in our data as occasional, based on personal

relationships and associated to a high variability, fragmentation of care and inequity of access of care by different populations. A similar perception over the articulation between primary health care and psychiatry has been previously documented in similar settings even when service organizations are very different (17).

GPs in Portugal have a few months of mandatory training in mental health during their residency. Our participants report perceiving this training as insufficient and inadequate, especially if considering the changing context of primary health care practice, which is often described by GPs as overwhelming, due to the need to know how to manage different medical areas (3). Previous research addressing the problematic of excessive BZDs prescription are in agreement with our findings, mentioning that GPs perception of insufficient training was associated to feeling powerless and unable to change their prescription (17).

Regarding resources, GPs mention infrastructural barriers, such as lack of adequate consultation rooms, lack of computers and software limitations as negatively impacting their general experience in approaching mental health issues during appointments, particularly when attempting to change BZDs prescriptions. We could not find any significant literature mentioning specifically infrastructures as barriers to change BZD prescription. This might mean that this issue is specific to the Portuguese reality, or that previous studies didn't address the factors influencing BZDs prescription with enough coverage so this thematic could emerge.

Our findings were in alignment with previous research suggesting that BZDs prescribing decisions are complex, uncomfortable, and demanding, particularly when taken within the constraints of daily general practice. A study by Bendtsen, published in 1999, explored in depth the quality of dilemmas experienced by physicians when prescribing BZDs (18). In this study, the reasons related to experience dilemma when prescribing BZDs (such as disturbed doctor-patient relationship, patient's expectations regarding continuing the prescription initiated by a psychiatry specialist, lack of time to look for alternative interventions), were in agreement with the barriers reported in our results, suggesting, once more, the validity of results found in our study. GPs vary in the extent to which they were willing to prescribe BZDs, and individual GPs' approaches to propose withdrawal were also varied (19). GPs were ambivalent in their attitude towards prescribing BZDs and inconsistently applied management strategies for their use (20). This was reported to be related to different perceptions of the role and responsibility of the GP, variation in GPs'

attitudes to BZDs, perceived lack of alternative treatment options, GPs' perception of patient expectations and doctor-patient relationships (3).

Time was discussed as a pitfall, limiting doctors' availability and capacity to implement alternative interventions to BZDs prescription. This barrier was closely connected to both perceived high demand and high prevalence of mental disorders. These results were in accordance with the literature, since research has documented GPs resort to BZD because of time restraints (1,21).

Patient's pressure to keep BZDs prescription was felt as one of the reasons for long-term prescription, and it was referred that the majority resisted very strongly to any proposal to change it. This resistance is largely reported in literature addressing GPs' perceptions (1), and a study by Linden in 1998 also addressed insistence and BZD craving (22). This study provides evidence for drug-seeking or craving behaviour of patients who receive low-dosage BZDs prescriptions, and states that a major problem in BZDs withdrawal might occur even before the proposal of a withdrawal program. However, we should question how this resistance is (if it is) approached. In a study by Parr et al., patients reported as barrier the perception that their doctor was unsupportive (e.g. had not given them sufficient assistance; continued to write prescriptions; never questioned whether they were still needed; swapped from one BZD to another if there was no significant improvement; or did not answer questions) (20). Also, there is evidence showing that GPs have high levels of scepticism regarding nonpharmacological approaches to the treatment of conditions such as anxiety and insomnia (23), that patients have a low level of knowledge regarding reasons for taking BZDs (24), and that a large proportion of users might never have been adequately informed about BZDs adverse effects (25).

GPs report that having BZDs prescription decision shared with a specialist, with patients obtaining prescription in various health settings, represents a barrier to changing BZDs prescription, which is in agreement with a previous 13-year follow up study, which showed that this was one of the three factors associated with long-term BZDs utilization (26). In our participants' narratives, despite assuming to be their role to manage common mental health issues, as previously mentioned, GPs often attributed responsibility of initial BZDs prescriptions to other specialties (mainly hospital based). This narrative is also found in other studies (27), and suggests that GPs might have difficulties defining their self-perceived role for managing mental health issues. Prescribing is often seen as a mitigation to the difficulty

of acting in mental health disorders in primary health care settings (17), hence possibly leading to a particular level of prescribing inertia.

Besides the two main discussion topics previously presented, three other secondary themes were addressed: perspective over the amount of BZDs that are prescribed; reasons for prescription; and perspectives over psychopharmaceuticalization.

Regarding perspectives over the amount of BZDs that are prescribed, the perception that the prescription was still very high is in accordance with the most recent national data (28). Again, our participants mention in this context hospital-based specialists (especially psychiatrists and cardiologists) as responsible for most of the initial prescription. This perspective is not in agreement with the real proportion of prescriptions issued outside primary health care units, which was less than 20% of the total prescriptions issued by the public sector (29). It is interesting to verify the specific reference to cardiologists, however, understandable, since common symptoms of anxiety might in fact express through complaints such as chest pain or accelerated heart rate. This perception also contributes to a sense of externalization of responsibility in continuing prescription, as if in the specific case of BZDs it would be possible for the GPs in some way to detach from the prescribing act.

The profile of patients to whom BZDs are prescribed is in general coincident with studies addressing these areas of research, and with results from our effectiveness intervention study. Elders and females are perceived to more frequently prescribed with BZDs (30–32). Regarding prescription to elders, this fact might be explained by the higher prevalence of insomnia, anxiety disorders and organic conditions they present, together with a more frequent demand for medical attention (31). Concerning prescription to females, there could be various explanations to this finding: most epidemiological studies in the community show a prevalence of psychiatric disorders which is two to three times higher in women than in men (15,33); differences in access to the health system, since women tend to consult more frequently with their doctors than do men; differences in symptoms presentation, since women might present anxiety and depressive disorders with complaints which are easier for GPs to interpret and identify; and different approaches from the health professional (1).

When asked for specific reasons to prescribe, participant GPs often mentioned organizational, environmental and external and internal influence factors previously discussed, but also specific diagnoses, that were often incorrect. This finding is in line with literature reporting that GPs often diagnose incorrectly mental health issues and

consequently choose to institute inadequate therapies for the treatment of symptoms and problems presented in consultation (34).

The specific situation of prescription for a short period of BZDs combined with antidepressants in the beginning of treatment of depression was often reported. A Cochrane review addressing combined antidepressant plus benzodiazepine therapy (35) showed this option was more effective than antidepressants alone in improving depression severity, response in depression and remission in depression in the early phase. However, these effects were not maintained in the acute or the continuous phase. Combined therapy resulted in fewer dropouts due to adverse events than antidepressants alone, but combined therapy was associated with a greater proportion of participants reporting at least one adverse effect.

Finally, concerning the narratives discussing psychopharmaceuticalization, the participants did not deeply elaborate on this matter, even when, in some cases, directly questioned. The discourse was primarily focused on more concrete aspects of this theme, such as the usage of medication to manage mental health issues being a direct consequence of the lack of resources such as access to psychologists. Notwithstanding, participant GPs indirectly but repeatedly addressed the issue of psychopharmaceuticalization when relating complaints that influenced BZDs initiation with social and relational factors, and when mentioning as a barrier to change excessive prescription due to the perception of a high frequency of mental complaints and of mental health disorders. Thus, the results from our content analysis concerning the barriers to changing prescription issue, and contextualized in the theoretical framework presented in sections 4 and 5 of our introductory chapter, allowed us to ponder over two main dimensions in the analysis of the social phenomenon of the prescription of BZDs, which were previously formulated by Zóximo (9). The first dimension seeks to identify the relevance of the medicalization process of everyday life in explaining the high prescription of BZDs by doctors. Our participant GPs reference to problems at work or unemployment and marital problems justifying the prescription directly relate to this domain. This first dimension then seeks to understand the influence that health care, more specifically the influence of primary health care organization and perceptions of their actors – in this case GPs - on the relief of symptoms of anxiety, adjustments disorders, sleep disturbances and even nervousness. This dimension explores the changes in the way one looks at the individual, especially in the different ways of assessing his psyche and behaviour, and in the different ways of determining what is normal and pathological. Hypothetically, the prescription of these drugs, as they are so wide, may constitute a grey area of diagnose

uncertainty, as suggested by Whyte (36). In this sense, and based in our results, we suggest that both the frequency of diagnosis identification (referred as the perception of a high frequency of mental health complaints or mental health disorders), and the criteria for diagnosis identification might profoundly influence GPs perceptions. The second dimension aims to grasp the different therapeutic ideologies that may underlie the barriers to change prescription of these drugs. It is our hypothesis that, in the act of prescribing, different beliefs may be present regarding as to the efficacy of BZDs and other ways of treating psychological distress, that justify their predilection, since in all dimensions of medical action the drug was given as the most important therapeutic resource available to doctors (36,37). In a context of decreased consultation time, justified by the logic of optimizing the Public Health Care Provision, the shortage of GPs and psychiatry specialized doctors due to their weak and slow generational renewal, and the pathologizing of psychological traits, the prescription may be the most effective strategy doctors find to cope with the growth of these health needs by preventing the onset of early symptoms through prescription (9).

Barriers and facilitators for implementing a Digital Behaviour Change Intervention (DBCI) online program contributing to the development of innovative medical educational tools

The primary context chosen for our narratives was General Practitioner's perspective over the implementation of a DBCI aiming to change BZD prescription pattern. The interview content over this topic was enlarged to narratives that emerged discussing Continuing Medical Education (CME) in the primary health care setting and the possibility of delivering CME through online platforms such as the DBCI ePrimaPrescribe.

CME was perceived as needed but some barriers were identified, which overlap with great consistency between interviewees and with reports from the literature (38).

Continuing Medical Education (CME), defined as any and all the ways by which doctors learn after formal completion of their training (39), is a systematic attempt to facilitate change in physicians' practices (40). Efforts have been made to promote physician's participation in CME, assuming that if physicians were up to date, they would change and improve their practice, resulting in better performance and ultimately better patient care. A meta-analysis aiming to determine the effect size of CME interventions on physician knowledge, physician performance and patients' outcomes found that the largest effect sizes were found with multifaceted educational programs, longitudinal workshops, interactive small groups, and case discussion interventions, delivered to single discipline participant type (41). Studies

show that besides the larger effect size, these are also subjectively the type of interventions that doctors prefer to attend (42), indicating a strong relationship between motivation and emotional influence on outcomes. However, studies continue to demonstrate considerable gaps between the real and ideal performance and patient outcomes (43), making it pertinent to study the factors influencing this fact.

Time, contextualized in the difficulty of managing clinical routine demands was perceived as particularly challenging and consistently referred as a barrier to accessing CME. This barrier is also mentioned in the literature and pointed as one of the main reasons for GPs nonattendance to CME (44).

GPs feel, in general, that their training is overall insufficient to handle the variety of clinical situations they must solve, being in first line of medical care and, consequently, that they need to get continuing training in many different areas. This perception when confronted to the lack of time leads to feelings of lack of discipline, laziness, and of guilt and saturation from work.

Older age and larger clinical experience were frequently referred as a negative influence factor for GPs' availability to training, suggesting that the opposite, hence that the younger age and lower number of years of clinical experience would be associated to higher levels of motivation to attend CME. However, this might be only true for GPs during residency/formal training period, since narratives coming from interviews with young specialists already incur in a similar discourse to older doctors, pointing to time limitations as a significant barrier to CME. The existing literature regarding age and clinical experience is in accordance with our findings, pointing to other factors, such as time and perception of work overload, to more significantly and transversally influence doctor's compliance with CME (45).

Interviewed GPs consider that CME effective attendance and outcomes would be facilitated if delivered through periodic meetings with practical and pragmatic discussion of cases with specialists. This perspective is coincident with literature documenting the type of intervention with the highest effect size in CME interventions (41), as previously mentioned, however it has to be highlighted that evidence shows this type of intervention, although effective, loses its impact after a few months (46). Hence, in a pragmatic and practical cost-effective perspective it is not feasible to suggest implementation of live onsite regular training from every medical specialty as a feasible solution. This issue emerged spontaneously in some

interviews and the solution pointed by some participants was the possibility to complement onsite training with alternative training delivery methods such as online platforms.

Another key solution pointed by participants was for CME to be mandatory. In fact, the aspect of “forcing the change” is a significant aspect of our narratives translated by a common perspective that CME implementation would only be possible through implementation of obligatory training (47). Participant GPs point this hypothesis as the only way to protect training time after residency, which is also in accordance with other countries experience (48,49).

Considering the preferred CME delivery method, relating to its acceptability and integration into practice of innovative CME methods (such as online training), the general perspective of our data is coincident with references in the literature, indicating a preference for live training due to the value of personal interaction and the perception that CME that did not involve personal interaction was adjunctive (50,51). This is a rather interesting future research subject to be questioned after the COVID-19 pandemic, since it was a period when there was an exponential use of new technologies to support clinical practice.

Specifically addressing online CME, as previously mentioned, this is not the preferred method and this fact is in alignment with literature (52). Time management was even harder with online CME since participants mention they were only able to attend this type of intervention on their free time.

Lack of digital savviness and lack of proper hardware at primary health care units were also mentioned as an important barrier to online CME implementation and acceptance, especially for older doctors. This finding is supported by evidence, reporting that older GPs with more years in clinical practice were less likely to have access to or to use computer-based technologies (51,53). However, as previously pointed this might be a changing reality, directly pushed by the current pandemic global situation that forced, for example, older doctors that refused, due to habit or inertia, to use new technology to adapt and integrate online communication in their clinical practice. Indeed, the idea of the need for a “forced or mandatory” change as a fast way leading to desired/effective outcomes was reflected both in our participant’s perception and in the literature (47,49). Participants reported that acceptance of online training would improve if preceded and periodically accompanied by onsite training, onsite practical discussions with specialists or, at least, an initial presentation of online materials.

GPs often mentioned emotional barriers limiting their compliance to CME, such as the perception of work and bureaucracy overload, saturation from daily work, and guilt. This points to a general underlying negative perspective regarding a low satisfaction towards their daily clinical role and performance, that we might consider inevitably jeopardizing motivation to attend CME, regardless of the type and content of the training. There is scarce evidence regarding GPs' satisfaction or burnout as an influence factor to CME compliance. A recent study discussed the association of GPs' wellbeing as an important influences factor to quality of care, GP prescription patterns, patients' adherence to medical treatments and patient satisfaction (54). Other evidence discusses reasons to a general feeling of unhappiness and dissatisfaction, reporting that when doctors gather, their conversation turns to misery and talk of early retirement, and suggesting that the cause, that in some way is also found in our data, might be a breakdown in the implicit compact between doctors and society: the individual orientation that doctors were trained for does not fit with the demands of current healthcare systems (55,56).

Perspectives concerning compliance to guidelines in clinical practice emerged as a secondary thematic in the narrative while discussing CME. Most GPs reported the existence of a gap between clinical orientation guidelines and what was possible to do in routine clinical practice, a fact that is reported in international literature, where is documented opposition to its utilization in daily practice (57), is suggested that guidelines not always adequately incorporate patient preferences, needs and abilities (58). Still concerning this mater, Cabana, in a review published in 1999 found important barriers to guidelines implementation, such as lack of awareness, lack of familiarity, lack of agreement, and inertia of previous practice (59). Similar results were reported in a recent research performed in Portugal, which documented difficulties to follow guidelines in situations such as prescription initiated by a specialist (60,61). Concerning our research subject, the problematic of excessive BZD prescription, some specific barriers were identified to guideline implementation, such as lack of training in mental health, time to dedicate to appointments were patients presented mental health complaints and the lack of alternative resources to immediate prescription to symptoms relief (62).

Finally, perspectives concerning training in mental health also emerged as a secondary theme while discussing CME at large. The majority of GPs in Portugal currently practicing in primary health care settings had 2-4 months of specific training in mental health integrated in their residency/formal training period as specialists. Our participants' perspectives

overlapped largely when mentioning that this training was both insufficient and inadequate since, with rare exception, it was purely observational and occurred in a hospital setting. We considered that this specific training problematic should be addressed, and participants again suggested as solution the integration of compulsory CME focused in common mental health disorders and integrating primary health care with liaison psychiatry, which in agreement with evidence (49). This problematic might be generalized to discussion, since, in Portugal, most training (and often the only) offered to GPs during their compulsory residency training occurs in the hospital setting, probably detached from their daily routine clinical practice.

As a final discussion remark, we verified that three of the most specific themes seem crucial and transversal to both the problem of excessive prescription and to CME. The first was the general perception that despite the low compliance to intervention, most participant GPs valued the benefits of being included in our intervention and considered that their participation at least increased the awareness over the problematic of excessive BZD prescription. This perception is in accordance with the literature reporting that despite CME is considered to be an essential life-long process for GPs, changing behaviour is generally seen as an incremental, evolutionary process with reinforcement of knowledge from different sources, with single events perceived to rarely effect significant changes (38). The second was time, which seems to serve as justification to GPs to neither discontinue BZD prescription, even if they recognize the inadequacy of this preceding, nor to comply with our (or even any) training. Specifically, to this matter, time was equally mentioned by junior and senior GPs. The third was the need to have protected time to comply with behavioural or any kind of intervention. This overlapping concern around the topic of time, largely supported by previous research which points the lack of time as the most important factor influencing GPs perceived self-efficacy, accentuates the need for time protection and careful management to a definite improvement of quality of care in primary health care settings.

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5.2. Manuscript 3: Barriers and facilitators for implementing a Continuing Medical Education intervention in a primary health care setting

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Abstract

Background: Continuing medical education (CME), as a systematic attempt to facilitate change in General Practitioners' (GPs) practices, is considered crucial, assuming that if physicians are up-to-date, they will change and improve their practice, resulting in better performance and ultimately better patient care. However, studies continue to demonstrate considerable gaps between the real and ideal performance and patient-related outcomes. The objective of this study was to explore GP's perception of the factors affecting the implementation of a CME digital platform in a primary health care setting.

Methods: Our work is framed in a larger effectiveness-implementation hybrid type 1 study, where a Digital Behaviour Change Intervention (DBCI), called ePrimaPrescribe, was

developed and implemented with the aim of changing benzodiazepines (BZD) prescribing patterns. Our design used mixed methodologies to obtain an enriched knowledge on GPs' perspectives on the facilitators and barriers to implementing a Digital Behaviour Change Intervention (DBCI) applied to CME. To do so, we used data coming from an onsite questionnaire, an adapted version of the Barriers and Facilitators Assessment Instrument (BaFAI) and in-depth interviews.

Results: From the 47 GPs successfully included in the intervention arm of our cluster-randomized effectiveness study, we collected 37 onsite questionnaires, 24 BaFAIs, and performed 12 in-depth interviews. GPs reported as the main barriers to CME a lack of time, a perception of work overload, a lack of digital competence, a lack of digital infrastructure, and motivational and emotional factors. They reported as facilitators to CME delivered through a DBCI the convenience of the delivery method, the practical and pragmatic characteristics of the content, the liaison with specialists, and the possibility for CME to be mandatory.

Conclusions: The perceptions of the barriers and facilitators reported by GPs represent an important contribution to improving knowledge regarding the factors influencing the implementation of CME in primary health care settings. We consider that our study might bring useful insights to other countries where primary health care plays a central role in the provision of care.

Key words

General Practitioners; Primary health care; Continuing medical education; Barriers; Facilitators; Mixed methodology.

Background

Continuing medical education (CME), defined as any and all ways through which doctors learn after the formal completion of their training (1), is a systematic attempt to facilitate change in physicians' practices (2). Efforts have been made to promote physicians' participation in CME, assuming that if they are up-to-date, they will change and improve their practice, resulting in better performance and ultimately better patient care. A meta-

analysis aimed at determining the effect size of CME interventions on physician knowledge, physician performance and patients' outcomes found that the largest effect sizes were found with multifaceted educational programs, longitudinal workshops, interactive small groups, and case discussion interventions, delivered to single discipline participant types (3). However, studies continue to demonstrate considerable gaps between the real and ideal performance and patient outcomes (4). This gap between the real and ideal performance in the health care system increases uncertainty about the role of CME, particularly in terms of changing behaviours associated with everyday clinical practice such as prescribing. Given this gap, there might be a need to better acknowledge the facilitators and barriers to the implementation process of CME interventions.

In recent years, there has been an exponential growth in the potential of e-health CME interventions. E-learning approaches have shown similar effects on outcomes as conventional face-to-face approaches, for instance in terms of learners' knowledge and learner satisfaction (5,6). There are some benefits to an e-learning approach to educational materials: educational content can be easily updated, it can be provided to meet individual learning needs, and can be delivered at any time and in any place, depending on the technology used (5,7). An increasing number and variety of CME e-learning opportunities are now available for primary healthcare, considering that in this setting interventions with a lower demand on professional time and limited budget are particularly interesting.

Digital Behaviour Change Interventions (DBCIs) are behaviour change interventions that involve computer technology or digital encoding of information (8). This specific type of behaviour change intervention has a particular potential for its successful application to CME interventions in primary health care settings, given its low unit-cost, high reach, and its effective and acceptable ways of benefitting individuals and society. Compared with human-delivered interventions, DBCIs usually deliver the intervention content with a high degree of fidelity. They may improve health by improving health professional adherence to evidence-based guidelines and enhancing health professional effectiveness or efficiency (8).

In Portugal, GPs have a four-year mandatory residency training period. During this time, knowledge acquisition in different specialized areas, such as cardiology, paediatrics or psychiatry occur in hospital settings for a few months. After completing their residency, and when choosing to join primary health care units integrated in the Portuguese National Health Service (NHS), GPs are granted with 15 days a year to engage in voluntary CME training, such as conferences and symposiums. Moreover, in most units there is a voluntary and non-

accredited training program, with weekly to monthly presentation and discussion sessions, that are either held as traditional discussion meetings or involve invited participating specialists. There is no need for recertification after residency completion, hence compliance with CME is affected by personal, motivational and organizational factors.

Our work is framed in a larger effectiveness-implementation hybrid type 1 study, where a DBCI called ePrimaPrescribe was developed and implemented, with the aim of changing benzodiazepines (BZD) prescribing patterns and, in a broader sense, the management of mental health issues in a primary health care setting. The objective of the analysis presented in this paper was to explore the perception over the factors that affected GPs' voluntary compliance with our CME digital platform in primary health care settings. Identification of the barriers and facilitators to CME compliance is important for CME providers, GP colleges, and, in a wider sense, for the organization of primary health care services. Hence, with this work we hope to contribute to shaping of CME, adapted to the characteristics and challenges of real-world routine clinical practice in primary health care settings.

Methods

Design and setting

Our study used a mixed-methods sequential design to obtain rich knowledge on GPs' perspectives on the facilitators and barriers to implementing a Digital Behaviour Change Intervention (DBCI) applied to CME. The primary intention of this design was to add a qualitative strand to in-depth initial quantitative results (9).

The quantitative approach allowed us to obtain measurable evidence on providers' perspectives, while the qualitative approach provided a deeper understanding of their perceptions.

We started by collecting data concerning the barriers and facilitators to implementing a DBCI using two questionnaires. The questionnaires allowed us to explore some of the practices, perspectives and points of view of a large number of individuals, though the depth of the research was limited by the standardized approach, which failed to account for the contextual and procedural circumstances and dynamics. This resulted in a lack of sensitivity to explore the differences, inconsistencies, meanings and arguments that emerged (10). In order to

empirically capture the current trajectories and perceptions of the implementation of a DBCI applied to CME in the primary health care settings, it was necessary to apply qualitative methods of data collection. Through semi-structured interviews, the analytical focus centred on lay narratives about GPs' continuing educational experiences using online resources, whose trajectories assume particularities that are not likely to be captured through an overly structured script.

The setting for our intervention were primary health care units in a rural region in Portugal, with an area of 7.393 km², an estimated population of 166.706 inhabitants (2011), a population density of 22.5 inhabitants/km², and approximately 250 GPs working in primary health care units (of which 110 were included in our study). Portugal has an NHS with free coverage for the entire territory. Primary health care is responsible for the provision of care and has a gatekeeping function for hospital care. In Portugal, the NHS distinguishes two types of primary care units. The default one is the 'personalized care unit' model (UCSP), in which professionals receive a fixed salary; the second is the 'family health unit' model (USF), which enjoys higher functional and organizational autonomy (11), and where GPs might have a mixed payment scheme that includes salary, capitation, and pay for performance (12).

Onsite questionnaire and BaFAI questionnaire

Sample and data collection

We distributed, at baseline and at a final implementation onsite visit, a questionnaire containing three multiple answer questions and three short answer questions concerning motivations, expectations and barriers to utilization of our DBCI. At the final implementation onsite visit, which occurred 12 months after intervention implementation, we distributed the Barriers and Facilitators Assessment Instrument (BaFAI) to the participating GPs included in the intervention arm of our effectiveness trial. The BaFAI included a set of 25 issues related to barriers to the implementation of innovations, organized into four categories of barriers: barriers deriving from the characteristics of the practice/innovation; barriers deriving from the characteristics of the professionals; barriers due to patient characteristics; and barriers arising from the intervention context (13). This questionnaire was delivered only to participants who actually used the DBCI online platform. We characterized participant GPs according to their utilization of the DBCI, the type of

primary health care unit where they were prescribing (UCSP vs. USF), their sex, age, years of clinical experience and training in mental health.

Data analysis

We performed descriptive statistical analysis to describe GPs' socio-demographic characteristics, perceived motivations, expectations for using the DBCI, and the main barriers arising from the implementation process into their daily clinical activities.

Semi-structured interviews

Sample and data collection

We conducted semi-structured interviews with GPs included in the intervention arm of our effectiveness study. Questions integrated in the interview's script were based on several sources: on a previous literature review; on the suggestions of the expert who evaluated the intervention before implementation; on information collected from the BaFAI questionnaire; on information from the short-answer questions from the onsite questionnaire; and on topics mentioned in exploratory group discussions held at primary health care units included in the intervention arm of our effectiveness cluster randomized trial. Using a similar language and nomenclature to these instruments, the interviews served to understand the perceptions concerning implementation of our DBCI. The semi-structured in-depth interviews allowed us to reconstruct and deepen procedural aspects, relating them to the experiences and rationalities around the major dimensions of analysis.

One of the main topics of the interview concerned the barriers and facilitators to implementing a DBCI as a delivery method for CME in primary health care settings. Here, a barrier was defined as any factor that was perceived as limiting or restricting GPs' compliance to CME. We focused on barriers that could be changed by an intervention. As a result, we did not consider sex or ethnic background as barriers. Accordingly, we defined facilitator as any factor promoting compliance to CME.

We conducted a pre-test interview in order to: validate the content of the data collection instrument; to check familiar and lexical options; stabilize the categories and identify more problematic, or emerging ambiguous interpretation issues; discover potential errors; and to assess the duration of the interviews.

We defined an initial convenience subject sample for our interview balanced for the same characteristics considered for the onsite questionnaire and BaFAI. These criteria were chosen considering their probable influence on behaviour towards CME.

Data Analysis

Each interview was transcribed and analysed by two researchers and whenever doubts emerged during analysis, a discussion was held until consensus was reached. The qualitative analytical framework used consisted of a content and discourse analysis (14,15) made with the support of the software Atlas.ti (16). The initial categories for the qualitative data analysis were defined based on a preliminary literature review and descriptive analysis of the onsite questionnaire and BaFAI, to which specific categories stemming from the interviews themselves were added. This process was developed in collaboration in order to refine and discuss the kind of categorization created and its conformity with the in loco experience of the empirical research.

Data were converted into segments of relevant information and concepts, then organized into categories, and the results were analysed and interpreted. Quotes were chosen to illustrate the topics, meanings and contexts provided by the interviewees. To maintain participants' confidentiality, the names of the interviewees and of other providers/institutions have been removed from the transcripts. The interviewees are identified in the text by their sex, years of clinical practice, previous training in mental health, and the type of primary health care unit in which they prescribe.

Ethical considerations

Participation was voluntary and informed consent was obtained from all enrolled participants. All information was handled with confidentiality. Each interview was given an anonymized coding number. This study was approved by the Ethics Committees of the Regional Health Administrations of the region where the study was implemented.

Results

Participants

During a twelve-month period, 47 GPs were successfully included in the intervention arm of our cluster-randomized effectiveness study, and had access to our ePrimaPrescribe DBCI platform. We collected data from onsite questionnaires that were completed by 37 intervened GPs. Sixty-eight percent of respondents to this questionnaire had used the DBCI platform and 72% were prescribers at USF primary health care units. The respondents' mean age was 47 years old. The mean years of clinical experience was 20 and 57% of GPs had at least some specific training in mental health (Additional file 1).

The BaFAI was completed by 24 GPs included in the intervention arm, and by 17 GPs included in the control arm of our cluster-randomized effectiveness trial. We found that most respondents were prescribers at USF type primary health care units; that the mean age was 46 years old; the years of clinical experience varied from 4 to 18; and that there was a balanced distribution of responders with and without training in mental health (Additional file 2).

We interviewed 12 GPs who were included in the intervention arm of our effectiveness cluster-randomized trial. Of the total interview participants, 58% were prescribing in USF type primary health care units. Fifty-eight per cent of respondents were male and 58% had effectively used the platform. The mean age was 54 years-old and the mean number of years of clinical practice was 27. Our sample was balanced for previous training in mental health (Additional file 3).

We chose to report the perspectives that were more significant and consistent across the different data sources.

There was a high degree of motivation to participate in the study when it began, which had decreased by the end of the study. The majority of respondents had actively used the DBCI platform, and they considered its implementation feasible, both at the beginning and at the end of the study. At the beginning of the study, the participants considered that the platform would have an impact on changing their BZD prescribing patterns, but the number of GPs reporting this impact significantly decreased by the end of the study (Table 20).

Table 20. Results from the onsite questionnaire multiple answer questions.

	t0 n (relative %)	t12 n (relative %)	Fisher exact test
Q11 – Degree of motivation to participate in this study			
a) None	0 (0)	0 (0)	p=0.614
b) Little	0 (0)	8 (32)	
c) Some	22 (59.46)	14 (56)	
d) A lot	15 (40.54)	3 (12)	
Q16 – Do you think it is feasible to implement online training programs like ePrimaPrescribe?			
a) yes	35 (94.59)	29 (87.88)	p=0.121
b) no	2 (5.41)	4 (12.12)	
Q18 – Do you consider that the use of the ePrimaprescribe platform will have an impact on changing your benzodiazepine prescription pattern?			
a) yes	36 (100)	16 (69.57)	p= 0.138
b) no	0 (0)	7 (30.43)	

When asking about the main motivations and expectations regarding compliance with the implemented DBCI, two themes were mentioned more frequently: knowledge acquisition and practice improvement. Some participants reported that the DBCI made them more aware of the need to make a deep reflection about the consequences of their clinical behaviour, in this case, specifically their prescribing patterns.

Barriers

Time

Both at baseline and at the end of intervention implementation, the lack of time was mentioned as one of the most important factors limiting CME implementation, regardless of it being online or onsite (Table 21). In fact, implementation of the online format was mentioned as being more significantly affected by the time factor, since its utilization had to occur outside of office hours. Despite most GPs having 15 days a year granted for CME, most mentioned that this time was not actually available to be used, due to work overload and the difficulty of rescheduling the excessive number of patients and appointments that would accumulate after a period of absence to comply with CME.

"the excess work we have, I can't afford the luxury of taking off the fifteen days of training we're entitled to a year, isn't it, for, for the free service commission, I can't take them off, because I can't, simply. I don't have anywhere to refer my patients appointments [if I'm on a leave]"

(Interviewee 2, female, 39 years old, 9 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit, used the ePrimaPrescribe DBCI platform)

Work overload, which led GPs to attempt to do many things at the same time because of the limited time they had to fulfil the different tasks they are expected to perform, was referred as anxiogenic. GPs expressing this perception ended up not even trying to use the DBCI, thus demonstrating how the lack of time and its effect on participants' emotions directly influenced intervention implementation.

Work overload

As a barrier to CME implementation, GPs mentioned feeling overwhelmed by their need to receive training in too many different areas, since they are first in line as primary medical care physicians and patients come with very different complaints. Moreover, they also mentioned the fact that they face excessive bureaucracy in their role, leaving little time for training or further studying. In some ways, the GPs' underlying discourse translates into frustration over the impossibility of "doing it all".

"The fields of Family Medicine are many, many, and, and therefore it is difficult to maintain continuous training in, in cardiology, in diabetes, in child health, in, 'you see, in mental health, in, it's this, that, the other. So I think, hmm, they're a lot, they move in many areas at the same time, don't they?"

(Interviewee 5, male, 67 years old, 40 years of clinical practice, with mental health training, prescribing at an USF primary health care unit, used the ePrimaPrescribe DBCI platform)

Digital competence

Barriers related to skills were also mentioned, such as lack of digital know-how because of age. Senior GPs found digital tools challenging due to a lack of knowledge regarding new technologies and long-term working habits. Younger professionals reported being more prone to using digital tools than senior ones.

“Because I always have to look at a lot of things on the computer, uh, I'm not an individual who has much experience in using computers and it bothers me a bit to be watching, having to look at the screen”

(Interviewee 6, male, 64 years old, 30 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit, used the ePrimaPrescribe DBCI platform)

“I might prefer things online, because I can access it more easily”

(Interviewee 8, male, 31 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit, used the ePrimaPrescribe DBCI platform)

Digital infrastructure

Technical issues, such as bad internet connection and lack of sound devices were mentioned as significantly influencing implementation of our DBCI platform (Table 21). The lack of proper hardware at primary health care units to use digital platforms (proper internet connection, or computers' configuration) was pointed to as an important barrier, even when the GP had a high motivation to comply with CME. This was exemplified by a case where the GP chose to print the content of the DBCI because he could not access the platform during office hours.

“I tried to get into USF X at the time...and I couldn't...and then there was no sound and then I couldn't load...and then it was blocked...and therefore, the accesses I ended up doing were at home... and then when I needed it at the I work, to clarify any doubts... I couldn't use it”

(Interviewee 8, male, 31 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit, used the ePrimaPrescribe DBCI platform)

Motivational and emotional factors

In general GPs reported low motivation to comply with CME, especially after their junior residency period. Senior GPs mentioned that residents (hence younger and during their compulsory residency training period) usually make an effort to comply with training, but felt that they themselves had a lower motivation level to participate, mostly due to habit and the perception of a higher work overload. These were some of the reasons pointed out by GPs to excuse a certain therapeutic inertia, particularly concerning BZD prescription and starting BZD withdrawal schemes.

"I understand that older or less patient colleagues no longer have the...motivation to do this type of training"

(Interviewee 8, male, 31 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit, used the ePrimaPrescribe DBCI platform)

"I don't have much patience anymore because I'm going to retire after year!"

(Interviewee 10, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an USF primary health care unit, did not use the ePrimaPrescribe DBCI platform)

The influential factors regarding motivation ranged from problems with changing old routines (Table 21) and therapeutic inertia, to a lack of self-discipline and laziness. GPs related these factors to their difficulty in setting limits between work and leisure time, once again stressing the issue of time as limiting compliance to CME. Some participants stated that a lack of interest in the specific theme of an offered CME intervention would negatively determine their compliance. The general lack of motivation led to feelings of guilt and overwhelm, with the latter being a frequently mentioned argument for non-compliance with CME.

"Afterwards, at home, few colleagues have the will or patience to go open another platform and see something else... they were and are too fed up with work to go do or think about work when they get home"

(Interviewee 8, male, 31 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit, used the ePrimaPrescribe DBCI platform)

"At a certain moment I realized that I was late... and, and that also made me feel a little guilty... deep down I felt that I was failing"

(Interviewee 7, male, 60 years old, 33 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit, did not use the ePrimaPrescribe DBCI platform)

Facilitators

Convenience of delivery method

GPs considered that one of the main facilitators of CME implementation and successful compliance would be the convenience of its delivery method (Table 21). However, when specifying what method would be most convenient, the perspectives seemed antagonistic. Most participants mentioned that they would prefer onsite CME, arguing that they felt that they learned better in such a setting, since it was easier to stay concentrated and avoid distractions.

"The ideal would be things in person, reduced audience, and maybe with a little more frequency. That is, I don't know, every three months, every two months, talk about it...or remember, or give... training, or even if it was just once or twice a year, but with tools that you could use. I think it would be, it would be what would work out better"

(Interviewee 8, male, 31 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit, used the ePrimaPrescribe DBCI platform)

It was also said that onsite training, such as conferences or periodic meetings with experts, allowed GPs to escape their routine, and made it easier to establish limits between work and off-work time. Junior and senior GPs shared the preference for onsite training, although the reasons presented for this preference were different. Senior doctors mentioned preferring onsite training due to technical difficulties and personal preference; junior doctors seemed to prefer onsite training as a way of assuring the protection of their time to comply with CME.

"For me, it would always be more advantageous one, one, one training, even if it was one day a week... or two days a week that I could manage... and at that time I'm just for this... for me it's more profitable than, trying to read, because, and we would be talking to each other..."

(Interviewee 7, male, 60 years old, 33 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit, did not use the ePrimaPrescribe DBCI platform)

For senior GPs onsite CME was also preferred to online due to their lack of openness to digital tools.

"I prefer one with, training with the person present...no, things on the internet, no, don't invite me

(Interviewee 10, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an USF primary health care unit, did not use the ePrimaPrescribe DBCI platform)

Some GPs claimed advantages of an online delivery method, arguing for the feasibility of implementing CME online platforms implementation, for the ease of access to knowledge and the ease of access concerning technical aspects, such as the possibility of using it at any time according to personal availability. For these GPs, CME available online is more convenient, avoids unnecessary travel, responds to the need to be updated, and is an accessible way to improve one's knowledge and practice. The only downside they acknowledged relating to this delivery method was, once again, to time management, since most GPs claimed they were not supposed to use their 15 days' leave a year on this type of CME. Notwithstanding, even for GPs advocating for online CME options, it was recognized it was helpful to have an onsite presentation of digital platforms.

"It's a good option, especially for these issues of time and travel. It can even be done anywhere, anywhere..."

(Interviewee 11, male, 30 years old, 6 years of clinical practice, with mental health training, prescribing at an USF primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

Practical and pragmatic content

Participant GPs suggested specific content characteristics to facilitate CME implementation. Most highlighted the specificity and didactic benefits (Table 21), such as focusing on prescribing and deprescribing processes and on specific pathologies. Regarding online CME, they focused on the need for a nice interface and a simple structure.

"I think it would have to be more, uh, more practical, let's say, it would have to be a more practical training. I'm not saying that no to the issue of pharmacology and all of this, but, uh, [it should] be a thing, uh, eminently practical, with, comprehensive in relation to the various types of treatments that exist, therapies that exist, but it would be more, more practical"

(Interviewee 4, male, 63 years old, 37 years of clinical practice, without mental health training, prescribing at an UCSP primary health care unit, used the ePrimaPrescribe DBCI platform)

Liaison with specialists

Many GPs mentioned that periodic meetings with experts at the primary health care units, and in general communication with practitioners with expertise, would facilitate CME implementation. They perceived this articulation as a way of complementing and accommodating new knowledge and suggested as a practical solution the implementation of a telephone line for questions and answers.

"Even sometimes, I don't know, with the patient present and we call: "look, help me here with this issue, I have this patient, like, how am I going to medicate? What am I going to do to you? She's not better, with the medication she's taking, what can she change?" Something like that"

(Interviewee 10, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an USF primary health care unit, did not use the ePrimaPrescribe DBCI platform)

Mandatory CME

As mentioned above, time was repeatedly mentioned as negatively influencing CME implementation, either through motivation or the perception of work overload. Mandatory CME was perceived by some as a facilitator to implementation and the most adequate solution to this time limitation as a transversal barrier to CME. GPs suggested that mandatory CME would secure days of training, and hence protect time for knowledge acquisition from other pressing clinical duties. It was mentioned that having protected time for CME would make GPs more compliant, regardless of the delivery method (i.e. either online or onsite CME).

"Theoretically there should be a part of our working time to, for personal training, hmm, to read articles, including distance training, which nowadays is often more practical, hmm, and more economical, hmm, in practice. Speaking for myself, I spend, um, ninety-nine percent of my professional time seeing patients"

(Interviewee 7, male, 60 years old, 33 years of clinical practice, with mental health training, prescribing at an UCSP primary health care unit type, did not use the ePrimaPrescribe DBCI platform)

"I don't know, if this comment fits here. I think that, in our training, over the years, maybe there should be mandatory training, right? ...if we were somehow obligated, in quotes, I don't mean doing training all the time, but if there were some things that were mandatory, I'm sure people would go there, would do it, whether through... of platforms, whether it was otherwise, isn't it?"

(Interviewee 3, female, 64 years old, 38 years of clinical practice, without mental health training, prescribing at an USF primary health care unit, used the ePrimaPrescribe DBCI platform)

Taking into account all the factors mentioned in the examples above, the barriers to CME identified by GPs are manifold, and reveal the entanglement of organizational and personal, or more subjective, factors in the perception of GPs about CME in its different possible modalities. The Table 21 below synthesizes these results, of the BaFAI questionnaire, and the globality of factors considered by GPs as barriers to CME:

Table 21. Results of the BaFAI.

Factors identified as barriers	Intervention (n=24) (% of total)	Control (n=17) (% of total)
Characteristics of the practice/innovation		
The online platform leaves enough room for me to make my own conclusions – compatibility	1 (4)	1 (6)
The online platform leaves enough room to consider my patients related mental health needs – specificity	0 (0)	0 (0)
The online platform is a good starting point for my self- study. – didactic flexibility/benefit	0 (0)	1 (6)
Working according to the online platform is too time consuming. – time investment	13(54)	10 (59)
The online platform does not fit into my ways of working at my practice. – attractiveness	7 (29)	6 (35)
The lay-out of this online platform makes it handy for use – attractiveness	2 (8)	4 (23.5)
Barriers deriving from the characteristics of the professionals		
I did not thoroughly use nor remember the online platform – training attitude	10 (42)	10 (59)
I wish to know more about the online platform before I decide to apply it – innovation doubts	8 (33)	10 (59)
I have problems changing my old routines. motivation and role	10 (42)	10 (59)
I think parts of the online platform are incorrect perception knowledge	0 (0)	0 (0)
I have a general resistance to working according to protocols participation	3 (12.5)	3 (18)
Fellow doctors (general practitioners) do not cooperate in applying the online platform – Involvement	3 (12.5)	7 (41)
Other doctors or assistants do not cooperate in applying the online platform – involvement	2 (8)	4 (23.5)
Primary health care coordinators do not cooperate in applying the online platform involvement	3 (12.5)	4 (23.5)
It is difficult to apply the ePrimaPrescribe platform ... because I am not trained to use online platforms workstyle	2 (8)	2 (12)
Barriers due to patient characteristics		
Patients do not cooperate in applying the online platform readiness to change	8 (8)	3 (18)
It is difficult to apply the ePrimaPrescribe platform to patients due to ethnicity characteristics	4 (17)	4 (23.5)
It is difficult to apply the ePrimaPrescribe platform to patients of low socio-economic background Financial situation	5 (21)	2 (12)

Factors identified as barriers	Intervention (n=24) (% of total)	Control (n=17) (% of total)
It is difficult to apply the ePrimaPrescribe platform to older patients (>65 year old) age	6 (25)	3 (18)
It is difficult to apply the ePrimaPrescribe platform to patients that rarely come to the primary health care unit – number of patient contacts	15 (62.5)	6 (35)
Barriers arising from the intervention context		
Working according to this online platform requires financial compensation	1 (4)	1 (6)
It is difficult to apply the ePrimaPrescribe platform if there is not enough supportive staff support staff	3 (12.5)	4 (23.5)
It is difficult to apply the ePrimaPrescribe platform if instruments needed are not available equipment suitable practice	17 (71)	13 (76)
It is difficult to apply the ePrimaPrescribe platform if physical spaces are missing (eg consultation office with computer) – location of facilities	16 (67)	9 (53)
It is difficult to apply the ePrimaPrescribe platform if physical space is lacking (e.g. consulting room) – location of facilities	7 (29)	9 (53)

χ^2 Pearson=162.15; Pr=0.130; Fisher's exact=0.012.

Discussion

The primary context framing our narratives were GPs' perspectives on the implementation process of a DBCI, after being involved in an effectiveness cluster-randomized trial aiming to change their prescription patterns. The reported content, derived from two different questionnaires and in-depth interviews, was enlarged to discussing CME in the primary health care settings and the possibility of delivering CME through online platforms such as our DBCI.

Impact, effect size and motivation to participate

When questioned about their motivations to use and expectations coming from using our DBCI platform, or more generally towards CME compliance, knowledge acquisition and practice improvement were frequently mentioned. Research by Kelly reports similar findings regarding motivation, stating that doctors felt that gaining knowledge was a good reason to comply with CME (17). A meta-analysis regarding CME effectiveness also suggests that the effect size of CME on physician knowledge is medium, though the effect size is small for

physician performance and patient outcomes (3). Thus, there seems to exist a discrepancy between the expected and the real impact of CME implementation. This is in agreement with our effectiveness trial, since after intervention implementation we could not find any significant change in prescription patterns. The reasons for this might be related to a CME being a life-long process, with behaviour change being an incremental, evolutionary process, with reinforcement of knowledge from different sources, and where single events are rarely perceived to effect change (18).

Barriers

Time was consistently pointed out, both by the interviewed GPs in this study and by a large body of literature, as the main barrier to CME implementation (18–23). Time has been reported to transversally affect CME implementation, negatively influencing GPs motivation, satisfaction, and availability, and even their self-perceived role, leading to frustration and guilt (24), and regardless of age or clinical experience. Time management was considered to be even more challenging with online CME, since participants mentioned only being able to take part in this type of intervention in their free time. In some ways, time appears to be a quick and easy justification, pointing to the need for a profound reflection on the possible ways to change this challenging aspect of primary health care settings to allow for the integration of regular and effective CME.

GPs feel, in general, that their training is overall insufficient to handle the variety of clinical situations they have to solve, given that they are in the first line of medical care. Consequently, that they acknowledge that they need to receive continuous training in many different areas. This perception, when confronted with the lack of time, leads again to negative feelings of a lack of discipline, laziness, and of guilt, as well as saturation with work. Indeed, the assumptions that GPs have a manageable workload appears questionable at a time when there is a worldwide strategic shift of responsibility for health onto primary care (25).

GPs often mentioned emotional barriers limiting CME implementation, relating to their perceptions of work and bureaucracy overload, saturation from daily work, and guilt. This points to a general underlying negative perspective and sense of low satisfaction towards their daily clinical role and performance. We might consider this as inevitably jeopardizing any motivation to attend CME, regardless of the type and content of the training. A recent study discussed GPs' wellbeing as an important factor regarding quality of care, GP

prescribing patterns, patients' adherence to medical treatments and patient satisfaction (26). Other evidence discusses reasons for a general feeling of unhappiness and dissatisfaction, reporting that when doctors gather, their conversation turns to misery and talk of early retirement. This suggests that the cause for this dissatisfaction, which in some ways is also found in our data, might be a breakdown in the implicit compact between doctors and society: the individual orientation that doctors are trained for does not fit with the demands of current healthcare systems (27,28).

Older age and greater clinical experience were frequently cited as having a negative influence on GPs' availability for training, suggesting that the opposite - younger age and lower number of years of clinical experience - would be associated with higher levels of motivation to attend CME. However, this might be only true for GPs during their residency/formal training period, since the narratives of young GPs revealed a similar discourse as the ones of senior doctors, pointing to time limitations as a significant barrier to CME. The existing literature regarding age and clinical experience is in accordance with our findings, pointing to other factors, such as time and perception of work overload, as more significantly and transversally influencing doctors' compliance with CME (21).

Lack of digital savvy and lack of proper hardware at primary health care units were also mentioned as important barriers to the implementation and acceptance of online CME, especially for senior GPs. This finding is supported by further evidence, reporting that senior GPs with more years in clinical practice are less likely to have access to or to use computer-based technologies (22,29). However, this might be a changing reality. The current global COVID-19 pandemic situation has, for example, forced many senior doctors who previously refused, due to habit or inertia, to use new technology to adapt and integrate online communication in their clinical practice. Indeed, the idea of the need for a "forced or mandatory" change, taking place within working hours, as a rapid way to lead to desired/effective outcomes was reflected both in our participants' perceptions and in the literature (30,31). Participants reported that acceptance of online training would improve if preceded and periodically accompanied by onsite training, onsite practical discussions with specialists or, at least, an initial onsite presentation of online materials.

Facilitators

Considering the convenience of the CME delivery method regarding to acceptability, and the opposing perspectives regarding onsite versus online preferences, the literature indicates a general preference for live training due to the value of personal interaction and the perception that CME that does not involve personal interaction was adjunctive (19,23,29). However, it has to be recognized that onsite CME may, in many cases, represent a cost-ineffective option, due to the also very limited, availability of specialists. This is a rather interesting future research subject to be pursued after the COVID-19 pandemic, since it the pandemic has been a period where an exponential increase in the use of new technologies to support clinical practice took place.

Having easy access to some kind of interaction with specialists allows for clarification, the personalization of information, exploration, feedback, and reflection. It can also address other needs of doctors that may not be recognized or quantified, such as the need for support, recognition, motivation and fulfilment, and the ‘need’ to belong to a professional community. Thus, it would also be interesting to explore in future research the suggestion of complementing innovative CME delivery methods with a facilitated way of liaising with specialists, such as the implementation of a telephone helpline, as a way of guaranteeing a middle-ground option between onsite and online CME.

Another key solution pointed out by participants was for CME to be mandatory. In fact, “forcing the change” is a significant aspect of our narratives, translated by a common perspective that CME implementation would only be possible through the implementation of obligatory training (30). Participant GPs pointed to this as the only way to protect training time after residency, which is also in accordance with other countries’ experience (31,32). However, there is no clear and compelling body of research that demonstrates that mandatory CME ultimately results in improved GP learning (18). In countries where mandatory CME has been implemented, it has been argued that it devalues and discourages other forms of learning, and that it can detract from a focus on the identification of current or pressing educational needs, the addressing of those needs and the development of reflections about the learning process (18). Notwithstanding, and as another argument for mandatory training, it has to be recognized that CME cannot be entirely focused on GP preferences (23). If implemented in within a reflexive framework, that would allow for participatory decision making about training innovations, novel subjects and formats, mandatory training would push GPs to engage with medical subjects that otherwise they

would otherwise probably neglect, while simultaneously protecting training hours within work schedules.

Conclusion

This study is, to our knowledge, the first to explore the barriers and facilitators perceived by GPs in Portugal to CME implementation. As mentioned, primary health care in Portugal is the main branch of health care responsible for the provision of care and has a gatekeeping function for hospital care. In this sense, the results of this study can be applied to countries where a similar NHS exists, and where primary health care plays a central role in the provision of care.

We consider one of the main strengths of our research to be the choice of a mixed-methods approach, which combined different data sources, allowing for an in-depth acknowledgement of the factors involved in CME implementation. One of the data sources, the BaFAI, also documented that the barriers and facilitators to implementing the DBCI platform used for our effectiveness cluster randomized trial were similar to barriers and facilitators found in our control group, which used a similar methodology and format but a different content. This suggests that, when considering the implementation of a DBCI aimed at changing GPs' behaviour in primary health care settings, our reported barriers - the need for time investment; the general attitudes towards the DBCI; the motivation and self-perceived role of the professionals involved; and the resistance to a change in old practice habits - are worthy of inspection and consideration, regardless of the content of the intervention. The results also show, clearly, that a DBCI would be difficult to implement if adequate instruments and facilities are not available. Furthermore, and in a broader sense, the implementation of CME requires deep reflection integrating bottom-up perspectives, since successful implementation will always significantly depend on perceived challenges coming from daily routine clinical practice.

Declarations

Ethics approval and consent to participate

This research was approved by the Ethics Commission for Health of the Regional Administration of Health for Alentejo Region (Portugal) (02/2016(CES) and the Nova Medical School, Nova University Lisbon, Portugal Ethics Commission (47/2016/CEFCM). The results of this study were disseminated via peer-reviewed publications and conference presentations. All data will be available on request.

Participation was voluntary and informed consent was obtained from all enrolled participants. All information was handled with confidentiality. Each interview was given an anonymized coding number.

Competing interests

The authors declare that they have no competing interests.

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5.3. Manuscript 4: Barriers and facilitators to changing benzodiazepine prescription patterns in Portugal: a mixed-methods study with general practitioners

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Abstract

Background: Benzodiazepines (BZD) are the most used anxiolytic and hypnotic drugs and their over-prescription has long been considered a serious public health problem. General practitioners (GPs) are responsible for the majority of BZD prescriptions and renewals. Several interventions have been implemented to change BZD prescriptions in Portugal and internationally, with limited positive results.

Objectives: To characterise the barriers and facilitators to changing BZD prescription trends, after the implementation of a Digital Behaviour Change Intervention (DBCI) platform, aimed at changing BZD prescribing patterns in a primary health care setting.

Methods: Mixed-methods explanatory sequential design, with quantitative data obtained through the application of an onsite questionnaire and qualitative data obtained through in-depth interviews.

Results: The mixed-methods analysis identified nine main barriers to change BZD prescription patterns: knowledge and training in mental health, time, perceived high frequency of mental health disorders, patients, shared prescription responsibility, social environment, lack of non-pharmaceutical interventions, limited infrastructural resources, GP burnout. Communication and support from psychiatry specialists was the only facilitator that GPs perceived as being a significant factor.

Conclusion: Our findings are in alignment with previous research suggesting that BZD prescribing decisions are complex, uncomfortable, and demanding, particularly when taken within the constraints of daily general practice. They provide insights into mental health management in primary health care, and into the urgent need to address these issues in an integrated manner at a policymaking, social planning and health care infrastructure level.

Keywords

Benzodiazepine's Prescription; Barriers and Facilitators; Primary health care; Mixed-methods; Portugal

Introduction

Benzodiazepines (BZD) are the most used anxiolytic and hypnotic drugs and their over-prescription has long been considered a serious public health problem (1).

In 2015, Portugal was the OECD country with the highest reported consumption of BZDs, with 114 Defined Daily Doses per 1000 inhabitants (DHD) versus 87 DHD in Spain and 16 DHD in the United Kingdom (2). The most recent data published by the Portuguese National Authority of Medicines and Health Products (INFARMED) show that anxiolytics, sedatives and hypnotics were the fourth most used therapeutic drug class in 2019 (3). General Practitioners (GPs) are responsible for the majority of BZD prescriptions, and have a great responsibility for renewing prescriptions coming from other areas of expertise (2,4).

Several interventions of different types have been proposed to change BZD prescription trends (5). Results from these interventions are heterogeneous and are significantly related to factors affecting physicians' decisions to initiate and maintain BZD prescriptions. These include their knowledge, beliefs and attitudes regarding the benefits and risks of BZDs (6,7), but also the context and reality of the country in which the physician is working, and the local organisational and governance characteristics of the primary health care sector (8).

This study aims to characterise the barriers and facilitators to changing BZD prescription trends, after the implementation of a Digital Behaviour Change Intervention (DBCI) (9), aimed at changing BZD prescribing patterns in a primary health care setting.

Our DBCI, ePrimaPrescribe, comprised a platform with three e-learning modules, each of approximately 30 minutes' duration, focusing on: the pharmacological effects and clinical use of BZDs; how to treat anxiety disorder avoiding the continuous use of BZDs; and how to manage BZD dependence and proposals for BZD withdrawal. The setting for our intervention were primary health care units in a rural region in Portugal, with an area of 7,393 km², an estimated population of 166,706 inhabitants, and approximately 250 GPs working in primary health care units. In Portugal, the national health service (NHS) distinguishes two types of primary care unit: the default is the 'personalised care units' model (UCSP), in which professionals receive a fixed salary; the second is the 'family health units' model (USF), which enjoys higher functional and organisational autonomy (10), and where GPs might have a mixed payment scheme that includes salary, capitation and pay for performance (11).

Portugal has a publicly accessible NHS, but despite this, mental health indicators are alarming (12). BZD prescribing in Portugal is very high, and the consumption of these drugs is particularly significant in the region where our intervention was implemented (1).

We hypothesised that after being included in this study, GPs would be able to recognise and reflect on the facilitators and barriers perceived during the study implementation, and that this reflection, together with the use of the ePrimaPrescribe platform, could highlight possibilities to address the determinants of excessive BZD prescription in a more systematic and pragmatic way as a starting point to reverse over-prescription trends.

The findings, but also the DBCI developed in this study about Portugal are likely to have impact in regions with similar problems of over-prescription of BZDs in primary care.

Methods

Study design

We used a mixed-methods explanatory sequential design (13), to obtain an enriched knowledge of GPs' perspectives on the facilitators and barriers to changing BZD prescribing patterns. The primary intention of this design was to use a qualitative strand to add to the initial quantitative results (13).

Selection of study subjects

The DBCI platform, ePrimaPrescribe, was delivered and successfully utilised by 47 GPs. We collected quantitative data from onsite questionnaires that were completed by 37 GPs, at initial the initial moment ($t=0$), and 12 months after study implementation ($t=0$) (Table 22).

We interviewed a purposive sample of 12 GPs, chosen from the total initial participating sample ($n=47$). This sample was balanced by prescribers' sex, type of primary health care unit, and previous training in mental health. The interviews were conducted by telephone, and each had an average length of one hour.

Measurements and qualitative methods

Concerning the onsite questionnaire, we analysed the multiple answer questions using a quantitative descriptive statistical analysis. We analysed the short answer questions using a qualitative thematic analysis, which grounded the questions included in the interview.

Concerning the interviews, after their verbatim transcription, we used a qualitative analytical framework, and we performed a content and discourse analysis (14,15) made with the support of the software Atlas.ti (16). This process was developed by all the researchers involved in the study in order to refine and discuss the categorisations created and their conformity with the *in loco* experience of the empirical research. The categories and processes identified were then further explored according to the specific focus of our work. They are the source of the article's structure where barriers and facilitators to changing BZD prescription were grouped in categories, presented in the next section.

Results

Barriers to changing BZD prescriptions

Knowledge and training in mental health

The majority of the GPs included in our study considered themselves to have a reasonable level of knowledge in terms of managing patients with anxious and depressive symptoms, both at baseline and after intervention implementation (Table 22). However, when asked for their motives for prescribing BZDs, most pointed to clinical diagnoses such as depressive and anxiety disorders. Lack of knowledge was identified as a reason for continued BZD prescription and was also mentioned as contributing to the perceived difficulties in changing excessive prescription trends. Most GPs considered their training in mental health to be insufficient and inadequate, because it mostly took place in a hospital context instead of primary health care settings. This was also perceived as a negative factor influencing their confidence to manage mental health disorders.

Time

Time management was considered a problem and was generally pointed to as one of the main barriers to changing prescription trends. Lack of time was mentioned regarding the duration of consultations, which was considered insufficient, but also in terms of the time GPs had available, in their extra working hours, to keep updated on mental health subjects. Time was not only mentioned as a motivation for prescribing BZDs, but also as a reason for continuing BZD prescriptions, and as a barrier to change prescriptions.

Additionally, some GPs mentioned that it would be too troublesome to cease BZD prescribing due to their own feelings of being overwhelmed and burnt out by the demands of their daily clinical practice. That is, to enrol a patient in a withdrawal process would demand not only for more consultation and study time, but also more mental availability from the part of the GP, which some mentioned not having, mostly because of being overwhelmed with workflow.

Perceived high frequency of mental health disorders

Most respondents to the onsite questionnaire (Table 22) reported prescribing BZDs often or many times. The general perspective was, nevertheless, that too many BZDs were being prescribed. The perceived frequency and characteristics of anxiety and depressive disorders or complaints, the difficulties GPs face in managing mental health in primary health care settings, and the symptom characteristics that first motivated BZD prescriptions were all pointed to both as motives for prescribing, and as reasons for continuing BZD prescription, and were generally felt to be barriers to changing continued prescription. BZDs were often referred to as the only effective and fast acting treatment available for symptomatic relief. Additionally, the drugs' characteristics were recognised as being a barrier to withdrawal, and as creating a vicious cycle between prescription by the doctor and demand from the patient, motivated by tolerance and dependence effects.

Patients

Patients' subjective resistance was globally mentioned as a very strong barrier to changing BZD prescription trends. This resistance was perceived by GPs as being related to patients' emotional connection to BZDs, to the doctor-patient relationship, to patients' demands and expectations of their GP, and patients' lack of understanding of the negative effects of long-term BZD use.

Regarding patients' resistance, it was generally perceived that there was a prevalence of cases of patients feeling vulnerable without the prescription, and even becoming anxious about not having the medicines and starting to have symptoms again.

In addition to such perceived feelings of vulnerability on the part of the patients, GPs considered that withdrawal processes could affect doctor-patient relations if not properly explained, a constraint that depends a lot on the short time available for appointments. For instance, if appointments were longer and a more careful and personalised approach to each patient was feasible, it would be easier to change prescriptions or initiate withdrawal schemes. In the current conjuncture, however, GPs found it difficult.

Another barrier considered by GPs involved the strategies of some patients who find ways to get BZD prescriptions elsewhere. This makes it difficult for GPs to always be attentive enough to their patients so that these kinds of attempts can be well managed. A general feeling of tiredness was also identified as one of the main reasons for GPs being unable to

follow all their patients' cases closely enough to avoid prescribing in the first place, or to initiate consistent withdrawal programs.

Some patients' socio-demographic characteristics were also considered to be a barrier to prescription change. Elderly people and women were mentioned as receiving more prescriptions and as being particularly resistant to prescription change. For the specific case of elderly patients, some GPs mentioned trying to talk patients out of BZDs and negotiating treatment, but that these efforts were often in vain. GPs also mentioned that they did not discontinue BZD prescriptions to older patients because it would be too difficult for them to suffer through withdrawal symptoms.

Shared prescription responsibility

GPs reported feeling their role questioned when the initial BZD prescription was issued by a hospital-based specialist, and also when patients sought BZD prescription renewal with other GPs. Lay sharing of medicines was, to a lesser extent, also considered a barrier, as well as third party requests for prescriptions (whereby a patient asks someone else to get a prescription for BZDs to pass on to them). In the first scenario, GPs mentioned feeling that patients consider another specialist's prescription as having a higher validity, and that this specialist offered a better quality of care; in the second scenario, it made them feel that their efforts to change a prescription were pointless. As a result, GPs mentioned facing the pragmatic barrier that their patients would simply get the BZDs elsewhere if they were to try to engage the patient in a withdrawal scheme.

Social environment

GPs recognised that patients' complaints are frequently associated with social and relational factors but considered that their scope of action was very limited beyond the prescription of drugs. The few GPs who mentioned being concerned with these dimensions referred to some aspects that they considered more common: problems at work or lack of employment, marital problems, loneliness, and addiction. A few participants mentioned that over-prescription was part of a more general society-wide problem of consumerism, linked to people not allowing themselves to grieve or to deal with the source of their mental health problems, and instead looking for a quick fix for their suffering and imbalances.

Lack of non-pharmaceutical interventions

The lack of available community-based programs and local infrastructure to improve mental health, such as physical activity and community activities, and scarce non-pharmaceutical alternatives to deal with anxiety and depression, such as referral to psychological support, were also pointed to as barriers to changing BZD prescription trends.

Limited infrastructural resources

Infrastructural barriers, such as the limited number of rooms available for appointments, a lack of adequate hardware and slowness of the software were also perceived as barriers, since these factors often add stress and delays to GP appointments.

Facilitators to changing BZD prescription patterns

Communication and support from psychiatry specialists

Communication and support from psychiatry specialists was the only facilitator that GPs perceived as being a significant factor that could change BZD prescription trends. However, such support was not generalised, and, in most cases, was based on GPs' personal relations with psychiatrists. Thus, it was not based on any established collaboration procedures or protocol between primary care and mental health departments.

Table 22. Results from the onsite survey multiple answer questions.

	t0 n (relative %)	t12 n (relative %)	Fisher exact test
How would you rate your level of knowledge in managing patients with anxious and depressive symptoms?			
a) Inadequate	3 (9.09)	0 (0)	p=0.251
b) Reasonable	22 (66.67)	24 (68.57)	
c) Good	8 (24.24)	11 (31.43)	
d) Very good	0 (0)	0 (0)	
How would you describe the amount of antidepressants you prescribe?			
a) I never prescribe	0 (0)	0 (0)	p=0.006
b) I prescribe a few times	2 (5.41)	2 (5.41)	
c) I often prescribe	16 (43.24)	18 (48.65)	
d) I prescribe many times	19 (51.35)	17 (45.95)	
How would you describe the amount of BZDs you prescribe?			
a) I never prescribe	1 (2.70)	0 (0)	p=0.364
b) I prescribe a few times	5 (13.51)	9 (24.32)	
c) I often prescribe	22 (59.46)	19 (51.35)	
d) I prescribe many times	9 (24.32)	9 (24.32)	
Do you agree with the indicator established for monitoring the amount of BZDs prescribed to people over 65 years old?			
a) yes	21 (56.76%)	20 (57.14%)	p=0.097
b) no	16 (43.24%)	15 (42.86%)	
Do you think it would make sense to include new indicators for monitoring mental health status in people with anxiety and depression in primary health care?			
a) yes	23 (67.65%)	26 (74.29%)	p=0.01
b) no	11(32.35%)	9 (25.71%)	
Do you think it would make sense to have economic incentives for the adequate follow-up of people with anxiety and depression in primary health care, similar to what happens with diabetes?			
a) yes	18 (51.43%)	26 (76.47%)	p=0.007
b) no	17 (48.57%)	8 (23.53%)	

Discussion

This study is, to our knowledge, the first to explore in depth and using a mixed-methodology, the barriers and facilitators perceived by GPs in Portugal to changing BZD prescription patterns. As mentioned, GPs are responsible for the majority of BZD prescriptions and renewals, and the excessive prescription, despite being a well and long known public health issue, hasn't changed much in the last decades. In **this sense**, the results of this study can be applied to countries with similar concerns over excessive BZD prescription. The main limitation of our research is its limited number of participants, but we consider that limitation was partially overcome by the consistency of our findings with existing literature, and by the depth of our analysis.

Results show that the majority of participating GPs considered that they had a reasonable or good level of knowledge about managing anxiety and depressive symptoms. When asked about their reasons for prescribing BZDs, most participants mentioned inadequate reasons, namely anxiety and depressive disorders, for which the use of BZDs as treatment is, according to prescription guidelines, incorrect (17,18). If on the one hand this reveals an incongruence between GPs' perceived level of knowledge and the treatment they prescribe, on the other hand, participants reported feeling that the few months of mandatory mental health training during residency were insufficient and inadequate - especially considering the context of primary health care practice, which is often described by doctors as overwhelming, due to the need to know how to manage so many different medical areas (19). As previous research suggests, GPs' perceptions of their insufficient training are associated with feeling powerless, making changes in prescription patterns limited (20).

In accordance with literature (6,21), and in addition to being overwhelmed while managing different medical areas, lack of time was also reported as a barrier limiting doctors' availability and capacity to implement alternative interventions rather than prescribing BZDs, in a context perceived by GPs as one of high demand and prevalence of mental health disorders.

While speaking about barriers, GPs mentioned reasons for continuing BZD prescription where more ambiguous issues arose: there was a tendency for GPs to justify such prescriptions, which they recognised as inadequate but necessary, through externalities. The narratives employed included the non-improvement of symptoms, difficulties in managing the symptoms, the characteristics of the disorder, and patients' demands and non-compliance with withdrawal proposals. Additionally, the medicines themselves were also blamed due to

their addictive nature. There was, thus, a detachment on the part of the GPs from what they considered to be problematic prescribing acts, justified through external factors other than their own medical decisions. Similar findings have been reached in other studies, with literature reporting a lack of self-insight into the primary role of GPs in maintaining the vicious cycle of excessive BZD prescribing (6,19,22). This detachment was reproduced when GPs were confronted with questions about the amount of BZDs they prescribed, even though they had the perception, as national data confirms, that it was very high (3). Regarding this aspect, our participants mentioned hospital-based specialists (especially psychiatrists and cardiologists) as being responsible for the majority of initial prescriptions. However, this perspective is not in agreement with the real proportion of prescriptions issued outside primary health care units, which accounts for fewer than 20% of the total prescriptions issued in the public sector (2).

Despite assuming that they had a prominent role in managing common mental health issues, GPs' narratives often attributed responsibility for the initial BZD prescription to other specialists (mainly hospital-based). This is in agreement with a previous 13-year follow-up study, which showed that this was one of three factors associated with long-term BZD use (23). This narrative has also been found in other studies (24), and suggests that GPs might experience difficulties in defining their self-perceived role in managing mental health issues. Prescribing is often seen as a way of mitigating the difficulty of acting when it comes to mental health disorders in primary health care settings (20), hence possibly leading to a particular level of therapeutic inertia.

Patient pressure to continue BZD prescriptions was seen as another reason for long-term prescribing, and GPs said that the majority of patients resisted very strongly to any proposal to change it. This resistance has also been widely reported in the literature addressing GPs' perceptions (6). A study by Linden in 1998 also addressed patients' insistence and BZD cravings (25), providing evidence for drug-seeking or craving behaviour by patients who received low dosage BZD prescriptions, and stating that a major problem with BZD withdrawal could occur even before the proposal of a withdrawal program. However, we should question how this resistance is approached by GPs and institutionally – if it is at all.

In a study by Parr et al., patients reported having the perception that their doctor was unsupportive of BZD withdrawal; for instance, they had not given them sufficient assistance; had continued to write prescriptions; had never questioned whether the BZDs were still needed; had swapped from one BZD to another if there was no significant improvement; or

had not answered the patients' questions (26). There is also evidence showing that GPs have high levels of scepticism regarding non-pharmacological approaches to the treatment of conditions such as anxiety and insomnia (27), that patients have a low level of knowledge regarding the reasons for taking BZDs (28), and that a large proportion of users might never have been adequately informed about the adverse effects of BZDs (29). Studies where a similar initial perception on the part of GPs existed have shown that, when the GPs did in fact propose that patients participate in a withdrawal program, most accepted (30).

Although most doctors point to patients' resistance to change a BZD prescription, evidence shows that most patients who take BZDs for over a year, receive their prescriptions at the reception, and that when patients were interviewed after being adequately informed about BZDs, most of them did not really want to take them (31). Taking this into consideration, one cannot ignore the fact that recognising the importance of stopping BZDs is very different from accepting to initiate a discontinuation process. Furthermore, the other barriers pointed to by GPs, such as the lack of alternative non-pharmacological therapeutic measures (e.g. psychological support or support groups) to help with BZD withdrawal, cannot be ignored.

GPs' perception regarding the fact that the limited number of psychologists available to meet demand constitutes a barrier to changing the management of mental health disorders in primary health care settings is supported by the evidence in the literature (26). However, increasing the availability of psychological support might not be the direct answer to solving excessive BZD prescription. Taking the example of England, access to psychological therapy, through the NHS program "Improving Access to Psychological Therapies", is widely available, either through GP referral or self-referral. However, BZD utilisation in England remains very high and the majority of misuse appears to be with medication that is legitimately prescribed by health professionals (32). This shows, once again, that there are other important factors influencing BZD prescription, which include not only prescription patterns but also the lack of other alternatives to support people dealing how lay people deal with mental health issues. In the current framework psychopharmaceuticalisation is placed as a 'way out' of unpleasant situations or of dealing with mental and physical suffering (33).

Infrastructural barriers were also pointed out by GPs in our study. These included lack of adequate consultation rooms, lack of computers and software limitations, which negatively impacted their general experience of approaching mental health issues during appointments, particularly when attempting to change BZD prescriptions. We could not find any significant

literature specifically mentioning infrastructure as a barrier to changing BZD prescription. This might mean that this issue is specific to the Portuguese reality, or that previous studies did not address the factors influencing BZD prescription with enough coverage so that this theme could emerge.

Communication and support from psychiatry specialists were mentioned as the only perceived facilitators to change BZD prescription patterns. In some cases, it was reported that the existence of continuous articulation with psychiatry specialists was crucial to allow for BZD discontinuation. Articulation between primary health care and psychiatry was considered in the 2017 Portuguese Mental Health Plan to be a key pillar to improve adequate access to care (34). However, this articulation was reported in our data as taking place only occasionally: it was largely based on personal relationships and was associated with a high variability, a fragmentation of care and unequal access to care among different populations. A similar perception of the articulation between primary health care and psychiatry has been previously documented in similar settings, even when the service organisations were very different (20).

We consider that two main dimensions can be further emphasised in the analysis of BZD prescribing as a social phenomenon (35): the first dimension concerns the relevance of the process of the medicalisation of everyday life. This was particularly visible when the participating GPs referred to patients' problems at work, unemployment and marital problems as factors underlying their prescriptions. In addition to more general socio-economic trends, medicalisation also reflects the organisation of primary health care, and the perceptions of its actors – in this case GPs – regarding their role and capabilities in the relief of symptoms of anxiety, adjustment disorders, sleep disturbances and even nervousness. Hypothetically, the prescription of BZDs, wide as it is, may constitute a grey area of diagnostic uncertainty, as suggested by Whyte (36). The second dimension concerns the different therapeutic ideologies that may underlie the barriers to changing prescription patterns for BZDs. It is our hypothesis that, in the act of prescribing, different beliefs may be present regarding both the efficacy of BZDs and other ways of treating psychological distress, which justify the frequent use of BZDs, since in all dimensions of medical action the drugs are likely to be considered the most important therapeutic resource available (36,37). In a context of scarce consultation time, justified by the logic of optimising public health care provision, combined with a shortage of GPs and psychiatrists, due to slow generational renewal and a low number of new hires, and where there is a tendency to over-

pathologise psychological traits, BZD prescriptions may be the most effective strategy that GPs find to cope with the volume of mental health needs they encounter. This strategy, however, involves silencing symptoms early on through medication (35). GPs felt seemingly unable, both due to subjective and structural constraints, to address these issues in a more integrated manner.

Conclusion

Our findings are in alignment with previous research suggesting that BZD prescribing decisions are complex, uncomfortable and demanding, particularly when taken within the constraints of daily general practice. They provide insights into mental health management in primary health care, into phenomena of psychopharmaceuticalisation, and into the urgent need to address these issues in an integrated manner at a policymaking, social planning and health care infrastructure level. The findings in our study can inform action in these spheres regarding primary health care provision, crucial in managing mental and physical well-being.

Ethics approval and consent to participate

This research was approved by the Ethics Commission for Health of the Regional Administration of Health for Alentejo Region (Portugal) (02/2016(CES) and the Nova Medical School, Nova University Lisbon, Portugal Ethics Commission (47/2016/CEFCM).

Participation was voluntary and informed consent was obtained from all enrolled participants. All information was handled with confidentiality. Each interview was given an anonymized coding number.

Clinical Trials Registry

The study is registered at ClinicalTrials.gov, with the number NCT04925596.

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**General Practitioners' perspectives over
solutions to change BZD prescription trends**

6. General Practitioners' perspectives over solutions to change BZD prescription trends

As shown in our literature review, changing perspectives and attitudes in clinical practice is a complex process requiring the conjugation of measures to implement facilitating factors and overcome barriers.

There is a gap in the literature addressing systematically solutions to overcome factors negatively influencing changing of BZD prescription pattern, among which ensuring close engagement of GPs.

In this sense, we propose in our work an exploratory analysis of GPs' solutions to improve BZD prescription and, more broadly, to manage anxiety and depression in primary health care settings.

6.1. Manuscript 5: General Practitioners' perspectives over solutions to change BZD prescription trends – a qualitative study in Portugal

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Abstract

Background: This qualitative study explores General Practitioners' (GPs) perspectives on solutions to address the problem of excessive prescription of benzodiazepines (BZDs). Over-prescription of BZDs at primary health care settings is a prevalent issue in Portugal, but also elsewhere internationally. GPs are the gatekeepers to these medicines in primary care, but for several subjective, organizational and external reasons, they find it difficult to change current prescription patterns.

Methods: Qualitative data were collected in seven primary health care centers in a region of Portugal. We conducted 12 semi-structured interviews with GPs. Interviews were audio-recorded, transcribed verbatim and underwent thematic analysis. The themes were integrated and organized into eight axes for action.

Results: Solutions proposed by GPs focused on organizational aspects, such as human resources, infrastructure and training (including on withdrawal schemes), alternative non-pharmacological approaches, and wider community-based initiatives to counter societal aspects affecting mental health in the identified region.

Conclusions: The findings provide an assessment of the priorities to change excessive BZDs prescription, as suggested by the GPs in primary health care settings, and hence reflects what they consider to be context specific needs. Both experts' and multi-stakeholders' bottom-up perspectives should be taken into account when proposing new policies and local strategies to tackle current excessive BZD prescription, especially considering the failure of previous strategies to change this well-known public health issue. We consider that our results are generalizable to all countries where primary health care plays a central role in care provision.

Key words

General Practitioners; Primary health care; Prescription; Benzodiazepines; Qualitative research; Solutions.

Background

During the 1960s and 1970s, after the introduction of the first antidepressants and benzodiazepines (BZDs) on the market, there was a growing feeling in medical spheres that prescribing such kind of medications was a safe, justifiable and effective way to help patients to cope with the stresses and strains of everyday life. Thus, the medical profession found itself providing a pharmacological response to psychological problems, a situation with profound implications for society as a whole (1). These early practices paved the way for a certain structural, political, as well as public health disregard for what are the social determinants of mental health (2–4). This, together with wider organizational issues regarding mental health care provision, and a lack of human resources in primary health care units has given rise to what has been called the “psychopharmaceuticalization of human suffering” (5).

In this context, the prescription of BZDs, among other kinds of psychopharmaceuticalization and polypharmacy, grew dramatically (6). Despite early beliefs about BZDs being a panacea for mental health issues related to anxiety and depression, their continuous utilization is today recognized as being strongly associated with several serious side effects and dependence issues (7).

BZDs are globally one of the most prescribed psychotropic drugs. They are not only prescribed by psychiatrists, but also, and mostly, by General Practitioners (GPs). In fact, GPs are responsible for the majority of BZDs prescriptions, which has become a pressing issue in the management of long-term BZDs intake, both in the context of the research underlying this article – conducted in Portugal - but also elsewhere (8–10). Previous research has shown that BZD prescription by GPs is an ambivalent process (11). Despite often referring to the act of prescribing as part of their quest for patients’ well-being, GPs are in an ambiguous position between prescribing restrictions coming from both society and health authorities (12,13), and their own subjective doubts and concerns regarding the initiation of BZDs withdrawal processes (14).

Interventions to change BZDs prescription patterns have been repeatedly implemented. These include minimal educational interventions (15–17), systematic discontinuation interventions (18,19), audit and feedback interventions (20), and policy interventions (21,22). The results are variable, inconsistent and, when positive, the effect is frequently lost after a short period of time.

Studies have tried to explore the experiences, attitudes and perceptions of GP’s regarding BZDs prescribing patterns (7,11,23), but there is still a gap in the research concerning an in-depth analysis of what GPs are available to do, and find necessary, to change the behavioral complexity of BZD prescription. This article explores solutions suggested by GPs to reduce BZDs prescription, upon

using (or failing to use) a Digital Behavior Change Intervention (DBCI), called ePrimaPrescribe, focused on BZD prescription and withdrawal strategies. These solutions point to the importance of structural, organizational and therapeutic and societal measures and will be explored below. We argue that bottom-up perspectives should be considered when creating innovative proposals to solve excessive BZD prescribing patterns within and beyond clinical practice, particularly considering the failure of previous strategies to change this well-known public health issue.

Research Design and Methods

Research design and sampling

We conducted semi-structured interviews with an initial convenience subject sample of GPs, coming from the intervention arm of a hybrid type 1 study cluster-randomized study, with the aim of evaluating the effectiveness and implementation process of a DBCI – called ePrimaPrescribe – to change BZD prescription trends. This method was chosen due to the flexibility and depth it offers in exploring individuals' experiences, perspectives and discourses on particular matters (24), and due to the potential for articulation with further data, gathered in existing research on the same subject and in the quantitative arm of this study. We asked GPs to focus on solutions they considered pertinent and feasible for implementation in their daily clinical practice to facilitate change in BZDs prescription trends, and improve the management of patients with anxiety and depression (to which these medicines are often prescribed) in primary health care settings.

In Portugal, the national health service (NHS) distinguishes two types of primary health care unit: the default is the 'personalized care units' model (UCSP), in which professionals receive a fixed salary; the second is the 'family health units' model (USF), in which health professionals have higher functional and organizational autonomy and where they might have a mixed payment scheme that includes salary, capitation and payment for performance (25,26). Primary health care unit's characteristics were considered in the sample selection considering that it might influence GPs' perspectives over organizational aspects of the proposed solutions.

We carried out 12 interviews. The socio-demographic characteristics of the GPs included in our sample are detailed in Table 23. The interviews were made by the first author, in person at clinical settings and by phone (to comply with Covid-19 restrictions).

Table 23. GPs sociodemographic characteristics.

Characteristics of primary health care doctors	n (% do total)
Type of primary health care unit	
USF	7 (58)
UCSP	5 (42)
Specific training in mental health	
Yes	6 (50)
No	6 (50)
Gender	
Female	5 (42)
Male	7 (58)
Usage of ePrimaPrescribe	
Yes	7 (58)
No	5 (42)
Age	
mean	54.25
SD	14.88
(min, max)	(30, 67)
Years of clinical practice	
mean	26.8
SD	14.56
(min, max)	(5, 40)

Ethical considerations and informed consent

Participants were informed about the purpose of the study, that participation was voluntary and that they could withdraw at any time for any reason. It was explained that the data would be anonymized and that the participants could request to have any of their statements deleted from the record. All participants who were approached confirmed their willingness to participate and consented to the interviews being audio recorded. When transcribing the interviews, all names of persons, services, cities and municipalities were exchanged with anonymized identifiers.

Data analysis

Interviews were transcribed verbatim, read, and analyzed. They were coded, synthesized and categorized according to similarities of meaning (27,28). Patterns within and across categories were

analyzed and grouped into themes. Categories and themes were driven by literature concerning the problematic of excessive BZDs prescription, on interventions to change prescription patterns, and on barriers and facilitators to such changes. Coding continued until no new concepts emerged from the data. Coding, category-building procedures and thematic analysis were discussed by the authors until consensus was reached. Data analysis was supported by ATLAS.ti (29). Participants' quotes were translated from Portuguese to English and cross-checked for accuracy.

Results

As presented in Table 24 below, the solutions suggested by GPs pertain to wider issues: human resources, training in mental health, communication with psychiatry, time management, performance indicators, collaborative and community-based initiatives and psychotherapy as non-pharmacologic alternative to BZD prescription.

Table 24. Description of themes for suggested solutions.

Theme	Description
Human Resources	Hiring GPs, task shifting, psychologists
Psychotherapy	Psychotherapeutic approach to mental health issues
Training in mental health	Integrated approach in training
Communication with psychiatry	Communication and articulation with mental health specialists
Time management	Time management during consultation
Prioritization of mental health in GP appointments	Creation of specific resources to manage mental illness in primary health care settings
Implementation of performance indicators	Implementation of payment for performance to incentive the management of mental illness in primary health care settings
Collaborative or community-based initiatives	Public campaigns in the media, more community-based activities, more local infrastructure

Human Resources

The solutions mentioned by GPs regarding human resources emphasized the need for more health staff, namely more GPs and nurses. Participants' perspectives concurred when referring to how this would indirectly lead to a change in the current BZD prescribing patterns, since prescribing was often seen as the only resource available to assist patients with psychological suffering.

GPs mentioned that the involvement of nurses and task shifting with this group of professionals would probably be a facilitating factor, but anticipated difficulties justified by their belief on nurses' lack of interest to be involved in the multidisciplinary management of mentally ill patients.

Additionally, all participants mentioned the need for more psychologists working in primary health care settings, in articulation with GPs. Some of the respondents' opinions were critical about the lack of communication between GPs and psychologists, and they complained that they referred patients to psychologists who were not accepted because of a lack of human resource capacity to enroll more patients in therapy.

Training in mental health

GPs stated recurrently that they needed more training and continuous support to feel confident and able to effectively intervene in mental health, particularly to become more secure to refuse BZD prescription and propose an alternative non-pharmacological treatment.

Regarding the organizational aspects of continuous training implementation to improve the quality of mental health care, GPs suggested, almost unanimously, the need for this to be compulsory and integrated into clinical time (versus voluntary and taking place on their free time). A significant number also referred to the need for this training to be regular, managed by a specialized mental health professional, and focused on practical situations of daily clinical practice. This training would preferably take place in person, but GPs acknowledged the possibility of online training if introduced, or supported, by occasional in-person contact with a specialist.

Communication with psychiatry

GPs stated that communication with a psychiatry specialist would allow them to solve situations in the primary health care units, since it would clarify their questions and help them with more complex clinical cases. One participant stated that such regular communication would work as continuous medical training. To improve communication with specialists, GPs suggested the creation of a telephone help line or very short regular meetings specifically to share experiences and discuss clinical cases.

Time management

The issue of time management was raised very frequently and by the majority of participants. GPs stated that the current duration scheduled for medical appointments, which is of 20 minutes in Portugal, acted as a direct trigger for BZDs prescription. They suggested that appointments to manage mental health issues should have a longer duration.

Prioritization of mental health in GP appointments

Two participants mentioned the possibility of having a specific time, or specific mental health consultation, such as exists for perinatal and pediatric care. They recognized, however, the importance of creating a non-stigmatizing environment, and hence suggested that this specific consultation period to be managed by each GP individually, instead of being scheduled and organized by the primary health care unit.

Implementation of performance indicators

GPs had ambivalent perspectives regarding performance indicators as organizational incentives to change their BZDs prescribing patterns and to improve the quality of care in general. Although they recognized that implementing performance indicators might have an immediate effect, they disliked them in general, considering that they are easily circumventable and that they do, in some way, distort the ultimate purpose of a medical intervention, which they consider to be the improvement of patients' health.

Collaborative or community-based initiatives

GPs recommend fomenting public awareness about mental health, the perils of BZDs and destigmatizing mental illness, creating socially-adapted consultations for mental health (organized either discreetly by the GP, or by the health unit), the training of health staff to provide support in mental health (task shifting), and more community-based programs and local infrastructure that would enable the pursuit of therapeutic non-pharmacologic alternatives (exercise, occupational activities, etc.).

Regarding specific solutions or interventions, two participants stated that their perspective on awareness campaigns, using, for example, the distribution of leaflets in waiting rooms, would fail to have any significant impact.

Psychotherapy

GPs mentioned psychotherapy as the alternative, and preferable, therapy to medications such as BZDs.

GPs were unanimous when referring to the crucial need to integrate a greater number of psychologists into primary health care units to allow them to choose other treatment options over prescribing BZDs. Although the need for articulated care was also mentioned, GPs seemed to recognize the value of implementing specific multidisciplinary community mental health teams, integrating GPs, nurses and psychologists.

Discussion

The present study provides an overview of solutions suggested by GPs to bring about a change in BZD prescribing patterns. Identification of the most prominent needs and priorities for prescribers was grounded in perceptions adapted to daily practice in primary health care settings.

The focus of the GP's discourses reflects ambiguities, but also general patterns regarding the identification of barriers and facilitators that are crucial for a comprehensive understanding of what is at stake in medical practice and in GPs' relations with patients and medicines (3,30).

Addressing human resources needs, and specifically the need to hire more GPs, was considered a crucial issue to change BZDs prescribing patterns and improve the quality of mental health care in primary health care settings. In fact, the arguments used by the participant GPs to justify this solution are consistent with other research reporting dissatisfaction among GPs with their large patient loads and perceived work overload (2,8,31).

The issue of human resources was also mentioned in terms of the need for task shifting and the involvement of nurses. GPs anticipated difficulties in the articulation with nurses, however, this perception might be biased, as suggested by existing research, accounting for the willingness of nurses to be more involved despite feeling unappreciated and powerless to change a prescription or contradict the physician (31).

The need for more psychologists was highlighted as a priority to change the management of mental health disorders in primary health care settings. This is in line with the literature (32). However, this might not be a direct solution to excessive BZD prescription patterns. Taking the example of England, the access to psychological therapy services through the NHS program "Improving

Access to Psychological Therapies”, is widely available, either through GP referral or self-referral. However, BZDs utilization in England remains very high and the majority of misuse appears to be with medication legitimately prescribed by health professionals (33), showing, once again, that there are other important factors influencing BZDs prescription.

Regarding training in mental health most studies agree with our data, mentioning that there is a general need for better training of GPs (8). The suggestion of our participant GPs, that there should be regular compulsory training for GPs, as exists in other European countries (34), would probably be a more feasible and cost-effective solution than the implementation of regular meetings between GPs and psychiatry specialists in the short-term.

GPs’ lack of communication with and support from psychiatry specialists is frequently referred to in the literature as an important barrier to changing BZDs prescribing patterns (35). GPs suggested specific ways to implement this solution, such as the creation of a telephone help line for professionals, as opposed to the idea of regular meetings, which would probably be relatively easy and cost-effective to implement.

The issue of time management was frequently mentioned by the GPs in our study as a significant barrier to changing prescribing patterns, and in general to managing of mental health issues in primary health care settings. GPs mentioned the need for more time to dedicate to patients with mental health issues but solving this problem by increasing the duration of consultations would aggravate the lack of human resources. This reinforces the need for investment in mental health, and more specifically in hiring more health workers for primary health care units (2).

GPs had ambivalent perspectives regarding the implementation of indicators associated with payment for performance (P4P). Despite the fact that P4P has demonstrated significant effects, such as improving the attention given to specific therapeutic areas associated with these types of incentives, when doctors are resource-constrained, a redistribution of care between the patients under P4P inevitably arises, which might lead GPs to dedicate more time and care to patients with disorders that more easily reach performance targets (36). Thus, such solutions would have to be carefully implemented to avoid unintended inequalities in patients’ access to healthcare and would have to be closely monitored for the maintenance of ethical standards.

GPs considered that solutions integrated in the community would have a significant impact. In fact, the literature points to the importance of involving different stakeholders to achieve a successful change in prescribing patterns. A recent publication is in agreement with the suggestions of the participants in our study, mentioning that cooperation between all stakeholders involved in

managing mental health disorders (i.e. GPs and nurses) facilitates successful changes in BZDs prescribing patterns (31). In addition, this publication emphasizes that increased communication and shared decision-making between GPs and patients would optimize medication according to patient's preferences.

GPs in our study had some difficulty in mentioning specific community-based solutions, possibly because they had reservations about the impact of such interventions. However, despite most participant GPs questioning the impact of implementing minimal interventions with patients, such as leaflet distribution, this type of intervention has been demonstrated to have a significant impact (37).

Conclusions

Our study responds to a gap in the literature by giving voice to GPs to suggest the solutions to change BZDs prescribing patterns that they consider most feasible and adapted to their clinical daily routines. Despite some of the solutions maybe being considered very specific to the Portuguese primary health care system, the fact that most of the barriers to prescription change that underlie these proposed solutions agree with the literature, points to the possibility of their generalization. Hence, the results of this study can be applied to countries where free coverage NHS similar to the one in Portugal exist, and where primary health care has a central role in the provision of care.

The solutions suggested by the participant GPs emphasize the relevance of taking GPs' perspectives into consideration when aiming to improve the quality of care. However, some of the solutions proposed, such as communication with psychiatry, time management, the prioritization of mental health in GP appointments, and the implementation of performance indicators are mainly organizational would also depend on profound structural (top-down) changes, with simultaneous intervention in areas as diverse as human resource management, collaboration and interdisciplinary training, and would require the commitment of all stakeholders involved in community mental health disease management, namely nurses, GPs, psychologists, psychiatrists and patients. These are warranted issues to be tackled, but, in the meanwhile, some of the suggested solutions might be feasible internally in health units if better communication and time (and bureaucratic) management strategies are designed, including internal strategies for each primary health care setting, or for the small coverage areas of these healthcare units.

We have outlined suggestions from prescribing agents – GPs – that identified first -what they considered to be working measures to decrease BZD prescription. Some of these will need time to be structured into actual changes and improvements in health services, but others can be rapidly implemented, being a good starting point in the inversion of over-prescription and psychopharmaceuticalization trends.

Declarations

Ethics approval and consent to participate

This research was approved by the Ethics Commission for Health of the Regional Administration of Health for Alentejo Region (Portugal) (02/2016(CES) and the Nova Medical School, Nova University Lisbon, Portugal Ethics Commission (47/2016/CEFCM). The results of this study were disseminated via peer-reviewed publications and conference presentations. All data will be available on request.

Participation was voluntary and informed consent was obtained from all enrolled participants. All information was handled with confidentiality. Each interview was given an anonymized coding number.

Conflict of interest

The authors declare that they have no conflict of interest.

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Conclusions

7. Conclusions

The main idea underlying this PhD thesis was a sincere concern with the high number of BZDs prescribed in Portuguese primary health care settings, and the belief that these prescribing patterns might be the tip of the iceberg of a greater subject: the management of mild to moderate mental health complaints, namely anxiety and depression, and of mental health disorders in these settings.

The development of the DBCI ePrimaPrescribe was an interesting and challenging process. It gave us the opportunity to apply a theoretical behaviour change model, the Behaviour Changing Wheel, to a specific subject and with an innovative implementation methodology. The questions that anchored the application of this theoretical model grounded, from the beginning of our work, was the devolvement of the implementation evaluation process. This allowed for early reflections on the need for an intervention to change BZD prescribing patterns, the best way to address this issue in the particular setting of primary health care, the most suitable delivery mode for such an intervention, and the type of data that would be collected. Moreover, the Behaviour Changing Wheel model allowed us to grasp the relevance of devoting time and effort to understanding BZD prescribing behaviour, and the potential of studying it in depth. Only then, and through a clear identification of the most adequate intervention functions, using the best adapted behaviour changing techniques, could we critically design an intervention to change BZD prescribing behaviour. We chose a digital delivery method because, in addition to the fact that it has been demonstrated in the literature to have potential benefits such as practicability, affordability, safety, and equity of access, there was a gap in the knowledge concerning the implementation of such a delivery method in Portuguese primary health care units.

There were significant limitations and difficulties reported in the utilisation of our DBCI at the time of implementation (May 2017), some related to personal preference and perceived digital (in)competence. Since then, the COVID-19 pandemic has forced doctors (including GPs) into the digital era, bringing on a rapid and massive uptake in the utilisation of digital tools to allow the maintenance of clinical care. Thus, we consider that the replication of our mode of delivery, if carried out now, would probably have better acceptability, practicability, and effectiveness.

In chapter 4.1, we presented our research protocol in the form of an article because, as stated above, from the beginning we were concerned with following, and above all learning from, the methodology that we chose to apply. Additionally, we considered an article to be the more legible and clear way of presenting the main thread that connects all of the pieces composing this PhD thesis.

In chapter 4.2., we presented the results of our effectiveness study. Despite knowing from previous studies that it was a possibility that we would find no significant impact of our intervention, the enthusiasm with which the intervention was first received in the primary health care units during the first onsite visit made us believe in the possibility that we could achieve significant positive results. Even a few years after implementation, and despite the fact that the main purpose of our intervention had been unsuccessful – since there had been no change in overall BZD prescribing patterns – we still consider that the methodology chosen has potential and could be generalised to other areas beyond the Alentejo region. However, we recognise that successful implementation would have to take into account the barriers and facilitators exposed by our evaluation of the implementation process.

In fact, the lack of impact of our intervention gave even more sense to the work we developed in chapter 5. Due to the richness and depth of the responses collected during the implementation evaluation process, we chose very consciously to include a section where we could describe, exemplify, and discuss them in detail. We recognise that this section repeats some of the information later presented in sections 5.2 and 5.3. This notwithstanding, we considered it pertinent to combine the information from the different sources, obtained through our mixed methods methodology, since this allowed us in a concrete way to validate and strengthen the value of the complementary perceptions derived from both the quantitative and qualitative data sources. This approach supported our decision to merge GPs' subjective perspectives of their performance regarding BZD prescribing, as well as of continuing medical education. This methodology made us feel more secure in exposing some narratives that might otherwise be interpreted as extreme and unrepresentative of the reality as it was felt by the participant GPs.

During our implementation evaluation process, some topics reappeared numerous times in the different data sources, which, in our interpretation, highlights the importance of their implications for both policy and clinical practice. Time – namely a lack thereof – was mentioned across the board and used to justify both excessive BZD prescribing and the difficulty of complying with continuing medical education. Although it is acknowledged by

the literature and the general sense of health professionals that time limitations do restrict GPs' capacity to carry out certain interventions and address more complex clinical issues, our research shows that lack of time was possibly also used by GPs to justify and make their peace with particular decisions and ways of acting that could, from a detached point of view, be considered to go against prevailing clinical guidelines and best practice.

Considering the type of therapeutic ideologies expressed by the participant GPs, we conclude that medication continues to be the touchstone in the therapeutic management of mental suffering in primary health care settings, and that it is not possible to replace medicines with other non-pharmacological therapies, except in very specific cases. In terms of prescribing practices, BZDs seem to be first in line in a psychopharmaceuticalisation process, since they are the resource mobilised in the first place when a patient expresses a complaint in terms of psychological suffering. The narratives gathered through this research emphasise the need for GPs to hold an external locus responsible for such practices, as if the prescription was in some way detached from the clinical act itself. This was very clear when GPs suggested that it was professionals from other specialties, such as cardiology and psychiatry, who were responsible for initiating a patient's BZD prescription, but also when considering patients to be one of the main barriers to changing or discontinuing a BZD prescription. This perspective appears to be in conflict with the fact that the management of light to moderate mental health issues is primarily undertaken in primary health care settings. It was very interesting to note that, despite the circumscribed nature of our research, not only were the data coming from different sources (the onsite questionnaire and in-depth interviews) largely overlapping and consistent, but that the key findings also agree with Zózimo's research among GPs in another region in Portugal.

In summary, we hope that our work might contribute in three distinct ways to the management of mental health in primary health care settings: first, to allow for a reflection on the type of interventions that could effectively impact the prescribing of BZDs, and in a deeper sense a reflection concerning all of the factors that are involved in and lead to such prescriptions; second, to elaborate on the discussion around the type of continuing medical education that could be acceptably implemented and would lead to satisfactory compliance among GPs; and finally, to acknowledge the importance of involving GPs – and in a broader perspective, health care providers – in suggesting solutions adapted to the reality of their routine clinical settings.

**PRESCRIPTION OF BENZODIAZEPINES BY PRIMARY HEALTH
CARE DOCTORS: CHARACTERISTICS OF PRESCRIBING TREND
AND IMPLEMENTATION OF AN ONLINE PROGRAM**

TERESA ALVES DOS REIS

Additional files

February, 2022

**PRESCRIPTION OF BENZODIAZEPINES BY PRIMARY HEALTH
CARE DOCTORS: CHARACTERISTICS OF PRESCRIBING TREND
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Additional files

Teresa Alves dos Reis

February, 2022

Table of Contents

ADDITIONAL FILE 1. PRIMARY HEALTH CARE UNITS CHARACTERISTICS CONSIDERED TO RANDOMIZATION AND ALLOCATION TO RANDOMIZATION ARM.	2
ADDITIONAL FILE 2. CHARACTERISTICS OF PATIENTS WITH BZD PRESCRIPTION.....	3
ADDITIONAL FILE 3. BZD PRESCRIPTION FREQUENCY BY TYPE OF PRIMARY HEALTH CARE UNIT.	4
ADDITIONAL FILE 4. BZD PRESCRIPTION FREQUENCY BY ACTIVE PHARMACEUTICAL INGREDIENTS.....	5
ADDITIONAL FILE 5. BZD PRESCRIPTION PROPORTION BY ACTIVE PHARMACEUTICAL INGREDIENT TO PATIENTS OVER 65 YEARS OLD.	6
ADDITIONAL FILE 6. BZD PRESCRIPTION PROPORTION BY ACTIVE PHARMACEUTICAL INGREDIENT TO FEMALES.	7
ADDITIONAL FILE 7. PRESCRIPTION FREQUENCY BY BZD HALF-LIFE.....	8
ADDITIONAL FILE 8. DESCRIPTION OF DIAGNOSIS INCLUDED IN SECONDARY OUTCOME ANALYSIS.	9
ADDITIONAL FILE 9. DIAGNOSIS CODED AT THE SAME MONTH AS BZD PRESCRIPTION.	10
ADDITIONAL FILE 10. GRID ANALYSIS OF INITIAL AND FINAL QUESTIONNAIRES – ONSITE SURVEY.....	11
ADDITIONAL FILE 11. CATEGORY CODING FOR ONSITE QUESTIONNAIRE SHORT ANSWER QUESTIONS.....	19
ADDITIONAL FILE 12. GRID ANALYSIS OF IN-DEPTH SEMI-STRUCTURED INTERVIEW.	59
ADDITIONAL FILE 13. CHARACTERISTICS OF ONSITE QUESTIONNAIRE RESPONDERS.....	70
ADDITIONAL FILE 14. CHARACTERISTICS OF BAFAI RESPONDERS.	71
ADDITIONAL FILE 15. CHARACTERISTICS OF INTERVIEW RESPONDERS.	72
ADDITIONAL FILE 16. CHARACTERISTICS OF ONSITE QUESTIONNAIRE RESPONDERS.....	73
ADDITIONAL FILE 17. CHARACTERISTICS OF INTERVIEW RESPONDERS.	74

Additional files

Additional files

This volume contains the additional files to the main content of the PhD thesis entitled PRESCRIPTION OF BENZODIAZEPINES BY PRIMARY HEALTH CARE DOCTORS: CHARACTERISTICS OF PRESCRIBING TREND AND IMPLEMENTATION OF AN ONLINE PROGRAM.

We chose not to include the data presented in these additional files in the main thesis document since they constitute an in-depth analysis or detailed data that otherwise we consider to overload the content reading and interpretation.

The additional files are numbered according to order of appearance in the main text.

Additional file 1. Primary health care units characteristics considered to randomization and allocation to randomization arm.

Primary health care unit	Type	No. doctors	Mean no. appointments /month	Mean no. patients /month	Randomisation arm
UCSP Alandroal	UCSP	3	5392	2302	intervention
USF Matriz	USF	5	6622	2594	control
USF Quinta da Prata	USF	4	8480	2883	control
UCSP Estremoz	UCSP	8	12279	2832	intervention
USF Eborae	USF	8	14743	3980	intervention
USF Planície	USF	8	14097	3724	intervention
USF Salus	USF	8	13915	3485	control
USF Sol	USF	5	8721	2391	control
USF Lusitânia	USF	5	9270	2458	control
UCSP Montemor-o-Novo – USF Floral	USF	5	7302	1934	intervention
USF Alcaides	USF	5	9450	3091	intervention
UCSP Mora	UCSP	4	5019	2578	control
UCSP Portel	UCSP	3	6008	2227	intervention
UCSP Redondo	UCSP	4	6487	3037	intervention
USF Remo	USF	9	13979	4663	control
UCSP Vendas Novas	UCSP	7	11263	2108	control
UCSP Viana do Alentejo	UCSP	4	5568	1839	intervention
UCSP Vila Viçosa	UCSP	4	8097	3322	control

Additional file 2. Characteristics of patients with BZD prescription.

Characteristics	Baseline		6 months after intervention		12 months after intervention	
	Intervention	Control	Intervention	Control	Intervention	Control
Age (years), median	67.3	67.0	67.7	66.6	67.6	67.1
Significance (IC 95%): intervention: $p=0.383$; control: $p=0.269$; between intervention and control: $p=0.159$						
Age (years)	No. of prescriptions by age category					
0-25	42 (0.5%)	51 (0.7%)	44 (0.6%)	48 (0.7%)	35 (0.5%)	69 (1%)
25-44	650 (8%)	580 (8.0%)	505 (7.2%)	555 (8%)	605 (8.8%)	489 (7.6%)
45-50	1511 (19%)	1534 (21.1%)	1439 (20.7%)	1426 (21.2%)	1309 (19%)	1363 (21.2%)
60-64	758 (9.7%)	765 (10.5%)	614 (8.8%)	706 (10.5%)	630 (9.1%)	627 (9.8%)
>65	4624 (54.4%)	4178 (58%)	4169 (60%)	3805 (56.7%)	4177 (60.7%)	3743 (58.2%)
N/D	195 (2.5%)	154 (2%)	179 (2.6%)	168 (2.5%)	127 (1.8%)	136 (2%)
$p=0.164$						
Sex	No. of prescriptions					
Male	2062 (26.5%)	1743 (24.0%)	686 (24.3%)	1678 (25.0%)	1812 (26.3%)	1635 (25.4%)
Female	5718 (73.5%)	5519 (76.0%)	5264 (75.7%)	5030 (75%)	5071 (73.7%)	4792 (74.6%)
Significance (IC 95%): intervention: $p=0.304$; control: $p=0.049$; between intervention and control: $p=0.499$						

Additional file 3. BZD prescription frequency by type of primary health care unit.

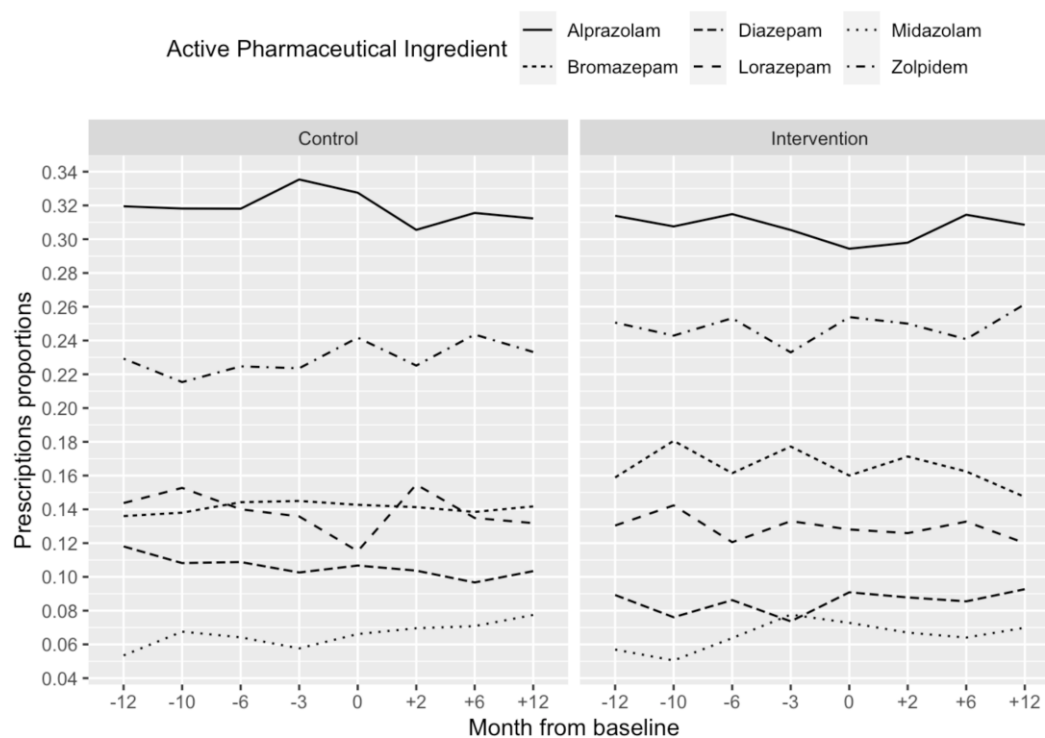
Type of primary health care unit	Baseline		6 months after intervention		12 months after intervention	
	Intervention	Control	Intervention	Control	Intervention	Control
UCSP	3145	2861	2840	2926	2258	2927
USF	4606	4351	4089	3742	4608	3471

$p_{\text{intervention}} \leq 0.001$, $p_{\text{control}} \leq 0.001$.

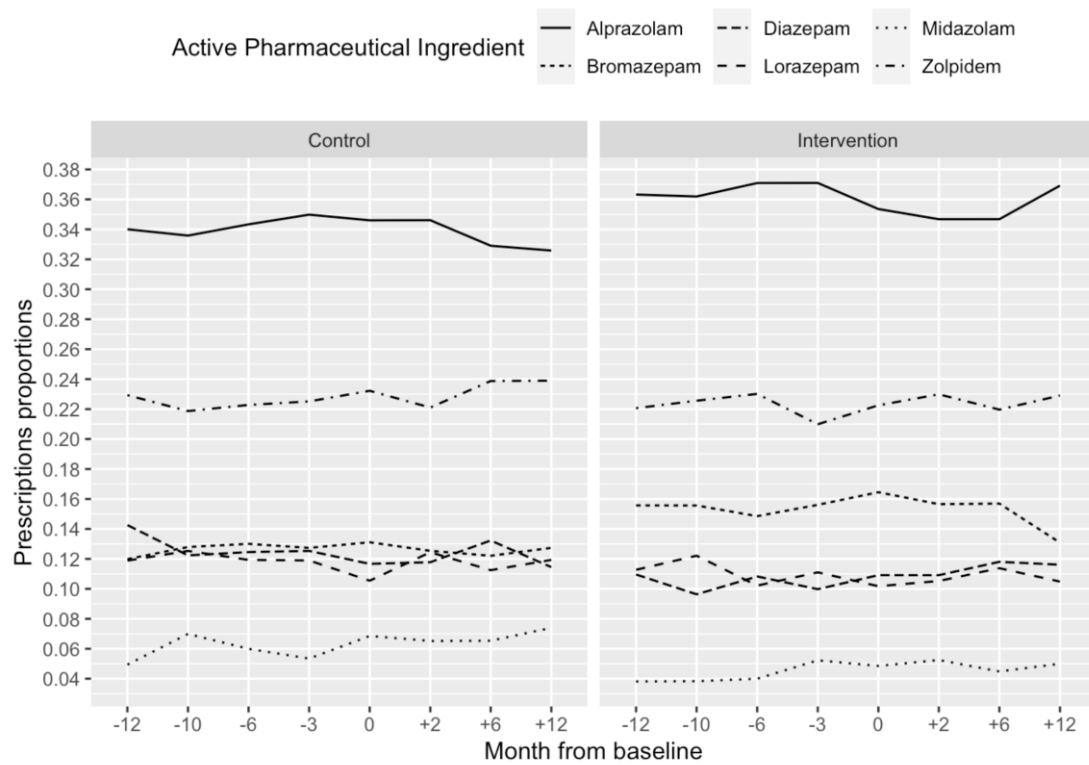
Additional file 4. BZD prescription frequency by active pharmaceutical ingredients.

Most prescribed BZD, n prescriptions	Baseline		6 months after intervention		12 months after intervention	
	Intervention	Control	Intervention	Control	Intervention	Control
Alprazolam	1726 (22%)	1584 (21.8%)	1556 (22.4%)	1451 (21.6%)	1670 (24.3%)	1341 (20.9%)
Zolpidem	1211 (15.6%)	1031 (14.2%)	1074 (15.5%)	1029 (15.3%)	1102 (16%)	963 (15%)
Bromazepam	815 (10.5%)	586 (8%)	734 (10.6%)	539 (8%)	630 (9.2%)	537 (8.4%)
Diazepam	588 (7.6%)	586 (8%)	549 (7.9%)	608 (9%)	580 (8.4%)	507 (7.9%)
Lorazepam	530 (6.8%)	496 (7%)	514 (7.4%)	502 (7.5%)	488 (7%)	496 (7.7%)
Midazolam	282 (3.6%)	297 (4%)	235 (3.4%)	304 (4.5%)	246 (3.6%)	305 (4.7%)

Additional file 5. BZD prescription proportion by active pharmaceutical ingredient to patients over 65 years old.



Additional file 6. BZD prescription proportion by active pharmaceutical ingredient to females.



Additional file 7. Prescription frequency by BZD half-life.

BZD half-life	Baseline		6 months after intervention		12 months after intervention	
	Intervention	Control	Intervention	Control	Intervention	Control
Short	2014 (26%)	2032 (28.2%)	1761 (25.4%)	1908 (28.6%)	1754 (25.5%)	1828 (28.6%)
Medium	4057 (52%)	3581 (49.7%)	3637 (52.5%)	3320 (49.8%)	3667 (53.5%)	3165 (49.4%)
Long	1680 (22%)	1599 (22.1%)	1531 (22.1%)	1440 (21.6%)	1445 (21%)	1405 (22%)
$p_{\text{intervention}}=0.896; p_{\text{control}}= 0.600$						

Additional file 8. Description of diagnosis included in secondary outcome analysis.

Code	Description	Code	Description
P01	Feeling anxious/nervous/tense	P25	Phase of life problem adult
P02	Acute stress reaction	P27	Fear of mental disorder
P03	Feeling depressed	P28	Limited function/disability (P)
P04	Feeling/behaving irritable/angry	P29	Psychological symptom/complaint other
P05	Senility, feeling/behaving old	P70	Dementia
P06	Sleep disturbance	P71	Organic psychosis other
P07	Sexual desire reduced	P72	Schizophrenia
P08	Sexual fulfilment reduced	P73	Affective psychosis
P09	Sexual preference concern	P74	Anxiety disorder/anxiety state
P10	Stammering/stuttering/tic	P75	Somatization disorder
P11	Eating problem in child	P76	Depressive disorder
P12	Bedwetting/enuresis	P77	Suicide/suicide attempt
P13	Encopresis/bowel training problem	P78	Neuraesthesia/surmenage
P15	Chronic alcohol abuse	P79	Phobia/compulsive disorder
P16	Acute alcohol abuse	P80	Personality disorder
P17	Tobacco abuse	P81	Hyperkinetic disorder
P18	Medication abuse	P82	Post-traumatic stress disorder
P19	Drug abuse	P85	Mental retardation
P20	Memory disturbance	P86	Anorexia nervosa/bulimia
P22	Child behaviour symptom/complaint	P98	Psychosis NOS/other
P23	Adolescent behaviour symptom/complaint	P99	Psychological disorders other
P24	Specific learning problem		

Additional file 9. Diagnosis coded at the same month as BZD prescription.

Diagnosis associated to BZD prescription, n (relative %)	Baseline		6 months after intervention		12 months after intervention	
	Intervention	Control	Intervention	Control	Intervention	Control
P76	38 (28.6)	41 (42.3)	40 (28.8)	37 (41.1)	22 (39.3)	20 (29.4)
P74	32 (24.1)	24 (24.7)	35 (25.2)	32 (35.6)	7 (12.5)	22 (32.4)
P06	19 (14.3)	16 (16.5)	33 (23.7)	3 (3.3)	15 (26.8)	4 (5.9)
P01	31 (23.3)	10 (10.3)	25 (18)	7 (7.8)	6(10.7)	6 (8.8)
P70	7 (5.3)	-	6 (4.3)	5 (5.6)	6 (10.7)	14 (20.6)
P03	6 (4.5)	6 (6.2)	-	6 (6.7)	-	2 (2.9)

$p_{intervention}=0.007, p_{control}<0.001$

Additional file 10. Grid analysis of initial and final questionnaires – onsite survey.

Categoria [Designação]	Tipo	Definição da Categoria	Subcategoria	Unidade de Registo¹	Codificação/ Enumeração
Username	Descritiva				#
Unidade	Descritiva			Nome da Unidade a que pertence – esta variável poderia permitir uma análise mais discriminativa das respostas (perceber, por exemplo se nas USF há tendencialmente um tipo de resposta mais frequente- no entanto da análise preliminar tal não parece acontecer, além da amostra de respostas ser reduzida, por isso não me parece que uma análise discriminativa deste género seja relevante	Transcrever
Idade	Descritiva			Idade do profissional de saúde à data de realização do estudo	#
Género	Descritiva			Mulher: 0 Homem: 1	0 1
exp_clin	Descritiva			Anos de experiência clínica: Calculado da subtração entre ano de início de atividade clínica e ano de realização do estudo	#
Uso_plat	Descritiva			Uso da plataforma: Não usaram: 0 Usaram: 1	0 1

¹ A Unidade de Contexto será inserida na aplicação informática de análise de dados.

Categoria [Designação]	Tipo	Definição da Categoria	Subcategoria	Unidade de Registo¹	Codificação/ Enumeração
tem_form				Tem formação específica em saúde mental? Não: 0 Sim: 1 Nota: alteração à base de dados: 0 transformado em 2, logo v.final: Não usaram: 2 Usaram: 1	
qual_form				Caso tenha respondido afirmativamente à pergunta anterior, escolha a opção de formação mais adequada, ou indique a formação específica frequentada: a) Estágio integrado na formação específica em Medicina Geral e Familiar 1 b) Mestrado 2 c) Pós-graduação em saúde mental (não conferente de grau) 3 d) outro 4	
Q1	Descritiva			Como classificaria o seu grau de conhecimento na gestão de pacientes com sintomatologia ansiosa e depressiva? a) Inadequado 1 b) Razoável 2 c) Bom 3 d) Muito bom 4	
Q2	Analítica	Motivos para prescrição de BZDs	Respostas foram subcategorizadas em: motivos corretos (quando a resposta correspondeu a diagnósticos corretos de acordo com guidelines – ex.: relaxamento muscular; sintomas pontuais de	<i>Indique 3 motivos para a sua escolha de prescrição de BZDs.</i>	Transcrever frase(s)/ parágrafo(s)

Categoria [Designação]	Tipo	Definição da Categoria	Subcategoria	Unidade de Registo¹	Codificação/ Enumeração
			ansiedade); motivos incorretos (quando motivos não estavam de acordo com guidelines clínicas (ex.: perturbação de ansiedade; depressão); motivos decorrentes da prática clínica (<i>Reasons arising from daily clinical practice</i>) (ex.: falta de tempo; rapidez de ação do fármaco)	REGRA: transcrever substantivos, adjetivos que qualifiquem ou verbos que ajudem a perceber o sentido.	
Q3	Descritiva			Como se situa quanto à quantidade de antidepressivos que prescreve: a) Nunca prescrevo b) Prescrevo poucas vezes c) Prescrevo algumas vezes d) Prescrevo muitas vezes	1 2 3 4
Q4	Descritiva			Como se situa quanto à quantidade de benzodiazepinas que prescreve: a) Nunca prescrevo b) Prescrevo poucas vezes c) Prescrevo algumas vezes d) Prescrevo muitas vezes	1 2 3 4
Q5	Analítica	Indicação clínica; atuação da medicação; dependência; preferência/escolha pessoal do médico; razões relacionadas com preferência/exigência do utente; outros	Respostas foram subcategorizadas em: • <i>Pathology's characteristics: reasons related to characteristics, and more specifically difficulties in managing symptoms and disorders that first motivated BZD prescription</i> • <i>Patient's characteristics: reasons related with patient's characteristics (ex: requests and even demands)</i> • <i>Prescriber's characteristics: reasons related to prescribers' difficulties in</i>	<i>Indique as 3 principais razões para manter a prescrição de benzodiazepinas</i> REGRA: transcrever substantivos, adjetivos que qualifiquem ou verbos que ajudem a perceber o sentido.	Transcrever frase(s)/parágrafo(s)

Categoria [Designação]	Tipo	Definição da Categoria	Subcategoria	Unidade de Registo¹	Codificação/ Enumeração
			<i>changing prescription or lack of time or knowledge</i> • <i>BZD/drug characteristics: BZD's characteristics such as tolerance and dependence</i>		
Q6	Analítica	Indicação clínica; atuação da medicação; manutenção dos sintomas; preferência/escolha pessoal do médico; conhecimento insuficiente do médico; falta de alternativas; razões relacionadas com preferência do utente; recusa do doente; outros	• <i>Respostas foram subcategorizadas em:</i> • <i>Pathology's characteristics: reasons related to characteristics, and more specifically difficulties in managing symptoms and disorders that first motivated BZD prescription</i> • <i>Patient's characteristics</i> • <i>External factors/environmental context</i> • <i>Knowledge/training</i> • <i>BZD/drug characteristics</i>	<i>Indique as 3 principais dificuldades que sente para alterar a sua prescrição de benzodiazepinas.</i> REGRA: transcrever substantivos, adjetivos que qualifiquem ou verbos que ajudem a perceber o sentido.	Transcrever frase(s)/parágrafo(s)
Q7	Descritiva			Conhece a norma da DGS 055/2011 e a sua atualização de 21/01/2015 relativa ao tratamento sintomático da ansiedade e insónia com benzodiazepinas e fármacos análogos? a) sim b) não	1 2
Q8	Descritiva			Caso tenha respondido afirmativamente à pergunta anterior, como classificaria a utilidade da informação contida nessa norma para adequação da prescrição de benzodiazepinas? a) Inadequada b) Razoável c) Boa d) Muito boa	1 2 3 4

Categoria [Designação]	Tipo	Definição da Categoria	Subcategoria	Unidade de Registo¹	Codificação/ Enumeração
Q9	Descritiva			Como classificaria o seu grau de motivação para participar neste estudo a) Nenhum b) Pouco c) Algum d) Muito	1 2 3 4
Q10	Analítica	Enriquecimento conhecimento; melhoria prática clínica	Respostas foram subcategorizadas em: • <i>Knowledge/training</i> • <i>Practice improvement</i> • <i>Platform structure</i>	<i>Indique as 3 principais motivações para utilizar a plataforma ePrimaPrescribe</i> REGRA: transcrever substantivos, adjetivos que qualifiquem ou verbos que ajudem a perceber o sentido.	Transcrever frase(s)/ parágrafo(s)
Q11	Analítica	Enriquecimento conhecimento; melhoria prática clínica; aspetos práticos da utilização	Respostas foram subcategorizadas em: • <i>Knowledge/training</i> • <i>Practice improvement</i> • <i>Platform structure</i>	Em t0: <i>Indique as 3 principais expectativas em relação à plataforma ePrimaPrescribe</i> Em t12: <i>Indique as 3 principais razões para a resposta à pergunta anterior (motivações)</i> Como perguntas não coincidem nas duas versões eventualmente não a considerar REGRA: transcrever substantivos, adjetivos que qualifiquem ou verbos que ajudem a perceber o sentido.	Transcrever frase(s)/ parágrafo(s)
Q12	Analítica	Barreiras organizacionais; barreiras pessoais; Tempo	Respostas foram subcategorizadas em: • <i>Environmental context and resources: time; technical issues; platform format</i> • <i>Patient's/social pressure</i> • <i>Skills</i> • <i>Motivation</i>	<i>Indique as 3 principais barreiras que espera encontrar em relação à utilização da plataforma ePrimaPrescribe.</i>	Transcrever frase(s)/ parágrafo(s)

Categoria [Designação]	Tipo	Definição da Categoria	Subcategoria	Unidade de Registo¹	Codificação/ Enumeração
			Tempo; disponibilidade; aspetos práticos da utilização; dependência; conhecimentos informáticos; outros	REGRA: transcrever substantivos, adjetivos que qualifiquem ou verbos que ajudem a perceber o sentido.	
Q13	Analítica	Perspetiva Positiva; Perspetiva negativa; Perspetiva relacionada com barreiras	Respostas foram subcategorizadas em: • <i>Positive (Feasible/practicable; Ease of access (technical); Ease of access (knowledge acquisition)</i> • <i>Negative (Technical; Format; Motivation; Time)</i>	<i>Como encara a utilização deste tipo de plataformas de e-learning para a melhoria do conhecimento em áreas específicas de intervenção do médico de família?</i> REGRA: transcrever substantivos, adjetivos que qualifiquem ou verbos que ajudem a perceber o sentido.	Transcrever frase(s)/ parágrafo(s)
Q14	Descritiva			Acha exequível a implementação de programas de formação online como o ePrimaPrescribe? a) sim b) não	1 2
Q15	Analítica	Perspetiva Positiva; Perspetiva negativa; Perspetiva relacionada com barreiras	Respostas foram subcategorizadas em: • <i>Positive (Technical; Ease of access – knowledge; Convenience; Practice improvement)</i> • <i>Negative (Time; Technical; Motivation)</i>	<i>Indique 3 razões para a sua resposta à pergunta anterior.</i> REGRA: transcrever substantivos, adjetivos que qualifiquem ou verbos que ajudem a perceber o sentido.	Transcrever frase(s)/ parágrafo(s)
Q16	Descritiva			Considera que a utilização da plataforma ePrimaprescribe terá impacto na alteração do seu padrão de prescrição de benzodiazepinas? a) sim b) não	1 2

Categoria [Designação]	Tipo	Definição da Categoria	Subcategoria	Unidade de Registo¹	Codificação/ Enumeração
Q17	Analítica	Perspetiva Positiva; Perspetiva negativa; Perspetiva relacionada com barreiras	Respostas foram subcategorizadas em: • <i>Positive (Knowledge; Behavior regulation; Motivation; Technical; Translation into practice)</i> • <i>Negative</i>	<i>Indique 3 razões para a sua resposta à pergunta anterior.</i> REGRA: transcrever substantivos, adjetivos que qualifiquem ou verbos que ajudem a perceber o sentido.	Transcrever frase(s)/ parágrafo(s)
Q18	Descritiva			Concorda com o indicador estabelecido para as USF quanto à monitorização da quantidade de benzodiazepinas prescritas a pessoas com mais de 65 anos? a) sim b) não	1 2
Q19	Descritiva			Acha que faria sentido a inclusão de novos indicadores relativos à monitorização do estado da saúde mental em pessoas com ansiedade e depressão em cuidados de saúde primários? a) sim b) não	1 2
Q20	Analítica	Perspetiva Positiva; Perspetiva negativa	Respostas foram subcategorizadas em: • <i>Positive (Evaluation benefits; Mental Health epidemiology; Resource accounting)</i> • <i>Negative</i> Perspetiva positiva: melhoria da qualidade do cuidado	<i>Indique 3 razões para a sua resposta à pergunta anterior.</i> REGRA: transcrever substantivos, adjetivos que qualifiquem ou verbos que ajudem a perceber o sentido.	Transcrever frase(s)/ parágrafo(s)

Categoria [Designação]	Tipo	Definição da Categoria	Subcategoria	Unidade de Registo¹	Codificação/ Enumeração
Q21	Analítica	Indicadores organizacionais; indicadores de desempenho; indicadores de resultado; indicadores processuais	Perspetiva negativa: deturpação da utilização dos indicadores		
		ou De prescrição; de estado clínico; de internamento/ utilização de serviços	Respostas foram subcategorizadas em: • <i>Prescription evaluation</i> • <i>Diagnostic evaluation</i> • <i>Clinical state/severity monitoring</i> • <i>Resource utilization</i> • <i>Patient satisfaction</i>	<i>Caso tenha respondido afirmativamente à questão 21. sugira quais os indicadores que consideraria adequado incluir relativos à monitorização do estado da saúde mental em pessoas com ansiedade e depressão em cuidados de saúde primários.</i> REGRA: transcrever substantivos, adjetivos que qualifiquem ou verbos que ajudem a perceber o sentido.	Transcrever frase(s)/ parágrafo(s)
Q22	Descritiva			Acha que faria sentido existirem incentivos ao seguimento adequado de pessoas com ansiedade e depressão nos cuidados de saúde primários, à semelhança do que acontece em relação à diabetes? a) sim b) não	1 2

Question 2 (Q2) – Motifs for prescribing BZD

Correto t0 (total 31)	Correto t12 (total 31)
necessidade em algumas comorbilidades	agitação
crise de pânico	crises de ansiedade motivados por situações indutoras de stress
ansiedade aguda com sintomas somáticos	como relaxante muscular em situações de espasmos musculares, rigidez
ansiedade de instalação súbita	início de terapêutica síndrome depressivo/ansiedade
fase inicial de depressão	SOS crises de pânico
relaxante muscular	raramente no sono
controlo da ansiedade em situação pontual	crises de pânico
coadjuvante de antidepressivo	ataques de pânico
relaxante muscular	ansiedade – episódios isolados, pouco frequentes, esporádicos
crises de ansiedade	ansiedade – nas primeiras semanas quando se inicia antidepressivo e depois apenas em SOS
tratamento em curto espaço de tempo dos sintomas	início de tratamento com antidepressivo
crises de ansiedade graves	controlo da ansiedade em SOS
eventos de vida indutores de stress	indução do sono em SOS
ansiedade ligada a acontecimentos pontuais de vida	P. depressiva com sintomas ansiosos no início do tratamento
perturbação de ansiedade aguda	Tx com duração curta
tratamento curto de doença aguda ou agudização de doença crónica	P ansiedade, com sintomas ansiosos intensos, no início do tratamento, esquema de tx curto
associação com início da terapêutica antidepressiva	crises de pânico
sintomas de ansiedade	ansiedade/distúrbio ansioso num curto espaço de tempo
adjuvante terapêutica antidepressiva	quadro ansioso agudo
reação aguda de ansiedade	relaxante muscular
crises de pânico	sedação
início de tratamento de ansiedade juntamente com antidepressivos	início concomitante com início de antidepressivo
episódios agudos de ansiedade com duração inferior a 8 semanas	crises de ansiedade aguda por curta duração
alguns como relaxantes musculares (ex. diazepam)	tratamento agudo da ansiedade
crise aguda ansiedade/Pânico	sintomas agudos
início terapêutica antidepressiva com risco suicídio	quadros psicóticos

Correto t0 (total 31)	Correto t12 (total 31)
início de agitação aguda para controlo sintomático	crise de ansiedade (pontualmente)
episódios de ansiedade intermitente	agitação (pontualmente)
como ansiolítico na fase aguda	insónia (pontualmente ou em situação terminal)
nas crises de pânico em SOS	relaxante muscular de curta duração de tratamento
síndrome depressiva (início de terapêutica antidepressiva)	início da terapêutica antidepressiva

Incorreto t0 (total 51)	Incorreto t12 (total 47)
alteração ansiosa com repercussão na comunidade e família	alívio da ansiedade
ansiedade	falta de energia
ansiedade	ansiedade
ansiedade	ansiedade
ansiedade	ansiedade
ansiedade	ansiedade
ansiedade em doente com depressão	ansiedade
ansiedade generalizada	ansiedade
ansiedade generalizada	ansiedade
ansiedade generalizada	ansiedade
ansiedade generalizada	ansiedade
ansiedade muito sintomática	ansiedade
como indutor de sono	ansiedade com repercussão funcional
continuidade da prescrição	ansiedade crónica
crises ansiosas frequentes	ansiedade generalizada
depressão	cessação tabágica
depressão	como ansiolíticos
distúrbio de ansiedade e pânico	como indutores de sono em situações de insónia
em caso de tolerância e dependência	depressão
grande incidência de ansiedade	depressão
indução do sono	depressão
indução do sono	efeito no sono
insónia	em algumas doenças crónicas
insónia	grande intensidade de ansiedade
insónia	insónia
insónia	insónia
insónia	insónia
insónia	insónia
insónia	insónia

Incorreto t0 (total 51)	Incorreto t12 (total 47)
insónia	insónia
insónia	insónia
insónia inicial	insónia
insónia inicial	insónia persistente
insónias	intensa clínica ansiosa
instabilidade emocional	melhora a ansiedade
irritabilidade	níveis de ansiedade
irritabilidade marcada	patologia músculo-esquelética
luto	perturbação de ansiedade
neurose de ansiedade	perturbação de pânico
pânico	perturbação de sono
patologia do sono	perturbação de sono
perturbação da ansiedade	perturbação do sono
perturbação de ansiedade	perturbação do sono
perturbação de ansiedade	perturbação do sono
perturbação de ansiedade	perturbação do sono no idoso
perturbação de pânico	quadros de ansiedade
perturbação de sono	sintomas depressivos
perturbação do sono	
perturbação do sono	
perturbação relacionada com o pânico	
síndrome ansioso	
situações de ansiedade e angodepressividade cada vez mais frequentes	
tratamento da ansiedade	
tratamento das insónias	
tratamento de stress pós-traumático	

Decorrente da prática t0 (total 18)	Decorrente da prática t12 (total 28)
aceitação	alguma prática
ausência de praticamente total resposta de psicoterapia	ansiolítico eficaz
continuidade da prescrição	conhecimento que tenho das substâncias/lidar com elas à vontade
continuidade de terapêutica	dificuldade em suspender terapêutica
dificuldade de interromper a terapêutica	efeito rápido a atuar
doentes em que vem iniciado pelo psiquiatra	eficácia
eficácia	eficácia
eficácia dos fármacos	eficácia
fáceis de adaptar a cada doente	eficácia
falta de tempo na consulta	facilidade
muito eficazes no controlo da ansiedade	facilidade de desmame
não receito muito	facilidade de manejo
o hábito	falta de tempo para falar com os utentes
prescritos nas urgências	hábito
quase exigido pelo utente que não consegue retirar	observação de sofrimento interno
segurança	pedido do doente
tentar resolver a situação clínica	pressão assistencial
tolerância	pressão exercida pelos utentes
	rapidez
	rapidez de ação
	rapidez de ação
	rapidez de ação
	resistência dos doentes ao abandono da medicação iniciada há vários anos
	resposta ao efeito de atuação
	resposta rápida
	resultados satisfatórios quase sempre
	seguros
	suavidade das BZDs

Question 7 (Q7) – Main reasons to keep BZD prescription

Características da patologia t0	Características da patologia t12
Manutenção das causas subjacentes às queixas	situação/problema de base não resolvido
manutenção das queixas	prevalência da ansiedade na vida das pessoas
agravamento das queixas	prevalência de patologia osteoarticular com necessidade de relaxantes musculares
ansiedade grave, em períodos curtos	prevalência de distúrbios de sono
graves crises ansiosas	doentes com ansiedade
persistência das queixas	doentes com insónia
incidência da patologia	doentes com crises de pânico
recaídas	não controlo sintomático do utente
ansiedade generalizada com complemento de psicoterapia	perturbação de sono
ainda não há melhoria da sintomatologia	persistência dos sintomas de ansiedade
manutenção da sintomatologia que motivou o início	manutenção de sintomas
manutenção de sintomas de ansiedade	mantém o mesmo problema
perturbação de sono	agravamento da situação
persistência das queixas	idosos que tomam BZDs por perturbação do sono
as causas que determinam as queixas mantêm-se	insónia
ao retirar os doentes voltam a referir sintomatologia	ansiedade
não melhoria	ataques de pânico
situação de doença crónica	fobia social
agravamento sintomático	ansiedade – episódios isolados, pouco frequentes, esporádicos
insónia	ansiedade – nas primeiras semanas quando se inicia antidepressivo e depois apenas em SOS
caso de utentes com sintomatologia ansiosa	utente com referência a sintomatologia secundária à introdução de antidepressivos
tratamento crónico	uso em pico de crise em utente com ataques de pânico
insónia	indicação clínica mantém-se
situações agudas de stress (morte de familiar, etc.)	insónia
pessoas com tendência crónica para ansiedade	ansiedade
pessoas com problemas pessoais que motivam a ansiedade e que não conseguem modificar a sua vida	4 semanas iniciado no tratamento antidepressivo
uso na crise de agudização ansiosa	controlo da irritabilidade/disfunção social
uso na agitação aguda	

Características dos utentes t0	Características dos utentes t12
resistência pelo utente	resistência à retirada por parte do doente
pressão por parte dos doentes para a prescrição (por dependência)	imposição do utente
pressão do doente referindo não suportar a retirada do fármaco	pedido dos utentes
dificuldade de adesão do doente à diminuição da terapêutica	utentes que já fazem este fármaco há muito tempo e que não querem novos
dificuldade de perceção do doente que pode viver sem BZDs	exigência do doente
recusa do utente à descontinuação	pedido do doente
pedido do utente	adesão à terapêutica
não aceitação do utente	não adesão do doente à paragem de prescrição
o doente pede	doentes com terapêutica há muito tempo que não querem deixar
má adesão do doente em parar	resistência dos doentes ao abandono da medicação iniciada há vários anos
muito pouca colaboração do doente para reduzir/parar a medicação	falta de motivação dos doentes
persistência do utente	pressão dos doentes
solicitação dos utentes	doente não quer parar
resistência à suspensão/desmame	doente não consegue parar
resistência no desmame por parte do utente	doente não ter benefícios
pressão do doente	pouca motivação dos doentes
recusa dos doentes em retirar	utente que faz cronicamente e não quer deixar
habituação do doente com ansiedade generalizada ao retirar	a insistência do doente;
exigência dos doentes	a pedido do doente
resistência dos doentes à suspensão dos fármacos	pressão dos doentes
utente que já faz há muitos anos	o principal é a demanda insistente do doente
insistência dos doentes	pedido do doente
o utente não cumpre	
demanda insistente do utente	
insistência do doente	
difícil desmame / consciencializar o doente	
efeito do desmame	

Características do prescritor t0	Características do prescritor t12
prática/conhecimento	dificuldade na desprescrição
comodidade	falta de tempo
falta de tempo	falta de tempo para desmame
falta de tempo para colaborar com o doente	falta de paciência
falta de sensibilização por parte da psiquiatria	por vezes não tenho disponibilidade mental para lutar contra esta atitude
conselho do orientador de formação	hábito
indicação de colegas de outra especialidade	prescrição em consulta hospitalar
renovação de prescrições anteriores	incapacidade em conseguir uma desabitação eficaz
falta de conhecimento sobre como fazer desmame de BZDs	falta de tempo
não querer alterar a prescrição de outros colegas	dificuldades em parar
tento fazer o desmame e volta com BZDs do especialista ou da urgência	conhecimento limitado em relação à melhor forma de suspender
iniciado por outro médico	não querer alterar medicação iniciada por outros colegas
Difícil estabelecer o final da prescrição	dificuldade em fazer desmame
Dificuldade na descontinuação em doentes que tomam cronicamente	dificuldade no desmame
Doentes idosos com doses muito baixas de BZDs em que é muito difícil retirar a medicação	dificuldade em suspender;
difícil fazer desmame	a noção que dependência (como fazer?)
dificuldade em reduzir	
dificuldade no desmame	
dificuldade na descontinuação	
dificuldade em suspender	
muito difícil desmame	
dificuldade em fazer a desabitação dos doentes	

Características da BZD/fármaco t0	Características da BZD/fármaco t12
rapidez de ação	benefício percebido da sua utilização
controlo rápido de sintomas/sofrimento	efeito rápido
bons resultados	controlo da irritabilidade/disfunção social
controlar mais eficazmente sintomas ansiosos	controlo de sintomas
controlar num curto espaço de tempo os sintomas	eficácia
eficácia no controlo da ansiedade	eficácia
alívio sintomático das crises de ansiedade	rapidez de ação
resposta eficaz dos sintomas mais incómodos dos doentes	serem bons fármacos
melhoria clínica	efeito rápido facilmente percebido pelo utente
controlo sintomático adequado	alívio sintomático apenas em SOS
Dependência	tolerância
Dificuldade em lidar com síndrome de dependência	dependência
dependentes	dependência
dependência do fármaco	dependência do fármaco
dependência do fármaco	doente dependente
dependência	habituação à droga
dependência do doente	habituação
dependência	dependência é causa/efeito
dependência	
dependência	

Question 8 (Q8) – Main difficulties to change BZD prescription

Características da patologia t0	Características da patologia t12
agravamento dos sintomas	dificuldade em fazer desmame
lidar com crises de grande ansiedade	dificuldade com o desmamar
recidiva da patologia clínica	dificuldade em controlar os sintomas
sintomas paciente	sempre sintomática
agravar a situação clínica do doente	necessidade de obter resultados mais rápidos nalguns casos
aumento dos sintomas somáticos	dificuldade em controlar sintomas quando se retiram as benzodiazepinas
ter outra molécula que atue tão eficazmente sobre ansiedade	dificuldades em parar
queixas relacionadas com o desmame	uso crónico e continuado de muitos anos pelos idosos
as causas que determinam as queixas mantêm-se	patologia psicológica menor
ao retirar os doentes voltam a referir sintomatologia	risco de suicídio
idosos que fazem há muitos anos	dificuldade no recomendar de fármacos que consigam proporcionar o mesmo ganho e efeito
os sintomas de descontinuação dos mesmos	dificuldade na desprescrição
dificuldade/impossibilidade de alteração dos fatores que motivam a ansiedade	dificuldade em alterar as situações que criam stress na vida dos utentes

Características de pressão social dos utentes t0	Características de pressão social dos utentes t12
resistência por parte do doente	alguma resistência por parte do utente
Recusa do utente	resistência por parte dos utentes em reverter o uso de BZDs
resistência do utente	pressão dos doentes
recusa do doente em alterar a medicação	resistência dos doentes e familiares à retirada
pressão do utente	recusa do doente
utente	intolerância à mudança
a aderência do doente	convencer o doente
má adesão do doente em parar	pressão dos utentes
pouca aceitação do doente ou negação	vontade dos utentes em manter estes fármacos
pouca colaboração do doente mesmo que informado dos inconvenientes existentes com esta medicação	pressão do utente
colaboração do doente/ dependência do doente	exigência do doente
insistência do doente	exigência do doente
resistência do doente	o próprio doente
confiança do doente no especialista que faz a 1ª prescrição	utentes difíceis
dificuldade dos doentes em adaptar-se a outras tx	não colaboração do doente
resistência do doente	doentes com terapêutica há muito tempo que não querem deixar
recusa dos doentes em retirar	doentes a tomar benzodiazepinas há muito tempo
não aderência do utente à retirada	resistência dos doentes à sua suspensão
utente sente alívio agudo imediato e não quer deixar	resistência do doente
utente com receito de dependência de antidepressivos e usa ansiolíticos em vez disso	resistência dos colegas
idosos	resistência dos utentes
a interrupção de hábitos dos utentes de vida errados	resistência das pessoas em fazer o desmame
dificuldade na compreensão dos utentes	falta de motivação dos doentes
o utente não cumpre	pressão dos doentes
pressão do utente	pouca vontade do paciente
falta de paciência do utente	pouca receptividade por parte dos doentes
informar e consciencializar o doente	a recusa do utente
	não aceitação do utente
	negativa de doente
	recusa do doente em deixar
	resistência do doente

Fatores externos / Contexto ambiental t0	Fatores externos / Contexto ambiental t12
tempo para atendimento reduzido	falta de tempo por vezes na consulta (múltiplos problemas na mesma consulta)
falta de apoio de psicologia	necessidade de consultas próximas
pouco tempo de consulta	falta de tempo para desmame
falta de tempo nas consultas para melhor gerir esta problemática	ausência de alternativas como tratamento complementar com psicoterapia
tempo na consulta	possibilidade de compra nas farmácias sem prescrição prévia
pouco tempo para conseguir motivar o doente a alterar a medicação ou adotar outros estilos de vida ou outras terapias	falta de tempo
restrição do tempo de consulta	pouco tempo de consulta por doente
falta de tempo na consulta	dificuldade em marcar consultas com pouco tempo de intervalo
a necessidade de tempo de consulta acrescido e da vigilância/periodicidade das consultas	prescrição de outros médicos (MGF/Psiquiatria)
precisava uma consulta com mais tempo para explicar ao utente a importância do desmame de BZDs	o utente vai à urgência e vem com BZD
vão a outro médico e voltam com outra BZD	o utente vai à psiquiatria e vem com BZD
não poder dedicar mais tempo ao utente	tempo

Conhecimentos / Formação t0	Conhecimentos / Formação t12
Preparação inadequada	alterar para outras com menos adição
Pouco experiência na utilização de fármacos	escolher outro caminho
falta de experiência	falta de paciência
conhecimento exato de farmacologia	por vezes não tenho disponibilidade mental para lutar contra esta atitude
o trabalho que isso implica	hábito
incerteza/desconhecimento da prescrição	pouca experiência/formação com medicação alternativa
comorbilidade para o MF	não conhecer totalmente as diferenças entre as diversas BZDs
não saber fazer bem a redução da medicação de forma a que o doente, já dependente, adira	não ter segurança suficiente para trocar BZDs
desconhecimento do esquema de desmame	
falta de conhecimento em relação a esquema de desmame	
falta de formação	
pouca experiência com tx alternativos	
saber quais os melhores fármacos para substituição	
fazer o desmame corretamente	
manuseamento de doses (equivalência de efeitos)	
adequar o tipo de BZDs	
nem sempre tenho consciência da necessidade ou benefício de o fazer	
dificuldade em lidar com a descontinuação de benzodiazepinas	

Características da BZD/fármaco t0	Características da BZD/fármaco t12
dependência	preocupação com a dependência
dependência dos utentes relativamente às BZDs	dependência
dependência	dependência
grande dependência apresentada por alguns utentes	dependência
dependência do fármaco	dependência
dependência do fármaco	boa experiência/eficácia
preço	dependência física/patológica
dependência	habituação à droga
dependência	serem bons fármacos
dependência	dependência de benzodiazepinas
dificuldade de transição entre diferentes BZDs	habituação
dependência	duração da ação
dependência do utente;	redução da dose
dependência	eficácia e segurança da alternativa
dependência	
dependência do doente	

Question 12 (Q12) – Main motivations to use the ePrimaprescribe

Conhecimentos / Formação t0	Conhecimentos / Formação t12
aumento do conhecimento	atualização de conhecimento
ter mais informação/conhecimento sobre BZDs	para procurar estar atualizada
ter mais informação sobre outros medicamentos	aprendizagem
ter mais conhecimento da terapêutica de descontinuação	atualização formativa
conhecimento geral	para obter conhecimentos
conhecimento do manuseamento BZDs	atualização
conhecimento na desabitação/desmame	melhoria de conhecimento
melhorar conhecimento	melhoria de diagnóstico
aumento do conhecimento sobre o tema	atualização
esclarecimento de dúvidas	tirar dúvidas
evitar dependências iatrogénicas	atualização
aquisição de conhecimentos	ampliar conhecimento
aquisição de conhecimentos	ausência de formação disponível nesta área
aprendizagem de técnicas de descontinuação	necessidade de atualização
utilização de antidepressivos e ansiolíticos	esclarecimento de dúvidas
atualização de conhecimentos	atualização de conhecimentos
descontinuação de BZDs	necessidade de informação auxiliar para desmame de benzodiazepinas
melhorar os conhecimentos na utilização de bZDs	necessidade de informação auxiliar para evitarmos o início de benzodiazepinas
tratamento da ansiedade e depressão sem uso de BZDs	aumentar o conhecimento nesta área
gestão da dependência e sugestões para descontinuação de BZDs	aprender esquemas de desabitação
aquisição de conhecimentos	estudo das melhores estratégias para o tratamento da ansiedade;
bom uso de BZDs	informação muito útil
informação	melhoria de conhecimento
formação	aumentar conhecimento sobre BZDs
adquirir conhecimento	interesse no tema
ampliar conhecimentos	necessidade de adquirir alguns conhecimentos
adquirir conhecimento	atualização em formação
atualização na prescrição medicamentosa	aprender a fazer descontinuação de BZDs
adquirir mais competências na área da saúde mental	informação sobre BZDs
atualização de conhecimentos	melhorar conhecimento na área
atualização de conhecimentos	

Conhecimentos / Formação t0	Conhecimentos / Formação t12
aprendizagem em relação ao modo mais correto de utilizar esta medicação	
revisão das indicações terapêuticas, esquemas	
revisão de conhecimentos	
aquisição de novos conhecimentos	
aprender mais	
formação	
aquisição de conhecimentos	
aumento de conhecimento	
melhorar os conhecimentos	
saber tratar melhor perturbações depressivas	
procura de informação correta e adequada	
aquisição de conhecimento	
melhores regras de utilização de BZDs	
esclarecer dúvidas	
ajudar na melhoria do uso de psicofármaco	
atualização	
melhorar a minha formação	
aquisição de novos conhecimento	
esclarecimento de dúvidas	

Melhoria da prática clínica t0	Melhoria da prática clínica t12
melhor gestão da terapêutica	melhoria na qualidade da prescrição
melhorar a prática clínica	para tentar melhorar a prática clínica nesta área
ser prescritor	melhoria da qualidade da prestação de cuidados
monitorizar efeitos iatrogénicos das BZDs	casos clínicos
melhor abordagem na utilização de BZDs	melhorar tratamento
benefício do utente	benefício do utente
utilidade	ajudar os utentes resistente
auxílio em deixar a medicação por parte do doente	estratégias para desprescrever BZDs
facilidade em lidar com as benzodiazepinas	ganhar ferramentas para uma prescrição mais correta
facilidade em lidar com os antidepressivos	aquisição de ferramentas e técnicas
ter acesso a ferramentas uteis para a minha prática clínica	melhorar a diminuição de BZDs na lista de utentes
melhorar a prática clínica	perceção da necessidade de melhorar
melhorar a saúde das pessoas	modificar escolhas na prescrição
melhorar as prescrições de antidepressivos e BZDs	
saber fazer a descontinuação de BZDs	
servir de suporte à prescrição e sua adequação	
melhoria da nossa clínica	
melhorar a minha prática clínica	
melhorar a minha qualidade na atenção	
melhorar minha qualidade na prescrição	
conseguir convencer o doente a deixar a BZD	
menos prescrição de BZD	
mais benefício para o doente	
adequar as prescrições	
articulação	
gerir as dificuldades na descontinuação das benzodiazepinas	
ajuda no desmame de BZDs	

Estrutura da plataforma t0	Estrutura da plataforma t12
módulos curtos e com horário livre de acesso	inovação
atualização de conhecimento	plataforma bem organizada
fácil acesso	metodologicamente bem estruturada
módulos rápidos e práticos	
horário flexível	
poder utilizar a plataforma sempre que tiver dúvidas	
facilidade acesso informático	

Question 13 (Q13) – Expectations: understanding the outcomes that were expected apart from the reasons leading to participation (evaluated in previous question)

Conhecimentos / Formação t0	Conhecimentos / Formação t12
melhorar competência nesta área	melhoria de conhecimentos
novos conhecimentos	melhoria de conhecimentos
melhorar a capacidade de lidar com a terapêutica da ansiedade	diagnostico adequado
aumento do conhecimento	novos conhecimentos adquiridos
ter mais informação/conhecimento sobre BZDs	atualização de conhecimentos;
ter mais informação sobre outros medicamentos	sistematização do conhecimento
ter mais conhecimento da terapêutica de descontinuação	informação muito útil
informação atualizada	permitiu melhorar conhecimento
atualização médica	aprendi coisas novas
responder a algumas dúvidas	aprendi a fazer descontinuação
melhorar os conhecimentos sobre o uso de BZDs	
articulação de conhecimentos	
atualização de conhecimentos	
formação	
melhorar conhecimentos sobre BZDs e antidepressivos	
atualização de conhecimentos	
aprendizagem em relação ao modo mais correto de utilizar esta medicação	
melhorar os conhecimentos	
aprender	
aprender novos conhecimentos em relação ao tratamento da depressão e ansiedade	
alternativas se efeitos secundários	
gerir as agudizações	
melhorar regras de utilização de BZDs	
atualização	
melhorar a minha formação	
informação de qualidade	
aquisição de capacidades / ferramentas de prescrição mais adequadas	

Melhoria da prática clínica t0	Melhoria da prática clínica t12
alcançar alguns resultados positivos na minha prática	orientação sobre otimização da prescrição
melhoria da prática clínica	orientação sobre desmame
conseguir diminuir o uso de ansiolíticos	maior segurança
melhorar a capacidade de conseguir descontinuar alguns tratamentos crónicos de BZDs	esclarecer dúvidas do dia-a-dia
melhorar a satisfação e desempenho profissional	resposta às questões a que se propunha
melhorar as minhas capacidades para prescrição e desabituação de BZDs	define estratégias para o controlo de sintomas
contribuir para diminuir o n.º de prescrições de BZDs	define quadros clínicos
contribuir para diminuir as alterações cognitivas dos doentes	prática médica
melhoria na utilização clínica de BZDs	
tratamento adequado das perturbações de pânico e ansiedade	
tratamento adequado da perturbação depressiva	
tratamento da ansiedade e depressão sem o uso de BZDs	
bom uso da prescrição	
suporte para prescrição	
ajuda no tratamento do utente	
corrigir erros terapêuticos que possa estar a fazer	
utilidade na prática clínica	
resumos adequados para a resolução de casos clínicos nos cuidados de saúde primários	
saber lidar melhor com estes doentes	
ter acesso a ferramentas uteis para a minha prática clínica	
melhoria da minha atividade clínica	
fornecer alternativas à prescrição de BZDs	
melhorar a prescrição	
descontinuação	
melhoria da prática clínica	
melhorar as ferramentas de trabalho para lidar com ansiolíticos e antidepressivos	
melhorar a saúde dos doentes	
saber manusear antidepressivos e BZDs	
participar num estudo que pode melhorar a relação entre os cuidados de saúde primários e psiquiatria	
truques que ajudem a diminuir o consumo	
que promova a adoção das boas práticas	

Melhoria da prática clínica t0	Melhoria da prática clínica t12
utilidade	
benefício à prática clínica;	
melhorar a minha prática clínica	
melhorar a minha qualidade na atenção	
melhorar minha qualidade na prescrição	
conseguir convencer o doente a deixar a BZD	
menos prescrição de BZD	
mais benefício para o doente	
resposta a dúvidas / problemas da prática clínica	
melhorar a satisfação do doente com a terapêutica	
informação orientada para a prática	
ajuda	
manter a mudança	

Estrutura da plataforma t0	Estrutura da plataforma t12
intuitivo	disponibilidade de informação
gráficos apelativos	clareza da informação
facilidade de acesso	casos práticos/exemplos
facilidade de aplicação	bastante didática
esclarecedor	bom instrumento de consulta, no futuro e no presente
sucinta	bem apresentado
útil	seria melhor para consulta nomeadamente quando era necessário desprescrever
informação simples e resumida	informação bem estruturada e sistematizada
facilidade de acesso	falta de tempo
conteúdos pertinentes e uteis	falta de motivação
que se seja fácil de usar	boa abordagem dos problemas
que seja prática e se adeque ao acesso na USF	sempre disponível
informação esquemática	organização facilitada por tabelas
resposta rápida	acessibilidade em caso de necessidade
	fácil acesso
	percetível
	adaptada à prática clínica
	resumos claros e sucintos
	fácil da ótica do utilizador
	falta de investimento próprio
	plataforma bem organizada
	metodologicamente bem estruturada
	explícita
	acessível
	simples
	falta de tempo
	dificuldade em manter a atenção ao longo dos temas
	dificuldade no acesso no momento pretendido
	não consegui visualizar muitos dos vídeos
	organização pouco intuitiva

Question 14 (Q14) – Barriers to use ePrimaPrescribe platform

Contexto ambiental e recursos t0	Contexto ambiental e recursos t12
Tempo:	Tempo:
necessidade de um tempo extra	tempo
falta de tempo	falta de tempo
tempo/limitações	falta de tempo
tempo	falta de tempo
disponibilidade de tempo	tempo
tempo disponível	falta de tempo
tempo disponível	principalmente falta de tempo disponível
falta de tempo	tempo
falta de tempo para consulta do programa	falta de tempo
falta de tempo para o uso do programa	tempo
tempo	falta de tempo
tempo	indisponibilidade de tempo
falta de tempo	tempo
tempo disponível	
falta de tempo	
ter pouco tempo na utilização	
falta de tempo	
tempo	
tempo	
tempo disponível	
falta de tempo	
limitação de tempo	
tempo	
falta de tempo	
falta de tempo	
o tempo	
tempo	
falta de tempo	
tempo	
tempo	
agenda	

Contexto ambiental e recursos t0	Contexto ambiental e recursos t12
Questões técnicas:	Questões técnicas:
eventual problema com plataforma(informática)	impossibilidade de aceder a ficheiros com áudio no local de trabalho
acesso à plataforma	não temos computadores com som para poder consultar no momento da consulta com doente para tirar dúvidas
necessitar de ter um computador disponível	
a internet da USF	
capacidade do sistema informático de aceder à plataforma na USF	
dificuldade no acesso a computadores na USF	
os computadores da USF não permitem ouvir som	
não poder ser usado na USF (não temos áudio)	
acesso	
problemas técnicos informáticos	
acessibilidade	
facilidade de acesso	
acesso restrito a vídeos em horário de trabalho	
Formato da plataforma:	Formato da plataforma:
mais uma plataforma para entrar	extensão das apresentações
ter de ver todo o vídeo para encontrar uma informação	extensão das sessões
a imensidão de programas	ausência de pdf/word desligando a visualização se necessário
utilidade	necessidade de palavra pass para acesso
ferramenta digital	dificuldade no acesso no local de trabalho
utilização em real time	não faz referência aos antidepressivos a usar e em que doses
informação face à prática clínica de MGF	tem de ser usado no pouco tempo extra disponível (supostamente o tempo de atenção à nossa saúde mental e familiar)
	pouca interatividade
	chegou uma altura em que já não aparecia nada de novo
	organização pouco intuitiva

Pressão social dos utentes t0	Pressão social dos utentes t12
insistência dos doentes	
aderência do doente às terapêuticas	
Skills t0	Skills t12
informática	conhecimentos
poucos conhecimentos informáticos	barreira informática
limitações pessoais a nível de informática	
disponibilidade pessoal na questão informática	
Motivação t0	Motivação t12
disponibilidade	falta de disponibilidade mental (<i>burnout</i>)
disponibilidade	disponibilidade pessoal
disponibilidade	disponibilidade
a pouca disponibilidade para a formação	esquecimento
o excesso de trabalho diário e cansaço daí decorrente	disponibilidade pessoal
esquecimento	disponibilidade
disponibilidade	esquecimento
ter de aceder a plataforma em horário pós-laboral	tem de ser usado no pouco tempo extra
dificulta a aderência	disponível (supostamente o tempo de atenção à nossa saúde mental e familiar)
	disponibilidade

Question 15 (Q15) – Perceptions over e-learning platforms (applied to continuous medical education).

Positivo t0	Positivo t12
Exequível / Praticável:	Exequível / Praticável:
agrada-me	útil
já realizei várias formações noutros âmbitos via elearning	com bons olhos
ótima ideia	são úteis
pertinente	bastante interessantes
excelente	ferramenta útil
é útil	muito produtiva
boa	poderá ter alguma utilidade
concordo plenamente	fundamental
ideal	acho interessante e útil
acho muito interessante e utilidade para lidar melhor com estas doenças e doentes	muito positiva e bem-vinda
encaro com grande satisfação	são plataformas úteis
são muito úteis	é um bom instrumento, acessível e que permite uma consulta rápida
útil	de grande utilidade
de utilidade, sobretudo se houver interligação	muito útil
comodidade	de forma muito positiva e com utilidade
bem	muito bem!
penso que são muito uteis para completar os conhecimentos em áreas mais específicas, mas muito comuns nos cuidados de saúde primários	podem ser úteis
são uteis	considero que é benéfica e interessante, sendo uma mais-valia para o MGF
de maneira positiva	
razoavelmente	
bem, em princípio fácil de aplicar	
considero este tipo de plataformas de extrema importância	
Facilidade de acesso (técnico):	Facilidade de acesso (técnico):
vantagem de ser acessível quando é possível, com o tempo em que me é possível	sem termos de nos deslocar do nosso local de trabalho
fácil	adequadas para que tenha facilidade de manuseamento
fácil utilização	evitar a deslocação a outras cidades e aceder a conteúdos a qualquer hora é uma especial mais-

Positivo t0	Positivo t12
permitindo a cada um gerir o seu tempo, com uma certa flexibilidade de horário já tendo frequentado algumas plataformas e assumo total mais-valia facilidade e comodidade no acesso à formação permite-nos estudar determinados assuntos trabalhados por especialistas (não manuais de estudo), em casa ou no trabalho permitem a utilização de acordo com disponibilidade de trabalho e de tempo	valia para localizadas como Évora dada a interioridade é importante, desde que simples e concisa de fácil acesso são de fácil acesso são ferramentas de aprendizagem uteis disponíveis online é uma mais-valia porque podes aceder à plataforma em qualquer altura
Facilidade de acesso (aquisição de conhecimento):	Facilidade de acesso (aquisição de conhecimento):
forma de melhorar o conhecimento mais uma arma ao dispor para melhorar os nossos conhecimentos disponível atual excelente ajuda na prática clínica e na atualização de conhecimentos muito útil com aplicabilidade nas consultas de médico de família útil para as consultas de MGF muito importante na formação acho muito interessante e utilidade para lidar melhor com estas doenças e doentes muito uteis para atualização de conhecimentos e sua aplicação na prática clínica uma forma fácil e rápida de acesso a informação sintética e correta muito importante em termos de formação e melhoria da atividade clínica acho que são plataformas muito uteis para renovação e revisão de conhecimento completar os conhecimentos em áreas mais específicas, mas muito comuns nos cuidados de saúde primários fantástico é sempre bom para estar atualizado e ter uma ajuda mais próxima do especialista	boa "ferramenta" para conhecimento e atualização a plataforma permite ter acesso a informação atual necessária à prática diária é importante para atualização e melhor prescrição conhecimento disponível, credível e acessível, dois aspetos fundamentais para um acesso rápido com muita informação disponível considero uma mais-valia na aquisição e melhoria dos conhecimentos médicos penso que podem ser muito uteis pois permitem um acesso fácil a informação relevante plataformas que nos permitem esclarecer dúvidas, sendo uma mais-valia na prática clínica

Positivo t0	Positivo t12
disponibilidade de informação de confiança que ajuda à atualização de conhecimentos essenciais à prática clínica de qualidade do médico de família, com o objetivo de uma melhor abordagem e qualidade de cuidados prestados aos doentes	
Negativo t0	Negativo t12
Não exequível / não praticável:	Não exequível / não praticável:
a prescrição das BZDs é apenas uma pequena área das muitas que é suposto serem competência do MGF; há muitos programas em muitas áreas, cada vez mais e com o número de utentes que temos Não são exequíveis	muito interessante e importante, mas a existência de tantas plataformas e o tempo que nos resta em consulta não ajuda deverá ser acompanhada sempre que possível de "conversas" com a presença física de professores e alunos com a carga horária de trabalho que tenho em que a própria vida pessoal está muito alterada como arranjar tempo e motivação para mais? Sinceramente não é de forma alguma falta de interesse na área em teoria estão as atividades não assistenciais, mas ficam preenchidas por reuniões, prescrição de receitas
Questões técnicas:	Questões técnicas:
como barreira o acesso à informática	
fantástico, mas sempre na perspetiva prática do momento em que temos o doente à frente para ajudar nesses momentos	
	Formato:
	importante, mas a existência de tantas plataformas não respondem às necessidades no momento da consulta, quando estamos sensibilizados para o tema e com dúvidas na consulta sinceramente, não é de forma alguma falta de interesse na área considero bastante importante daí ser importante melhorar o acesso e a visualização dos conteúdos
Motivação:	Motivação:
a sua utilização invade o espaço familiar/pessoal se não cair no esquecimento	talvez precisássemos de maior motivação vontade para aceder às aulas

Negativo t0	Negativo t12
com algumas renitências	com a carga horária de trabalho que tenho em que a própria vida pessoal está muito alterada como arranjar tempo e motivação para mais
Tempo:	Tempo:
no espaço do centro de saúde não tenho tempo para aceder	tempo disponível o tempo que nos resta em consulta não ajuda devido às restantes exigências por parte do internato não me foi possível participar como gostaria são uteis assim haja tempo para as praticar havendo tempo com a carga horária de trabalho que tenho em que a própria vida pessoal está muito alterada como arranjar tempo e motivação para mais o problema por vezes é a falta de tempo penso que são úteis, mas seria preciso ter um tempo específico (para prática, não teoria)

Question 17 (Q17) – Perceptions over the feasibility of the ePrimaPrescribe platform

Positivo t0	Positivo t12
Aspetos técnicos:	Aspetos técnicos:
facilidade na acessibilidade	podia escolher o horário
metodologia	evita deslocações
rápido	adequação à disponibilidade
fácil acessibilidade	tempo
cada vez mais a acessibilidade é essencial	rapidez de acesso
facto de ser online é prático	facilidade
suporte informático disponível	acessibilidade
tenho material informático	disponível a qualquer hora
ganho de tempo	fácil acesso
maior flexibilidade para participar	fácil utilização
fácil contacto	globalmente disponível
+ privado contacto	flexibilidade de horário de acesso
já vamos estando ligados à informática	acessível
facilidade no acesso aos conteúdos do programa	rápido
facilidade de acesso	fácil acesso
acessível	disponíveis
flexibilidade de horário	tempo
formato a que aderem bem, sobretudo os mais jovens	possibilidade de adaptar à disponibilidade
fácil acesso	facilidade de utilização
vídeos curtos	fácil
programas curtos	sem custos
acesso a qualquer hora do dia;	facilidade no acesso
possibilidade de interromper momentaneamente a formação	menos tempo consumido na prática
se forem de fácil acesso	facilidade na utilização
rápido acesso	possibilidade de utilização recorrente
acesso rápido às fontes	a formação online é sempre uma mais-valia pela falta de tempo
maior sensibilidade de todos para as novas tecnologias de formação e receber informação	podes ouvir uma formação as vezes que seja necessário
facilidade de acesso	
facilidade de utilização	
facilidade de programação e disponibilização	
poder rever a informação quando precisa	

Positivo t0	Positivo t12
Facilidade de acesso (conhecimento):	Facilidade de acesso (conhecimento):
é importante estudos que nos ajudem a compreender os nossos erros	disponibilidade de formação em SOS
conhecimento teórico necessário	é mais uma modalidade de aprendizagem
tenho vontade experimentar	variedade de temas
melhorar conhecimento	atualização
temas específicos e interessantes clinicamente	atualização
melhoria de conhecimento	resposta
melhorar os conhecimentos	formação de forma rápida
interesse profissional	credibilidade
formação/atualização de conhecimentos	forma de aprendizagem utilizada muito frequentemente atualmente
fácil acesso à informação	apresentações simples
continuidade da formação médica	facilidade no acesso à informação
facilidade e continuidade ao acesso à formação	fácil leitura
conteúdo pertinente e sucinto	importância da formação contínua
aumentar o conhecimento	partilha de informação entre pares
melhoria da relação entre os cuidados de saúde primários e hospitalares	informação fonte fidedigna
necessidade de atualização constante em medicina	informação atualizada no momento de necessidade
ritmo de aprendizagem variável com o utilizador	falta de apoio interpares
se houver possibilidade de apoio do programa perante dificuldades	ausência de observação de benefícios
	é importante atualizar-se, fazer formação contínua
	aprofundar os conhecimentos
	interesse médico
	mais-valia para a prestação de cuidados
Conveniência:	Conveniência:
cómodo	comodidade
em termos de disponibilidade é talvez mais exequível	comodidade
possibilidade de articulação com disponibilidade	conveniência
maior flexibilidade para participar	formação de forma mais cómoda
possibilidade de suporte	podemos recorrer numa situação específica
útil	útil
fácil	se foi possível e útil nesta área também será possível noutra área
muito interessante	útil
utilidade	falta de tempo

Positivo t0	Positivo t12
	é importante a proposta destas plataformas
Melhoria da prática clínica:	
é sempre bom se melhorar a prática clínica melhorar o cuidado do paciente ajuda na prática clínica ferramenta útil para a prática clínica melhoria da atuação clínica melhorar saúde dos doentes	
Negativo t0	Negativo t12
Tempo:	Tempo:
com algum esforço pessoal em conseguir tempo para este efeito	com reorganização do tempo pessoal; com reorganização do tempo de exercício profissional/consultas
só preciso de tempo	limitação de tempo
sim, se estes programas e a sua utilização forem contabilizados como tempo de trabalho efetivo	tempo disponível
	falta de tempo
	tempo
Aspetos técnicos:	
incapacidade informática faltam meios	
Motivação:	Motivação:
pouca motivação para formação online	motivação

Question 19 (Q19) – Subjective awareness of the impact the utilization of the platform had in participant's BZD prescribing pattern

Positivo t0	Positivo t12
Conhecimento:	Conhecimento:
melhoria das ferramentas usadas	capacitação para descontinuação
melhorar os esquemas de <i>deprescribing</i>	aprendi a diagnosticar
maior à vontade na utilização de antidepressivos e BZDs	adequei a prescrição;
é fornecida por colega psiquiatra	informação da colega
qualidade da informação	transição de BZDs de curta para longa ação
acredito na qualidade da informação/conteúdo	perceção da utilização correta das BZD
atualização de conhecimentos	esquemas de desmame pré-definidos
mais conhecimento	informação clara
com mais conhecimento prescrevemos melhor	facultar informação e ferramentas que facilitam a alteração da prescrição
melhorando conhecimento, melhora-se comportamento	define estratégias na medicação
melhor segurança na descontinuação	aumentei um pouco os meus conhecimentos sobre BZDs, sobretudo no campo das semividas, o que permitiu fazer alterações e ajustes;
aquisição de novos conhecimento	melhorar o meu conhecimento sobre BZDs
maior segurança na utilização de BZDs	melhorar o meu conhecimento sobre S. Depressivo/ansiedade
atualização de conhecimentos	esclarecimento de algumas dúvidas
melhorar os conhecimentos de prescrição	ajudou em como fazer descontinuação de BZDs
articulação de cuidados	
informação	
atualização	
ajuda para desmame	
aprender estratégias para a alteração	
adequação a nível medicamentoso para diferentes patologias	
atualização no âmbito da saúde mental	
ajuda na prescrição adequada das benzodiazepinas	
atualiza conhecimentos	
fácil acesso a esquemas de desmame orientados	
disponibilização de argumentos	
indicações terapêuticas	
melhor informação	

Positivo t0	Positivo t12
esquemas simples de descontinuação lidar melhor com a prescrição de BZDs e antidepressivos saber fazer o desmame deste tipo de fármacos conhecer alternativas à prescrição de BZDs melhoria no manuseamento de BZDs (indicação e limitação) conhecimento de tx alternativos atualização de conhecimentos pode traduzir-se numa melhor prática de prescrição melhoria na minha formação aprender pôr em prática aquilo aprendido espero receber mais suporte teórico que não possuo à luz de novos conhecimentos provavelmente saberei manusear melhor esta classe farmacológica; provavelmente com mais conhecimento das patologias saberei escolher melhor interação CSP/cuidados hospitalares	
Regulação comportamental:	Regulação comportamental:
alerta para o abuso na prescrição de BZDs sublinha a importância de se fazer uma reflexão sobre os nossos hábitos de prescrição se não estou a fazer bem o meu trabalho claro que vou mudar; ficarei mais atento e consciencializado; compreender tenho consciência que é um problema de saúde pública	estou mais alerta para o abuso no consumo de BZDs já era muito criteriosa na prescrição reforçou apenas os meus procedimentos tento reduzir a prescrição de BZDs tento suspender o fármaco tento não iniciar este fármaco consciencialização/reflexão sobre a minha prescrição habitua maior alerta para a questão da sobreprescrição sensibilidade para o tema melhorar a minha prescrição de BZDs consciencialização do problema procuro alertar para o problema da dependência, logo no início
Motivação:	Motivação:
vontade em melhorar os cuidados prestados aos utentes	

Positivo t0	Positivo t12
acredito que seja capaz de mudar/melhorar quero prestar o melhor cuidado que me for possível motivação tenho a expectativa que possa vir a alterar o padrão de prescrição nalguns casos querer descontinuar a prescrição tenho muita motivação para esta problemática	
Aspetos técnicos:	Aspetos técnicos:
facilidade de acesso à informação a quem precisa quando precisa no tempo que precisa acessibilidade da plataforma (mesmo na USF)	facilidade de pôr em prática
Translação para a prática clínica:	
melhor prática melhoria na prescrição melhorar a prescrição melhorar na prescrição/terapêutica utilidade	
Negativo t0	Negativo t12
	a informação na plataforma ajusta-se à minha prática clínica não utilizei o suficiente utentes muito sintomáticos utentes não recetivos a alteração terapêutica não consegui acompanhar/terminar não acesso adequado à plataforma falta de disponibilidade também da minha parte também para o fazer não visualização dos vídeos

Question 22 (Q22) – Perspectives over the inclusion of mental health performance indicators

Positivo t0	
Benefícios da avaliação:	Benefícios da avaliação:
tem que haver avaliação	melhorar o conhecimento dos padrões de prescrição
parece-me pertinente existir indicadores positivos sobre ansiedade e depressão	melhor consciência do processo de prescrição
sensibilização para o abuso de ansiolíticos/benzodiazepinas	manter boa monitorização sobre a saúde mental dos doentes
monitorizar o uso de BZDs prescritas	poder fazer-se comparação entre USFs
efeitos nefastos da utilização prolongada das BZDs	um indicador bem estruturado ajuda a qualificar uma boa prática
maior precisão estado de saúde no tratamento	melhorar diagnóstico de situação, depressão
abordagem ao problema da ansiedade/depressão	permite saber se estamos a tratar bem os nossos utentes
evitar o abuso de medicação antidepressiva e ansiolítica	razões porque abandonam o tratamento
evitar o uso de BZDs sem necessidade	subavaliados
evitar dependência de BZDs	dificuldade em alguns diagnósticos
falta de exequibilidade	sensibilizar os próprios profissionais
pouca informação no dia-a-dia	mudar o panorama de Portugal como grande consumidor de BZDs
indicadores causa-efeito	adequar indicadores à realidade
para melhor adaptação da medicação ao doente	diminuição da qualidade de vida e aumento do absentismo laboral
para melhorar indicadores saúde mental a nível nacional	sensibilização dos profissionais
melhorar os cuidados prestados	análise dos dados de prescrição
melhor adequação das prescrições às patologias	chamaria mais a atenção dos profissionais para as boas práticas nesta área
evicção da dependência	motivação dos profissionais para as boas práticas
faltam indicadores relativos a: grau de satisfação do utente com a terapêutica	é necessário perceber melhor porque é que tanta gente está a tomar BZDs
motivar os médicos a tratar adequadamente estas patologias	esclarecimento da depressão
para saber se estamos a melhorar	aumento da prescrição
ajudaria reavaliar estes doentes	para dar mais relevância à doença mental
faria com que a classe médica olhasse de outra forma para a abordagem destes doentes	para ter melhores resultados em saúde
	alertar os médicos para a importância destes problemas

Positivo t0	
	avaliação do seguimento regular cumprimento terapêutico podem, se bem contruídos, motivar a aquisição de conhecimentos indicadores expressados por outra medida era importante também na urgência fazer entender aos colegas que não podem usar tantas BZDs difícil desprescrição pela utilização durante anos satisfação com o tratamento do doente melhoria clínica estabilidade clínica
Epidemiologia de Saúde Mental:	Epidemiología de Saúde Mental:
temos muitos doentes com esta patologia	problema de saúde com prevalência elevada
são patologias com impacto na saúde	para conhecer melhor o risco de doença;
prevalência das patologias	patologias ainda muito negligenciadas
incidência	doenças com incidência/prevalência elevada e crescente
melhorar a saúde/ promoção da saúde global nos cuidados primários	"epidemia" a par da hipertensão e diabetes que terá de ser valorizada
problemas de saúde muito prevalentes	importância da saúde mental
grande quantidade de utentes com ansiedade e depressão	grande número de doentes com problemas de saúde mental
grande impacto que estas patologias têm na vida dos utentes	observação de outras patologias
a área da saúde mental é muito importante	a prevalência de consumo de BZDs em idosos é altíssima
as perturbações da saúde mental são muito prevalentes e surgem em todas as idades	a depressão e ansiedade têm alta prevalência nos idosos
fazer estudos nacionais	falta de indicadores que nos indiquem o estado geral da saúde mental na região
Resource accounting:	Resource accounting:
temos pouco tempo para eles	subavaliados
conhecimento deficitário	melhor qualidade da prestação de serviços
pouca sensibilidade	melhorar a qualidade de vida para doente mental
aumento do apoio de outros profissionais como psicólogos	indicadores bem estruturados são uma mais-valia
avaliação do n.º de tentativas promovidas pelo médico para parar a terapêutica	tempo de resposta quando o doente é referenciado
perturbação de saúde mental traduz em grande sobrecarga	para se marcarem mais consultas de seguimento

Negativo t0	Negativo t12
não considero que os indicadores sejam uma boa forma de monitorização	considero que a prestação de cuidados com base em indicadores consome e desvirtua o tempo que devíamos dedicar aos utentes
podem ser subvertidos	já há indicadores a mais
dar-se mais atenção aos indicadores relativamente ao utente em particular	sobrecarga de indicadores já existentes
são muito redutores	excesso de plataformas informáticas
indicadores a mais	uma boa prática clínica não implica necessariamente a utilização de indicadores
patologia complexa para monitorizar	não nos podemos focar só na saúde mental
por falta de tempo nas consultas	demasiados utentes e pouco tempo para consulta
com todo o trabalho que temos é impossível	a relação médico-doente vai-se com tantos indicadores
uma boa prática não depende de indicadores	área com elevado grau de subjetividade, que não deverá ser reduzida a números
os indicadores nem sempre traduzem realidade	já somos avaliados por demasiados indicadores
penso que não é fácil monitorizar a saúde mental com números e percentagens	mais programas informáticos
o indicador não reflete a atividade do MGF	mais burocracia
sem formação na área não faz sentido	mais registos informáticos?
sem melhoria da resposta da consulta de psicologia, em tempo útil, não faz sentido	indicadores estritamente económicos não favorecem os doentes
excesso de indicadores	
já há muitos indicadores	
em situações agudas usa-se BZDs mas uma prescrição contabiliza para indicador	
considero que a terapêutica é muito pessoal/utente e sempre para o benefício do utente	
os indicadores existentes são muito economicistas	

Question 23 (Q23) – Performance indicators that participants would consider beneficial to implement, hence specific and practical solutions to change BZD prescription and (in general) the management of mental health disorders in primary health care settings

Avaliação da prescrição t0	Avaliação da prescrição t12
se tomam mais de uma BZD	tempo de utilização/uso medicamentoso
avaliação do tempo de tratamento	% de prescrição de antidepressivos
diagnóstico de ansiedade/tratamento	principais antidepressivos prescritos
duração do tratamento com BZDs	principais ansiolíticos prescritos
duração do tratamento com antidepressivos	utilização de antidepressivos nos doentes com diagnóstico
duração do tratamento com BZDs na insónia	nº de caixas prescritas
duração do tratamento com BZDs na ansiedade	tipo de benzodiazepinas prescritas
prescrição de benzodiazepinas	nº de primeiras prescrições
prescrição de antidepressivos	nº de interrupções de tratamento
principais antidepressivos usados	monitorização da aplicação de escalas de depressão ao diagnóstico e para monitorização da terapêutica
% de utilizadores com prescrição de BZDs (independente da idade)	monitorização de desmame de benzodiazepinas
% de utilizadores com prescrição de antidepressivos	% de antidepressivos prescritos
% de utilizadores de BZDs independentemente da idade	mais controlo terapêutico
monitorização da prescrição de antidepressivos;	quem passou pela 1.ª vez a BZD?
monitorização de novas prescrições de BZDs	
relação entre o tempo de prescrição e a melhoria da sintomatologia	
avaliação do nº de tentativas promovidas pelo médico para parar a terapêutica	
prescrição de BZDs	
um indicador que controle ser medicação crónica independente que controle a prescrição aguda	
relação entre medicação crónica e aguda	
relação BZDs/antidepressivos	

Avaliação do diagnóstico t0	Avaliação do diagnóstico t12
n.º de utentes com depressão crónica	% de doentes com depressão
parâmetros semestrais (ex.: escala de depressão pontuação nos dois semestres)	indicador para "humor e anedonia"/escalas
escalas validadas	preenchimento de escalas incluídas no SClínico
evolução dos diagnósticos	comparação com a % de diagnóstico em USFs e a nível nacional
diagnóstico de depressão	monitorização da aplicação de escalas de depressão ao diagnóstico e para monitorização da terapêutica
sintomas	estado socioeconómico das famílias; disfunção familiar – utilização de instrumentos de avaliação
escalas de avaliação de sintomas	% de doentes deprimidos medicados
	escalas de avaliação de sintomas e evolução ao longo do tempo
	avaliação dos dois primeiros meses após o diagnóstico de ansiedade e depressão

Monitorização do estado clínico/severidade t0	Monitorização do estado clínico/severidade t12
indicadores do negativismo do estado psicológico	estado socioeconómico das famílias
indicadores de estados emotivos	melhoria clínica
pirâmide etária	estabilidade clínica
indicadores de melhoria	

Utilização de recursos t0	Utilização de recursos t12
tratamento psicológico em utentes com depressão e ansiedade	mais resposta de psicoterapia
n.º de consultas programadas	pelo menos duas consultas por paciente
n.º de consultas de urgência com diagnóstico de depressão e ansiedade	número de consultas durante 1 ano
consulta de psiquiatria anterior	encaminhamento adequado para os cuidados hospitalares
n.º de internamentos	tempo médio de espera para primeira consulta de psiquiatria
existir na USF equipas multidisciplinares ou técnicos de saúde mental e social disponíveis para melhorar os cuidados aos utentes com problemas de saúde mental	tempo médio de espera para consulta de psicologia
	n.º de consultas por ano (pelo menos mais uma ou duas)
	n.º de referências para psicologia (que devia ser alto)
	n.º de consultas anual
	x utentes encaminhados para psicoterapia

Utilização de recursos t0	Utilização de recursos t12
	tempo consumido no doente com codificação p74/P76 do ICPC2 comparativamente ao usado para outras patologias
	x utentes com pelo menos 2 consultas por ano nos que têm codificado P74 ou P76 do ICPC na lista de problemas
	seguimento destas pessoas em consulta pelo menos 1x por ano
	apoio psicológico
	tempo de consulta para utentes com ansiedade/depressão; consulta de psicologia para utentes com ansiedade/depressão
	n.º de consultas de seguimento
	referenciação aos cuidados hospitalares
	consultas de psicologia
Satisfação dos utentes t0	Satisfação dos utentes t12
grau de satisfação do utente com a terapêutica	satisfação com o tratamento do doente

Additional file 12. Grid analysis of in-depth semi-structured interview.

Problemáticas/tópicos	Dimensões/state of the art	Perguntas	Informação pretendida
		Como sabe o meu doutoramento versou sobre a problemática da prescrição excessiva de BZDs, propondo uma plataforma online para auxiliar a mudança do padrão de prescrição destes fármacos. Antes de abordarmos questões mais específicas, gostaria de lhe perguntar que sentido lhe fez participar neste estudo?	
Práticas e atitudes quanto à prescrição de BZDs e ao cuidado da saúde mental nos CSP			
		a) De que forma a problemática da prescrição continuada se coloca na sua prática clínica? Ou acha que este já foi um problema mais grave? Tem havido mudanças?	<i>Perspective over the amount of BZD that are prescribed (predictions)</i>
Perfil do utente a quem é prescrita BZD O início da prescrição de uma BZD ser considerada uma necessidade para o alívio imediato ou pelo menos mais rápido da sintomatologia Perfil do utente a quem é mantida a prescrição de BZD	<i>GPs feel overwhelmed by the psychosocial problems of their patients. They show empathy by prescribing. They feel in certain situations there are no other solutions and they experience BZDs as the lesser evil. They admit to resorting to BZDs because of time restraint and lack of alternatives. GPs do not perceive the addictive nature of BZD consumption as a problem with first-time users. GPs do not specifically mention patients' demand as an element for starting (1)</i>	b) Por exemplo, no seu caso, qual a sua perspetiva sobre a quantidade de utentes a quem prescreve estes fármacos? Sente que já teve mais utentes a fazer este tipo de medicação? Ou continua a ter muitos utentes (a fazer este tipo de medicação)? Que tipo de perfis identifica nos utentes a quem prescreve BZDs? Quais as razões que o levam a iniciar uma BZD a um utente? Vê diferenças em relação aos utentes a quem mantém esta prescrição durante mais tempo?	<i>b) reasons for prescription</i> <i>i.reasons for initiating BZDs</i> <i>ii.reasons for BZD long-term prescription</i> Coincidência com perfil descrito noutros estudos; melhor definição do doente “merecedor” desta prescrição (problemáticas com as quais a maior empatia/identificação do médico leva à prescrição para o rápido alívio das queixas)

Problemáticas/tópicos	Dimensões/state of the art	Perguntas	Informação pretendida
			Compreender se há uma desvalorização do fenómeno de adição e tolerância nas situações de primeira prescrição
			Comparar com resultados de estudo qualitativo
			Desejabilidade social
Aplicação de critérios diagnósticos para perturbação depressiva e ansiosa na prática clínica diária	<i>Sixty percent acknowledged difficulties motivating patients to stop taking BZDs, yet only 56% believed they knew how to manage a patient's withdrawal from BZDs (2)</i>	c) Considera que pode existir um desfasamento entre o conhecimento teórico e a prática clínica, quanto às BZDs? Ou seja, acha que as guidelines podem de alguma forma estar desfasadas da realidade que experiencia na sua prática clínica? Por exemplo, quanto aos critérios diagnósticos que indicam a necessidade de prescrição de BZDs e antidepressivos, ou a necessidade de descontinuação...	1. b. <i>perspectives concerning guidelines in clinical practice</i>
Distância/diferença/gap entre conhecimento teórico e prática clínica			Knowledge – (lack of) familiarity
			Attitudes – Outcome expectancy
Utilização da NOC ansiedade e utilização de BZDs		d) (Ainda em relação a normas e guidelines de atuação nesta problemática da prescrição de BZDs), Conhece provavelmente a Norma de Orientação Clínica (NOC) da DGS para Abordagem Terapêutica da Ansiedade e Insónia, e a NOC para Tratamento Sintomático da Ansiedade e Insónia com Benzodiazepinas e Fármacos Análogos? Considera que são úteis no seu dia a dia de prática clínica? Acha que essas NOC precisariam ser alteradas? Se sim, em que medida?	1. b. <i>perspectives concerning guidelines in clinical practice</i>
			Knowledge – (lack of) familiarity

Problemáticas/tópicos	Dimensões/state of the art	Perguntas	Informação pretendida
Pergunta geral para abordagem inicial à identificação de barreiras	<i>Physicians cited time constraints as both promoting benzodiazepine use and impeding discontinuation efforts. A benzodiazepine becomes a quick fix because you don't have time, this is what they want, they don't feel good, here it is. It numbs them up and you're not gonna get a phone call afterwards, you're not gonna get anything, you'll see them in a month, here's your renewal, see ya later" (3)</i>	e) Quais as principais barreiras que identifica à alteração do padrão de prescrição e consequente descontinuação de BZDs? Por outro lado, em que situações vê benefícios em continuar o tratamento durante mais tempo? Quanto a fatores externos: Tempo de consulta; Falta de psicólogos; Escassez de recursos materiais (ex: panfletos informativos para os utentes sobre problemática do uso excessivo de BZDs); Resistência do doente a outras alternativas? Crença e atitudes dos doentes como barreira	2. c. <i>perspectives over psychopharmacopharmaceuticalization</i> 2. d. <i>reported difficulties in prescription/medication</i> 2. e. <i>intervention context/ healthcare provision/ Opportunity (physical) – Environmental context and resources/organizational context of primary health care settings</i> i. <i>barriers – high demand related to high prevalence of mental; time management; (pitfalls)</i> 2. f. <i>opportunity social/social influences.</i> i. <i>barriers – patient's barriers to prescription change; ageing; living conditions; doctor-patient relation; demand by patients</i>
Fatores externos			Behaviour – External Barriers (environmental factors) 2. c. <i>perspectives over psychopharmacopharmaceuticalization</i> 2. d. <i>reported difficulties in prescription/medication</i> 2. e. <i>intervention context/ healthcare provision/ Opportunity (physical) – Environmental context and resources/organizational context of primary health care settings</i>
Renovação de prescrição iniciada por outros médicos	O facto dos MGFs serem pressionados para a observação e gestão de doença mental leve a moderada que anteriormente estava nos cuidados de saúde secundários (4,5).	f) Sabemos que um número elevado de utentes procura os CSP com queixas de ansiedade e depressão. De que forma este dado constitui uma pressão acrescida para a prescrição de BZDs? Por exemplo, sente que há pressão por parte dos utentes para iniciarem terapêutica com BZDs (portanto primeiras prescrições)? Quando a prescrição de BZDs é iniciada por outro médico, sente que há uma maior pressão dos utentes para a	
Dificuldade em recusar a prescrição realizada por outros médicos (especialistas)			

Problemáticas/tópicos	Dimensões/state of the art	Perguntas	Informação pretendida
	<i>GPs do not specifically mention patients' demand as an element for starting (1).</i> <i>Asking about how they feel about their authonomy, concerning the fact that they are pressured by their patients to prescribe what specialists introduced;</i> <i>(Se é um especialista a prescrever, se se sentem...) empowered to say they know more about BZDs and to refuse prescription.</i>	continuidade dessa prescrição? E qual a sua opção nessa situação (de prescrição iniciada por outro médico) - Mantém a prescrição? (tentar perceber se há atitude diferente caso seja iniciada na urgência ou por especialista)	<i>i. barriers – high demand related to high prevalence of mental; time management; (pitfalls)</i> <i>2. f. opportunity social/social influences</i> <i>i. barriers – patient's barriers to prescription change; ageing; living conditions; doctor-patient relation; demand by patients</i>
	To some extent, primary care physicians may be influenced by specialists to prescribe drugs they would have otherwise not choose (6).		Problemática da movimentação de processos de reposicionamento entre a especialidade de psiquiatria e MGF em torno das problemáticas de saúde mental.
	Some studies show that specialists are more often earlier adopters, initiating treatments with a new drug, which family physicians then continue.92-94 When specialists initiate treatment with a different drug, family physicians might		Behaviour – External Barriers (patients factors) – Identificação de barreiras dos utentes na perspetiva dos médicos (Importância de discutir com o doente as suas expectativas quanto ao início, continuação e descontinuação do tratamento, com explicação das vantagens e desvantagens – impacto da empatia e expectativas subentendidas na tomada de decisão – <i>decision making</i>)
			Attitudes – Motivation Inertia of previous practice Razões para a manutenção/renovação de prescrições. Particularmente explorar se as razões dessa manutenção são as

Problemáticas/tópicos	Dimensões/state of the art	Perguntas	Informação pretendida
	feel compelled to keep it, feel they do not have all the information needed to recommend a different treatment or patients might be resistant to change (6).		mesmas para prescrições “corretas” e “incorretas”; perceber se razões relacionadas com barreiras (ao nível) do paciente exploradas no início da questão
Doentes como barreiras à alteração da prescrição	<i>GPs do not specifically mention patients' demand as an element for starting (1).</i> <i>Asking about how they feel about their autonomy, concerning the fact that they are pressured by their patients to prescribe what specialists introduced;</i> <i>(Se é um especialista a prescrever, se se sentem...) empowered to say they know more about BZDs and to refuse prescription</i>	g) Acha que de algum modo a relação médico-doente é prejudicada quanto nega a prescrição ou tenta suspender a prescrição de BZDs? Como gere estas situações em consulta?	Gestão destas barreiras para levar à mudança de atitude e aceitação da suspensão
Influência na atitude pessoal do MGF se ele próprio for utilizador de BZDs	(1,5)	h) Na sua prática clínica, propõe outras intervenções terapêuticas, para além da medicamentosa, em situações de ansiedade e depressão? Ou seja, acha que existem alternativas às	Solutions

Problemáticas/tópicos	Dimensões/state of the art	Perguntas	Informação pretendida
Perceção da inexistência de outras opções terapêuticas (sobretudo em casos que impliquem problemáticas de natureza psicossocial)	<i>Estudo referidos demonstram que se os próprios médicos forem utilizadores haverá maior prescrição</i> (5,7)	benzodiazepinas? Com a mesma eficácia? Quais? Se sim, quais? (competências de comunicação? Intervenção psicológica não estruturada? Porquê? Se não, porquê?	Atitudes – Self-efficacy Perceber se atitude (pessoal) do médico em relação às BZDs influencia a facilidade com que prescrevem Atitudes – Outcome expectancy Behaviour – External Barriers (environmental factors) – se referencia a falta de psicólogos
Perceção sobre a pertinência/adequação da gestão/tratamento de pessoas com doença mental leve/moderada, nomeadamente ansiedade e depressão em contexto de cuidados de saúde primários	<i>Sixty percent acknowledged difficulties motivating patients to stop taking BZDs, yet only 56% believed they knew how to manage a patient's withdrawal from BZDs (2).</i>	i) Todas as reflexões anteriores têm como questão de fundo o sistema de cuidados de saúde mental. Gostaria que me falasse da sua experiência no cuidado a pessoas com queixas de doença mental leve a moderada nos CSP. Considera que as problemáticas de saúde mental leves a moderadas podem ser tratadas/cuidadas em CSP? Ou deveriam ser tratadas em locais de especialidade e por especialistas? Acha que atualmente se medica demais situações de sofrimento psicológico?	<i>Barriers</i> <i>Solutions</i> <i>Facilitators</i>
Perspetiva de subdiagnóstico da ansiedade/depressão (questão ainda para refletir e considerar pertinência da sua inclusão)		j) Que recursos acha que o ajudariam, no seu dia-a-dia, a lidar com problemáticas de saúde mental? Acha que ajudaria ter ao seu dispor escalas ou algoritmos que o ajudassem na realização do diagnóstico para depressão e ansiedade?	<i>Solutions</i> <i>Facilitators</i> Knowledge – (lack of) familiarity <i>ou</i> Atitudes – Self-efficacy
Identificação de recursos prioritários para a solução das problemática da gestão da pessoa com doença mental nos CSP			
Aplicação de critérios diagnósticos para perturbação depressiva e ansiosa na prática clínica diária			

Problemáticas/tópicos	Dimensões/state of the art	Perguntas	Informação pretendida
(questão ainda para refletir e considerar pertinência da sua inclusão)			
Barreiras e facilitadores à implementação de DBCI e (em certa medida) à formação médica continuada			
Formação sobre gestão da pessoa com doença mental no <i>setting</i> dos cuidados de saúde primários	<i>None of those interviewed saw a need to review their approach to prescribing for elderly patients or for additional medical education (7).</i> (1,5)	k) Da fase inicial de participação no estudo percebi que não teria/teria formação específica em saúde mental (Caso não tenha feito), gostaria de ter tido essa oportunidade? Que tipo de formação? (Caso tenha feito), acha que foi suficiente? Gostaria que a sua formação tivesse sido diferente? Em que aspetos? a) Sabemos que a formação médica continua é necessária. Como é para si a forma mais eficaz de se manter atualizado? Acha que é necessário haver formações periódicas, formais, ou bastaria a curiosidade/sensação de necessidade do médico?	1.a. <i>perspectives concerning training in mental health</i> Identificação de barreiras especificamente na área da saúde mental Knowledge – (lack of) familiarity 1.d. <i>Solutions</i> 1.e. <i>Facilitators</i>
Barreiras à formação contínua	No trabalho realizado verificou-se que a utilização da plataforma foi semelhante no grupo de controlo e no grupo de intervenção, apesar do tema da plataforma de intervenção ser à partida muito mais interessante e com aplicação clínica prática e útil. Que	b) De uma forma mais geral, que barreiras identifica à formação contínua dos médicos de família? Que fatores influenciam mais a decisão de fazer formação? Os conteúdos? A avaliação das necessidades? A definição das prioridades pelos Centros de Saúde?	Barreiras gerais à formação contínua dos médicos; Especificamente em relação ao trabalho desenvolvido tentar perceber porque é que a utilização da plataforma foi semelhante em ambos os grupos. Porque em ambos não há

Problemáticas/tópicos	Dimensões/state of the art	Perguntas	Informação pretendida
	razões consegue apontar para este facto?		interesse/capacidade/outras para a utilização de uma plataforma online (problemática da forma como a formação é apresentada)? Porque ambas trataram um tema de saúde mental (problemática relativa ao conteúdo)?
Utilização de tecnologia para educação médica no <i>setting</i> dos cuidados de saúde primários		c) Já utilizou plataformas online para formação médica? O que pensa da utilidade destas ferramentas? Para que tipo de formação/educação? O que gostou/não gostou? Se não usou, porquê?	1.f. <i>DBCI online platforms</i> i. <i>Barreirs to implementation of DBCI online platforms</i> ii. <i>Facilitators to implementation of DBCI online platforms</i> iii. <i>Solutions to implementation of DBCI online platforms</i>
Crença na capacidade de integrar na formação clínica contínua a utilização regular de ferramentas de formação <i>online</i>		d) Acha que as novas tecnologias são uma boa ferramenta para a formação médica? Como? E para as necessidades específicas de formação contínua dos médicos de família? O que o faria usar uma plataforma online com fins formativos (fatores facilitadores)? Se não, porquê?	Knowledge – (lack of) familiarity 1.f. <i>DBCI online platforms</i> i. <i>Barreirs to implementation of DBCI online platforms</i> ii. <i>Facilitators to implementation of DBCI online platforms</i> iii. <i>Solutions to implementation of DBCI online platforms</i>
Fatores influenciadores da utilização de ferramentas de formação <i>online</i>			
Barreiras externas à utilização de ferramentas <i>online</i> para formação médica		e) Identifica algumas dificuldades na utilização de ferramentas <i>online</i> na formação clínica contínua? E na prática clínica diária?	Attitudes – Self-efficacy 1.f. <i>DBCI online platforms</i> i. <i>Barreirs to implementation of DBCI online platforms</i>
Crença na capacidade de integrar na formação clínica contínua a utilização			

Problemáticas/tópicos	Dimensões/state of the art	Perguntas	Informação pretendida
regular de ferramentas de formação <i>online</i>		Acha que seria capaz de usar com regularidade? <i>Self-efficacy</i>	Behaviour – External Barriers (patients' factors, online platform factors, environmental factors)
Influência da pratica habitual/comum na integração da utilização de ferramentas de formação <i>online</i>		Acha que teria dificuldade em abandonar praticas anteriores?	Attitudes – Self-efficacy
		Acha que teria motivação para essa utilização?	Attitudes – Motivation Inertia of previous practice
			Attitudes – Motivation Inertia of previous practice
Fatores influenciadores da utilização da plataforma ePrimaprescribe		f) Especificamente em relação à plataforma ePrimaprescribe que fatores, na sua opinião facilitaram e dificultaram a sua utilização? De que forma o facto de tratar um tema de saúde mental poderá ter influenciado a sua utilização?	1.f. <i>DBCI online platforms</i> i. <i>Barreirs to implementation of DBCI online platforms</i> ii. <i>Facilitators to implementation of DBCI online platforms</i> iii. <i>Solutions to implementation of DBCI online platforms</i>
		g) Se tivesse de delinear uma formação abordando a alteração do padrão de prescrição de BZDs, o que acha que seria fundamental essa formação ter? Quem seriam os profissionais habilitados a dar essa formação? Seria mais prática mais teórica? Na área da psicopatologia ou da farmacologia? Presencial ou à distância?	1. c. <i>Barriers (subcategorias a identificar)</i> 1. d. <i>Facilitators (subcategorias a identificar)</i> 1. e. <i>Solutions (Esta secção de soluções não sei se fará sentido estar apenas integrada no primeiro artigo ou também estar referida no terceiro (especificamente dedicado a soluções). Tendo em conta que o terceiro artigo seria focado na alteração do padrão de prescrição, quanto muito referir</i>

Problemáticas/tópicos	Dimensões/state of the art	Perguntas	Informação pretendida
			brevemente a formação online como uma possível solução?) i. “solutions concerning service organization” ii. “solutions concerning intervention context” iii. solutions for training unmet need
Soluções alternativas ao uso das benzodiazepinas			
Soluções para a melhoria do cuidado e tratamento da pessoa com doença mental nos CSP		a) Melhoria do cuidado e tratamento das pessoas com doença mental nos CSP Recursos – físicos; Organizacionais – acha que teria de haver uma mudança na organização dos serviços? Humanos	3. Solutions to change BZD prescription pattern (subcategorias a definir; procurar reunir elementos das duas categorias identificadas acima, no sentido de elaborar artigo especificamente dedicado à abordagem das soluções sugeridas pelos médicos de família enquanto principais intervenientes e responsáveis pela prescrição de benzodiazepinas).
Solução para a descontinuação da prescrição de BZDs	<i>Less than half of all consultations (44%) were Straightforward (S) in type, another third (32%) were Psychosocial (P), and the remaining quarter (24%) were Complex (C). It should be noted that the P and C categories were not mutually exclusive: Psychosocial includes a few consultations which were Complex as well (...) P and C consultations took significantly longer (on average by 4 minutes) than S consultations (8).</i>	b) Alteração do padrão de prescrição de BZDs nos CSP Recursos – físicos; organizacionais; humanos; Intervenções com impacto significativo e duradouro – médicos? Utentes? Médicos+utentes? Comunidade? Meios de comunicação? Indicadores para a saúde mental? Que tipo de indicadores? (exemplo % de utentes com diagnóstico de depressão medicados com antidepressivos)	2.e.3. Solutions

Problemáticas/tópicos	Dimensões/ <i>state of the art</i>	Perguntas	Informação pretendida
		Tempo de consulta (períodos de consulta específicos e com consultas com tempos mais prolongados que os típicos 15min) Utentes – motivação para a descontinuação – intervenções envolvendo os utentes Psicoterapia/psicólogos Articulação com psiquiatria	
		Agora que chegámos ao final da entrevista e que já está em condições de ter uma visão global do que se pretende com esta investigação, tem mais alguma informação/tema/problemática que queira partilhar e que ache útil para este trabalho?	

Additional file 13. Characteristics of onsite questionnaire responders.

Characteristics	Used ePrimaPrescribe online platform		Didn't use ePrimaPrescribe online platform	
	USF	UCSP	USF	UCSP
Female, n (%)	15 (62.5)	3 (12.5)	3 (12.5)	3 (12.5)
Male, n (%)	4 (30.8)	3 (12.5)	5 (38.5)	1 (7.7)
Age				
n	19	6	8	4
mean	49.7	56.5	47.4	55.8
SD (min, max)	13 (30, 67)	10.1 (39, 65)	16.54 (28, 66)	8.66 (44, 64)
Years of clinical experience				
n	19	6	8	4
mean	23.1	27.83	20.75	29.75
SD (min, max)	12.48 (3, 40)	11.36 (8, 40)	15.8 (3, 39)	8.1 (19, 38)
Training in mental health				
Yes, n (relative %)	10 (47.6)	4 (19)	5 (23.8)	2 (9.5)
No, n (relative %)	9 (56.3)	2 (12.5)	3 (18.8)	2 (12.5)

Additional file 14. Characteristics of BaFAI responders.

	Control		Intervention	
	USF	UCSP	USF	UCSP
Female, n (%)	6 (46)	0 (0)	16 (89)	3 (50)
Male, n (%)	7 (54)	4 (100)	2 (11)	3 (50)
Age				
n	13	4	18	6
mean	46.8	54.5	50.22	56.5
SD (min, max)	11.75 (34, 63)	12.71 (43, 76)	11.57 (32, 67)	10.07 (39, 65)
Years of clinical experience				
n	13	4	18	6
mean	19.15	28.5	23.5	27.83
SD (min, max)	12.18 (7, 38)	11.56 (18, 39)	10.93 (5, 40)	11.35 (8, 40)
Training in mental health				
Yes, n (%)	8 (62)	2 (50)	7 (39)	4 (67)
No, n (%)	5 (38)	2 (50)	11 (61)	2 (33)

Additional file 15. Characteristics of interview responders.

Characteristics of primary health care doctors	n (%)
Type of primary health care unit	
USF	7 (58)
UCSP	5 (42)
Specific training in mental health	
Yes	6 (50)
No	6 (50)
Gender	
Female	5 (42)
Male	7 (58)
Usage of ePrimaPrescribe	
Yes	7 (58)
No	5 (42)
Age	
mean	54.25
SD	14.88
(min, max)	(30, 67)
Years of clinical practice	
mean	26.8
SD	14.56
(min, max)	(5, 40)

Additional file 16. Characteristics of onsite questionnaire responders.

Characteristics	Used ePrimaPrescribe online platform		Didn't use ePrimaPrescribe online platform	
	USF	UCSP	USF	UCSP
Female, n (%)	15 (62.5)	3 (12.5)	3 (12.5)	3 (12.5)
Male, n (%)	4 (30.8)	3 (12.5)	5 (38.5)	1 (7.7)
Age				
n	19	6	8	4
mean	49.7	56.5	47.4	55.8
SD (min, max)	13 (30, 67)	10.1 (39, 65)	16.54 (28, 66)	8.66 (44, 64)
Years of clinical experience				
n	19	6	8	4
mean	23.1	27.83	20.75	29.75
SD (min, max)	12.48 (3, 40)	11.36 (8, 40)	15.8 (3, 39)	8.1 (19, 38)
Training in mental health				
Yes, n (%)	10 (47.6)	4 (19)	5 (23.8)	2 (9.5)
No, n (%)	9 (56.3)	2 (12.5)	3 (18.8)	2 (12.5)

Additional file 17. Characteristics of interview responders.

Characteristics of primary health care doctors	n (%)
Type of primary health care unit	
USF	7 (58)
UCSP	5 (42)
Specific training in mental health	
Yes	6 (50)
No	6 (50)
Gender	
Female	5 (42)
Male	7 (58)
Usage of ePrimaPrescribe	
Yes	7 (58)
No	5 (42)
Age	
mean	54.25
SD	14.88
(min, max)	(30, 67)
Years of clinical practice	
mean	26.8
SD	14.56
(min, max)	(5, 40)

