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Health literacy among the new wave of migrants from the MENAP region in the metropolitan area of Lisbon

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Dissertation presented to fulfill the requirements necessary to obtain the master's degree in Public health, carried out under the scientific guidance of Professor Sonia Dias and Doctor Ana Gama

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Dedication

I would like to dedicate this work to the souls of my father and mother, Ayman and Etedal, who left this world but have never left my heart, and whose words of encouragement and push for tenacity never left my mind. I hope you both are proud of me.

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Resumo

A literacia em saúde refere-se às capacidades e recursos necessários para aceder, compreender e usar as informações de saúde na gestão da saúde. A literacia em saúde é um fator determinante da saúde que pode ser modificado para reduzir as disparidades e melhorar a equidade na saúde, especialmente entre grupos vulneráveis, onde se incluem migrantes devido aos efeitos cumulativos do processo migratório, das condições de vida e outros fatores existentes. A investigação sobre a literacia em saúde em Portugal ainda é escassa, especialmente sobre a literacia em saúde de populações migrantes. O objetivo deste estudo foi examinar os níveis de literacia em saúde de uma população de migrantes recentes da região do Médio Oriente, Norte da África, Afeganistão e Paquistão (MENAP) na área metropolitana de Lisboa, e explorar a relação entre literacia em saúde e as características sociodemográficas desta população.

Realizou-se um estudo quantitativo, transversal, descritivo e analítico. Os dados foram recolhidos de 86 migrantes da região MENAP através da aplicação do questionário de literacia em saúde por meio de entrevistas e plataformas online. Dados sociodemográficos também foram recolhidos. Os dados foram analisados por meio de estatística descritiva. Os tamanhos de efeito para diferenças nas médias foram calculados para determinar a magnitude das diferenças entre os grupos sociodemográficos.

Pontuações médias mais altas foram observadas para as escalas 'Apoio social para a saúde' e 'Compreensão das informações de saúde', pontuações médias mais baixas foram observadas para 'Sentir-se compreendido e apoiado por profissionais de saúde' e 'Navegar no sistema de saúde'. Foram observadas associações entre pontuações mais baixas em várias escalas e características sociodemográficas, como menor tempo de residência em Portugal, composição familiar, menor proficiência em português e a situação irregular de migração.

O estudo mostrou que os migrantes da região MENAP têm dificuldade em navegar no sistema de saúde português e nas suas relações com os prestadores de cuidados de saúde. Verificou-se que migrantes recentes, aqueles que não vivem com as suas famílias próximas, migrantes sem situação regularizada e aqueles com menor proficiência em português têm menor nível de literacia em saúde. Estes resultados fornecem uma visão sobre os recursos, lacunas e dificuldades em literacia em saúde dos migrantes da região MENAP em Lisboa e fornecem orientação para intervenções em saúde mais equitativas.

Palavras-chave:

Literacia em saúde, migração, migrantes da região MENAP

Abstract

Health literacy refers to one's abilities and resources required to access, understand, and use health information in managing health. Health literacy is a key determinant of health that can be modified to reduce health disparities and improve health equity, especially among vulnerable groups such as migrant communities due to the cumulative effects of other life conditions and existed factors. Research on health literacy in Portugal is still scarce, especially research on migrant's health literacy. The aim of this study was to examine health literacy levels in a population of the new wave of migrants from the Middle East, North Africa, Afghanistan, and Pakistan (MENAP) region in the metropolitan area of Lisbon, and to explore the relationship between health literacy and socio-demographic characteristics of this population.

The study was of a quantitative nature with a descriptive cross-sectional and analytical design. Data were collected from 86 migrants from the MENAP region using the health literacy questionnaire through interviews and online platforms. Socio-demographic data were also collected. Data were analyzed using descriptive statistics. Effect sizes (ES) for differences in means were calculated to determine the magnitude of differences between socio-demographic groups.

Higher mean scores were seen for the scales 'Social support for health' and 'Understanding health information', lower mean scores were seen for 'Feeling understood and supported by healthcare providers' and 'Navigating the healthcare system'. Associations were seen between lower HLQ scores on various scales and socio-demographic characteristics such as shorter period of time in Portugal, household composition, lower Portuguese proficiency, and irregular migration status.

The study showed that migrants of the MENAP region have difficulties in navigating the Portuguese healthcare system, and in their relationships with healthcare providers. The study also showed that recent migrants, those who do not live with their close families, who are undocumented, and those with lower Portuguese proficiency have lower health literacy compared to their counterparts. These findings provide insight into the areas of health literacy weaknesses and difficulties of the MENAP region migrants in Lisbon and provide guidance for more equitable health interventions.

Key words:

Health literacy, migration, MENAP region migrants

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List of abbreviations

ACM – Alto Comissariado para as Migrações

ANOVA – Analysis of Variance

CHL – Critical Health Literacy

ES – Effect Size

FHL – Functional Health Literacy

GPSS – Global Platform for Syrian Students

HL – Health Literacy

HLQ – Health literacy Questionnaire

HLS-EU – European Health literacy Survey

HLS-PT – Portuguese Health Literacy Survey

IALSS – International Adult Literacy Skills Survey

IOM – Institute of Medicine

MENAP – Middle East and North Africa, Afghanistan, and Pakistan

NGO – Non-Governmental organization

NVS – New Vital Sign

NVS-PT – Portuguese New Vital Sign

OPHELIA – Optimizing Health Literacy and Access

REALM – Rapid Estimate Adult Literacy of Medicine

S-TOFHLA – Short Test of Functional Health Literacy in Adults

TOFHLA – Test of Functional Health Literacy in Adults

WHO – World Health Organization

1. Introduction

Health literacy is a complex concept that includes multiple dimensions related closely to literacy, comprising one's health information, knowledge, and ability to access, understand and use this information to make well thought health related decisions that help in promoting their health and maintaining the quality of life and disease prevention (1).

Health literacy is considered as one of health key determinants (2), an important empowerment factor (3), and a social justice issue (4). It can be observed and used to understand and explain the different outcomes of health and disease, and it has been shown to be an important asset on a personal and communal level that can be developed through different interventions into a larger fit with the current health promotion and an important social health determinant that can be modified to reduce health disparities and improve health equity (5).

Migrant populations face some barriers that undermine their access to healthcare services and thereby limiting public health goals among migrant communities and leading to increased vulnerability to lower levels of health literacy, and to a higher risk of significant health disparities and poor health outcomes (6–8). This may be due to the difficulty in navigating the health care system where people with low health literacy will not know where to go or what to do to get themselves the best health care possible, but also due to the difficulty in understanding and completing documents and consent form, and inability to read directions for prescriptions which makes it harder to look after one's health and well-being. Lower levels of health literacy can also lead to increased use of expensive services, misuse of medications, misunderstanding of self-care instructions and practice of less preventive health care (9). Furthermore, inadequate health literacy can result in an increased use of health care and an increased need for health care work force (10). Poor health literacy can lead to depression, poorer mental health outcome and affect global health status in general (10).

These various types of impacts of low health literacy in the community is far more severe and profound and have a bigger range of consequences on different levels in vulnerable groups such as migrant communities due to the cumulative and additional effects of other life conditions and other several factors related to migration.

The number of migrants among European population is substantially growing (11). At the end of 2017 migrant population in Europe reached almost 10% of the WHO European region (12). In the last couple of decades, a big flow of migrants from the Middle East, North Africa, Afghanistan, and Pakistan has been settling in Europe as a final destination for their migration due to population growth and economic reasons, and of course due to the political conflicts and life conditions after the interventions in Afghanistan and Iraq and the Arab Uprising, making Europe the largest extra-regional destination for these migrants (13). Portugal, being one of the European countries, has also witnessed an increase in both migration and refugees' numbers specially in the recent years (14), including migrants from the Middle East and North Africa.

While general research on health literacy has shown an exponential growth in the past decades (5), only recently health literacy has been gaining recognition in the European research (15), with more research still needed (16). In Portugal, even though health literacy has started being addressed through national policies, the research on health literacy is still scarce (17), especially with regard to migrants' health literacy and particularly among migrants from the Middle East, North Africa, Afghanistan, and Pakistan (MENAP) region. Realizing the challenges facing the European Union in general and Portugal in particular due to the increased flow of migrants from different and somewhat new regions, the main aim of this thesis is to explore health literacy among migrants from the MENAP region population in Lisbon, and study their understanding of health information, their use of health services and their ability to navigate the Portuguese health care system to better understand their health literacy needs.

2. Literature review

2.1 What is health literacy

While fundamentally definitions establish a shared understanding of words and concepts, they also set parameters for inquiry and measures (18). Health literacy had different definitions over the last couple of decades and has been used in different contexts and gained a lot of interest from a wide range of stakeholders as an emerging term. First citation was in 1974 regarding health education in schools and it was by Simonds. However, academically, the first scientific article appeared in the 1980s, the second at the beginning of the 1990s and in 2006 more than 100 articles were issued. A decade later, more than 1,000 scientific publications yearly addressed health literacy according to PubMed (19).

The first official definition of health literacy goes back to 1995 and states that health literacy is the individual's capacity to obtain basic health information, interpret, and understand this information and services and the competence to use such information and services in ways which enhance health (20). The World Health Organization (WHO) defined health literacy in 1998 as social and cognitive skills that determine and define the motivation and ability of individuals to understand and gain access to information and use this information in ways which help in promoting and maintaining good health (21). In 1999, the American Medical Association defined health literacy as a constellation of skills, which include the ability to perform basic numerical and reading tasks required to be able to function in a healthcare environment, while Healthy People 2010 in the US defined health literacy as the degree to which individuals are capable to obtain basic health information, process and understand this information and services needed to make appropriate health decisions (22). Fok and Wong showed the importance of autonomy in their definition of health literacy in 2002, describing it as to understand and act upon psycho-social and physical activities with appropriate standards, having the ability to interact with people and cope with necessary changes and demands in order to achieve complete physical, mental, and social well-being (23). In 2005 Kickbusch and colleagues defined health literacy as the ability to make sound health decision[s] in the context of everyday life – at home, in the community, at the workplace, the healthcare system, the marketplace and the political arena. It is a critical strategy to empower people to increase their control over their health and their ability to seek out information and to take responsibility (24). Kwan et al. (2006) in Canada highlighted the importance of equipping all parties involved including patients, health educators and providers and their engagement in decision-making about health and they used a definition that describes

health literacy as ‘people’s ability to find, understand, appraise and communicate information to engage with the demands of different health contexts to promote health across the life-course’ (25). Zarcadoolas and colleagues in 2005 emphasized in their definition that health literacy is the ability of a person to use the information about health and concepts and apply it in situations that allow participating in ongoing dialogues about health and medicine, public and private ones also scientific knowledge and cultural beliefs, and they defined health literacy as the wide range of competencies and skills that people develop in order to seek out, evaluate, comprehend, and use health information and concepts to make informed choices and decision that help in minimizing health related risks, and increasing their quality of life (26). In 2009 Freedman et al. highlighted the difference between individual and public health literacy and argued that factors affecting people’s health should be viewed at a societal perspective. The European Health Literacy Consortium used a more inclusive definition closing the distance between the individual and societal approach, stating that health literacy is strongly linked to general literacy and entails people’s knowledge, their competencies and motivation to access, information, understand it, appraise it and apply it to form judgments and to make everyday life decisions concerning healthcare, disease prevention and health promotion, to maintain and improve quality of life during their life course (1).

Table 1 (19) outlines some health literacy definitions that are commonly used. The list is not intended to be either exhaustive or exclusive. It draws on the wide range of disciplines from which health literacy has been applied.

Table 1 Health literacy definitions that are commonly used.

No	*Source*	*Definition*
1	Joint Committee on National Health Education Standards (1995)	‘Health literacy is the capacity of individuals to obtain, interpret, and understand basic health information and services and the competence to use such information and services in ways which enhance health.’

2	Nutbeam (1998)	‘The cognitive and social skills which determine the motivation and ability of individuals to gain access to understand and use information in ways which promote and maintain good health.’
3	American Medical Association (1999)	‘The constellation of skills, including the ability to perform basic reading and numeral tasks required to function in the healthcare environment.’
4	Nutbeam (2000)	‘The personal, cognitive and social skills which determine the ability of individuals to gain access to, understand, and use information to promote and maintain good health.’
5	USDHHS (2000)	‘The degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions.’
6	Fok and Wong (2002)	‘To understand and act upon physical and psycho-social activities with appropriate standards, being able to interact with people and cope with necessary changes and; demands reasonable autonomy so as to achieve complete physical, mental and social well-being.’
7	Nielsen-Bohlman et al (2004)	‘The individuals’ capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions.’
8	Kickbusch et al (2005)	‘The ability to make sound health decision(s) in the context of everyday life – at home, in the community, at the workplace, the healthcare

		system, the marketplace and the political arena. It is a critical empowerment strategy to increase people's control over their health, their ability to seek out information and their ability to take responsibility.'
9	Zarcadoolas et al (2005)	'The wide range of skills, and competencies that people develop to seek out, comprehend, evaluate and use health information and concepts to make informed choices, reduce health risks and increase quality of life.'
10	Paasche-Orlow and Wolf (2007)	'An individual's possession of requisite skills for making health-related decisions, which means that health literacy must always be examined in the context of the specific tasks that need to be accomplished. The importance of a contextual of health literacy must be underscored.'
11	Kwan et al (2006)	'… People's ability to find, understand, appraise and communicate information to engage with the demands of different health contexts to promote health across the life course.'
12	European Commission (2007)	'The ability to read, filter and understand health information to form sound judgments.'
13	Pavlekovic (2008)	'The capacity to obtain, interpret and understand basic health information and services and the competence to use such information to enhance health.'
14	Rootman and Gordon-El-Bihbety (2008)	'The ability to access, understand, evaluate and communicate information as a way to

		promote, maintain and improve health in a variety of settings across the life course.'
15	Ishikawa and Yano (2008)	'The knowledge, skills and abilities that pertain to interactions with the healthcare system.'
16	Mancuso (2008)	'A process that evolves over one's lifetime and encompasses the attributes of capacity, comprehension, and communication. The attributes of health literacy are integrated within and preceded by the skills, strategies, and abilities embedded within the competencies needed to attain health literacy.'
17	ABS (2008)	'The knowledge and skills required to understand and use information relating to health issues such as drugs and alcohol, disease prevention and treatment, safety and accident prevention, first aid, emergencies, and staying healthy.'
18	Yost et al (2009)	'The degree to which individuals have the capacity to read and comprehend health-related print material, identify and interpret information presented in graphical format (charts, graphs and tables), and perform arithmetic operations in order to make appropriate health and care decisions.'
19	Adams et al (2009)	'The ability to understand and interpret the meaning of health information in written, spoken or digital form and how this motivates people to embrace or disregard actions relating to health.'

20	Adkins and Corus (2009)	'The ability to derive meaning from different forms of communication by using a variety of skills to accomplish health-related objectives.'
21	Freedman et al (2009)	'The degree to which individuals and groups can obtain process, understand, evaluate, and act upon information needed to make public health decisions that benefit the community.'
22	Massey et al (2012)	'A set of skills used to organize and apply health knowledge, attitudes and practices relevant when managing one's health environment.'
23	Paakkari and Paakkari (2012)	'Health literacy comprises a broad range of knowledge and competencies that people seek to encompass, evaluate, construct and use. Through health literacy competencies people become able to understand themselves, others and the world in a way that will enable them to make sound health decisions, and to work on and change the factors that constitute their own and others' health chances.'
24	Wu et al (2010)	'Health literate individuals are able to understand and apply health information in ways that allow them to take more control over their health through, for example, appraising the credibility, accuracy, and relevance of information and action on that information to change their health behaviors or living conditions.'
25	Sorensen et al (2012)	'Health literacy is linked to literacy and entails people's knowledge, motivation and competencies to access, understand, appraise

		and apply information to make judgments and take decisions in everyday life concerning healthcare, disease prevention and health promotion to maintain and improve quality of life during the life course.'
26	Dodson et al (2015)	'The personal characteristics and social resources needed for individuals and communities to access, understand, appraise and use information and services to make decisions about health. Health literacy includes the capacity to communicate, assert and enact these decisions.'

As we can see, health literacy definitions are often overlapping and have a lot of similarities, however, each definition shed some light on and explained in a clear way one or more of the different aspects of health literacy. Furthermore, these definitions show how health literacy is far from being a one-dimensional simple concept and refer to it as one multidimensional, complex, and heterogeneous concept, and may themselves often describe different aspects of the concept (27). Health literacy is a skill-based process that individuals can use to identify and transform information into knowledge and action. Hence, it is not only about the knowledge that people pursue, but much more importantly, how this knowledge affects them and how does this knowledge enable them to act to maintain and promote their health and the health of others in the society, and to become aware of the role of communities and society at large (19). The relationship between knowledge and skills can be seen in the different types of literacy where according to Nutbeam these types characterize the practical application of literacy skills ranging from those needed to be able to function effectively in everyday situations (functional), providing the ability to understand one's own health issues, perform low skill tasks, or follow directions, especially written information, or information labels. People with low functional health literacy in general have difficulties reading, writing, or calculating. Most of them have not completed their basic education or not maintained their skills in later stages of life, and in their daily life, they are not challenged intellectually and often have simple jobs or have no jobs at all. They may come from minority or migrant groups that are marginalized in society and may live in isolation(28).

Health literacy skills range to more advanced cognitive ones which can be used to actively participate in everyday activities and to apply new information to changing circumstances (interactive), providing the ability to ask questions and identify one's own knowledge gaps. Low interactive health literacy means difficulties explaining or discussing health problems with health professionals. A person with good interactive health literacy skills can easily transfer and discuss his\her health problem and ask questions for a better understanding (28). Limited interactive health literacy affects people experience in using the health care system, even more when everything is new and to be discovered. They feel their relations with health workers are hierarchical and unequal and may be reluctant to ask questions out of the fear or shame of wasting health workers' time. They may not remember quickly what was said in a conversation if they are in a stressed situation and mentally blocked (28). The further advanced cognitive skills can be used and applied to critically analyze information, and to use this information to achieve greater control over life events and situations (critical literacy). These skills provide the opportunity to make informed health decisions in everyday life whether it's at home, at the workplace, in the healthcare system, or in the community (28). Poor critical health literacy skills may prevent people from making decisions based on the knowledge and information available, because of the difficulty to evaluate and assess that information (28). Health literate people can seek out health information from different sources, take responsibility for their health, they know how to get around by consulting others or checking on the internet, and with that, they are able to have a sense of control over their health (28).

Similarities between health literacy definitions are greater than differences. Sharing the same essence and purpose, differences can be only noticed when we go deep into detailed and specified aspects of health literacy (29). Most of these definitions cover the three basic types of health literacy (Basic/functional health literacy, Communicative/interactive health literacy and Critical health literacy). This multidimensional and complex concept is expanding and growing every day, and so is our understanding of it.

2.2 Impacts of health literacy

2.2.1 Health literacy and health outcomes

The relationship between literacy and health status is well documented in the scientific literature (30). Individuals with low health literacy are less likely to: understand oral and written information provided by health workers, being able to navigate through the health system to obtain the necessary services, perform the necessary procedures, and follow prescribed indications (31–33). As a result, it is now known that an inadequate level of health literacy entails many costs to the healthcare system (32).

Low health literacy has been identified in several studies as a risk factor for many diseases, namely: obesity (inadequate health literacy has been linked to higher body mass index values), diabetes, cardiovascular disease, and cancer (34,35). Adequate levels of health literacy appear to result in improvements in people's health status (36,37). Recent studies highlight the relationship between inadequate literacy and higher mortality rates, and the risk of mortality in the elderly is clearly higher in people with low health literacy (38). The reasons for this relationship lie much in the poorer ability of older people to take medicines correctly, in poorer ability to interpret health labels and messages, and in poorer general health conditions in this population group (39). The literature points out that older people, the chronically ill and those who need to take medication regularly (considered as the most vulnerable groups) are most affected by inadequate levels of health literacy and experience more the severity of these effects (38). However, the literature also points out that the effects of inadequate health literacy on health outcomes can be mitigated through social support or the characteristics of the health system itself (39).

The literature reviewed on literacy promotion interventions to improve health outcomes demonstrates that there are several interventions with significant outcomes. Health self-management programs appear to be effective in reducing the prevalence of some diseases, and the development of some platforms and / or specific materials to promote health literacy are effective and efficient strategies for self-management of chronic diseases, including diabetes, obesity, asthma and hypertension, and adherence to therapy (40).

2.2.2 Health literacy and health service utilization

According to the literature, an inadequate level of health literacy is strongly linked to poor knowledge or understanding of both care services and health outcomes themselves, and may also be associated with a high likelihood of hospitalization (41), with longer periods of hospitalization, more diagnostic tests and poor adherence to drug therapy at a high prevalence and severity of some chronic diseases, worse general health conditions, and a devaluation of prevention and screening services (42).

As stated by the United States Institute of Medicine (IOM), it is also negatively related to self-management of chronic diseases such as diabetes, high blood pressure, asthma, cardiovascular disease, and the human immunodeficiency virus (HIV) / AIDS, and with self-monitoring of health (43).

According to a study in the US by World Health Communication Associates, about 50% of the adults there have difficulties in understanding the provided health information, and most cannot recognize and understand risk factors, act in accordance with the information provided or navigate their healthcare system (44).

A study conducted at Medicare found that older people had lower health literacy levels regarding health care utilization (45). As noted earlier, the problem of low health literacy levels affects various aspects of health care, particularly in regard to medication and adherence to therapy. Recent studies highlight the relationship between an inadequate level of health literacy and confusion regarding physician-prescribed medications, medication errors, a lack of understanding of information leaflets (46)(43). Medications may be prescribed, but without the ability to understand the instructions, people often make mistakes in taking the medications, which can be serious, leading to incorrect adherence to therapy and a lower therapy efficacy (43)(47) .

Few patients fully understand why the medication is taken for, how to take it, and what interactions some drug combinations can have on their side effects. The available literature on the subject is full of examples of gaps between what patients should know and what they really know about their medication (43). One of the strategies that has been adopted to improve adherence to therapy and reduce these gaps is the promotion of health literacy, in order to empower the person to actively participate in the decision on which therapy to take (48). Studies that have been developed in the field of adherence to therapy show that people increasingly want to take part in managing their health, to have more information and become an active element in interaction with health professionals (49).

The literature also shows that health literacy strategies to promote early diagnoses of certain diseases, including cancer, have been increasing and becoming more effective over the last years (50).

2.2.3 Health literacy and health care costs

The evidence on the relationship between the level of health literacy and costs to the health care system is still limited, therefore, it is difficult to accurately determine the impact of health literacy on healthcare expenditure, both from an individual and system-wide viewpoint (48). However, and as a consequence of the foregoing, which essentially translates into inefficient use of the health system, it is now known that a low level of health literacy entails many costs to the healthcare system (32,51).

A study by the American Medical Association points out that the cost of low health literacy represents an economic loss of around 73 million US dollars a year, and It is also estimated to cost 100-200 million dollars annually in the United States (52).

Through a systematic literature review analyzing the costs associated with inadequate levels of health literacy, Eichler concluded that, at the system level, additional costs are equivalent to about 3-5% of the total health budget, and that at the individual level, each person with a low level of health literacy spends an extra $143-7,798 per year on health care(53). Obesity-related health problems in the US account for 9.1% of clinical spending, and about $147 million extra spending on treating diabetes and other common diseases in an overweight population could be directed to interventions promoting health literacy, potentially resulting in significant savings in care spending (54).

There is still no evidence in Portugal on the issue of individual costs and system costs of inadequate health literacy levels of the population. However, it is well-known that long-term situations - such as cancer, diabetes, and cardiovascular disease - are the most prevalent and most expensive for the health system, therefore health literacy can play a central role in preventing them and in increasing adherence to treatment plans once diagnosed (48).

Recognizing the importance that health literacy may have in this context, the National Health Education, Literacy and Self-Care Program was implemented in 2016, aimed to strengthen the role of the citizen in the Portuguese health system and to make information, knowledge of the informed decision, privileged vehicles for this reinforcement. However, there is still insufficient evidence available to correlate the costs associated with the implementation of these programs in view of the reduced costs and improved care they provide (48).

2.3 Migrants' health literacy

Health literacy has been considered a key resource for interventions to help in eliminating and reducing health disparities affecting vulnerable populations, where many migrants are included (55,56). Effective health communication is needed to help populations, especially those foreign-born, to face health threats, and to recognize, minimize and respond effectively to potential health problems (57), therefore health literacy of migrants is of great relevance.

Migrants in today's world are facing many significant difficulties, and once leaving their countries, migrants become more vulnerable (58,59). Such difficulties could be the result of their socioeconomic conditions in host countries, where migrants are also isolated, insecure, and socially excluded, making them more vulnerable in their ability to anticipate, cope, and recover from the impact of diseases (60).

Migrants' health vulnerability can also arise when their ability to access health care services is hindered because of their lack of skills, lack of social networks in the new country, and the shock and stress they faced during and following their migration journey (60).

Alongside these difficulties there are challenges in terms of knowing how to inform themselves regarding their health issues in the host countries, how to describe their complains to doctors and health professionals, and how to apply health information they encounter or find or search for to their own situation. In fact, these tasks are not easy to do for native citizens in their own societies and even more so for migrants, which can heighten social and health vulnerability for the migrant community (58,59).

Migrants are confronted with multiple barriers to health literacy, such as the lack of meaningful information about health issues or how to access preventive services, which may contribute to the deterioration in health status of migrants over time (61). In addition to these barriers, health providers throughout their professional education and training, are taught to use precise technical language to discuss body parts and processes, disorders and treatments, a habit that usually continues throughout their professional careers (62), health care providers training does not normally include dealing with foreign immigrants or non-native language speakers which makes it more difficult for immigrants to understand and know what they need to do and how to do it (62).

In 2013 in Sweden, a study was conducted by Wångdahl et al. to determine functional health literacy (FHL) and comprehensive health literacy (CHL) levels among refugees and to investigate furthermore the relationship between health-related and socio-

demographic factors and inadequate health literacy (63). Wångdahl, et al. found that 60% in the total study population were observed to have inadequate FHL, 80% had limited FHL (inadequate or problematic FHL), 27% were found to have inadequate CHL and 62% limited CHL (inadequate or problematic CHL) (63).

When reviewing the literature, multiple studies have examined migrants' health literacy levels when compared with native populations. In 2010, NG & Omariba studied the difference in health literacy and health outcomes between immigrants and non-immigrants (local born) in Canada, and related factors to health literacy in immigrants such as arrival age, recency of arrival and country of origin, using the International Adult Literacy and Skills Survey (IALSS). Immigrants and non-immigrants were different when comparing their health literacy levels, 75% of immigrants compared to 55% of non-immigrants lack the requisite literacy skills to maintain health. Immigrants were more likely to have low health literacy compared to non-immigrants, even after adjusting for numerous factors including age, sex, literacy practices at home and work, own and maternal education, concordance between mother tongue and test language, employment status, household income, participation in adult education and training (64). Immigrants from non-European countries were found less likely to have high scores in health literacy (64).

In 2017 a study conducted in Switzerland using the Short Test of Functional Health Literacy (S-TOFHLA) showed that migrants had lower levels of functional health literacy when compared to non-migrants (65). Villadsen et al. (2020) conducted a study to measure health literacy among migrant women, which were found to have lower level of health literacy when compared with women of Danish origin (66).

2.4 The multiple factors associated with health literacy among migrants

The literature shows that certain demographic groups tend to be more vulnerable with regard to health inequalities (16). People with migration background, low level of education and older people have low health literacy according to the European health literacy survey (67).

Multiple studies showed that older age, lower education and not having private health insurance are associated with lower health literacy (68–71). Beauchamp et al. (2015), when studying health literacy strengths and weaknesses across socio-demographic groups, found similar results (72), while Svendsen et al. (2020) found that males, younger individuals, migrants, people with lower level of income and basic education than the national average and people with social benefits were at a higher risk of

inadequate health literacy (73), and low health literacy was independently associated with lower socioeconomic position (73).

A study in Germany in 2015 showed that health literacy is significantly low in population groups classified as disadvantaged from a socioeconomic perspective, when compared to the general population (74). It also showed that the difference in health literacy between adolescents with and without a migration background can be traced back to socio-economic differences (74). The current results of youth and migration research show that differences between adolescents with and without migration background are often due to inequalities in living conditions and realization opportunities (75,76).

It is well documented in the literature that being born in another country and not speaking the language of the destination country and having lower levels of education are associated with lower level of health literacy (72,77). The concept of culture and language formally entered discussion of health literacy with the acknowledgement of International Organization of Migration in 2004 that culture affects health literacy skills. The culturally bound beliefs, values, and preferences a person holds influence how a person interprets health care message (78). These beliefs, values and preferences also affect how a person seeks to know and find health information, what a person knows about what services is entitled too, in general affect their whole approach of navigating the health care system. Too often, people with the highest burden of chronic diseases have poor access to health-related information and low, insufficient ability to process that information and make use of it. Health care providers with the lack of training, are often unable to recognize when cultural differences between patient and provider contribute to misunderstandings around chronic disease management, health status, disease severity and treatment regimens (79).

Previous research shows that communities that are culturally and linguistically diverse are less likely to be able to manage their health, get access to needed healthcare services, and understand their health-related issues (80). As mentioned earlier, for the basis of health literacy to be formed, basic skills need to be applied in health contexts. To be health literate, one requires the ability to effectively apply a variety of skills in order to accomplish often demanding health related tasks. These skills include reading, writing, listening, and speaking, critical thinking, decision-making and numerical computing (19). Language and culture have multiple effects on how immigrants acquire these skills and, on their ability to apply them in different health related situations. Studies showed that recent immigrants are less likely to report health conditions in comparison with long-term immigrants who have been affected more by the new culture, which suggests cultural

influences on the perception of the disease that change as immigrants become more acculturated to the new lifestyle (81), On the other hand, long-term immigrants have a bigger chance in learning the language and eliminating and removing some of the barriers encountered in their new community (81).

2.5 Migration trends in Europe and Portugal

By the end of 2016, 57 million migrants were residing in Europe, 37 million were born in a non-European country, around 3 million were refugees and asylum seekers (82). The number of displaced people around the world due to the violent conflict and human rights violation has grown drastically in the past decade. Europe has become an immigration continent since the second half of the 20th century (82). Different patterns of migration have led to a highly diverse migrant population in Europe, in regard to ethnicity, languages, cultural and religious backgrounds (82).

The increase in the flow of migration to Europe is mainly due to the wave of migrants crossing the Eastern Mediterranean route (Turkey to the EU) (83,84). This passage has clearly become the main entry route for migrants, as opposed to the main route in the beginning of the decade, the central Mediterranean route (North Africa to EU) (83,84). It should be noted that the highest percentage of irregular migrants in Europe is due to the expiry of stay visas (83,84).

The migration context in the middle east and north Africa can be described as a component of three linked patterns: forced displacement and migration due to the multiple crises and conflict in the region especially in Syria, Iraq and Libya, a complex flow of irregular migration towards Europe as a result of different factors especially economic factors, and labor migrant's movement (regular or irregular movement) inside or outside the region (85). In 2015 Europe received an increased flow of first-time asylum seekers compared to the previous years and it was largely to the high numbers coming from Syria, Afghanistan and Iraq (83). Nearly 24 million migrants, including refugees, from the Middle East and North Africa were living outside of their country of birth in 2015, accounting for 10% of the international migrant stock (83). Europe is the main extra-regional destination of these migrants hosting about one third of the 24 million (83).

Portugal has evolved to a country of immigration after being a country of emigration for a long time (86). In most cases, migration in Portugal is the result of a diversified historical, economic, and social process, and it is a complex and multidimensional reality that can be characterized by seasonal, temporary, and long-term migration (86). After 2008 migration to Portugal was associated more with students (higher education) and

family reunification (87). Migrants' number with foreign nationality in Portugal has doubled twice in the past couple of decades and it continues to increase since the decline caused by the economic crises (87). In 2019 for the fourth consecutive year there was an increase in the foreign resident population in Portugal totaling 590,348 foreign citizens, the highest value recorded by SEF since its emergence in 1976 (87). Migration flows from Brazil remain the highest in Portugal representing 25.6% of the total number of immigrants residing in Portugal in 2019, with large numbers of migrants form Europe, the United Kingdom, and the Portuguese-speaking African countries especially Cabo Verde (87). Portugal is not considered a traditional country of destination for migrants of the MENAP region in Europe, receiving only 0.05% of the total number of migrants from the Middle East and North Africa residing in Europe in 2005 (88), however, since the political conflict started in multiple countries of the MENAP region Portugal has been receiving larger flows of migrants of that region, including refugees and asylum seekers, as one of the Euro-Mediterranean countries (89).

2.6 Health literacy in Portugal

As in other European countries, Portugal felt the need to know the level of health literacy of the population, having for this purpose included some health-related issues in a general literacy study, this first effective contribution to bench marking national literacy dates back to 1995 and revealed low or extremely low health literacy levels (90). In 2014 the Portuguese health literacy survey (HLS-PT) was developed and applied in Portugal by taking advantage of the experience derived from the European Health Literacy Survey (HLS-EU) in order to help health literacy research in the Portuguese context (17). Espanha & Avila adapted the questionnaire-based survey used within the framework of the European research using indicators that take account of the complexity of health literacy skills and distinguish between four ways of dealing with important health information: the ability to access and appraise health information, understanding health information and Its application in a variety of different situations, and found that the better health literacy levels were concentrated among individuals with higher levels of education, younger population (up to 45 years) and the largest number of individuals with higher levels of health literacy was concentrated among professionals and managers (17).

In 2017, through the adaptation of the Newest Vital Sign (NVS-PT) instrument, a study was conducted in order to measure the prevalence of limited health literacy in the

Portuguese population (91). The prevalence of limited health literacy was estimated to be of almost three in four people in the Portuguese population (72,9 % of the population aged between 16 and 79 years), and were classified in two groups: intermediate category and lowest category, with possibility of limited health literacy and high likelihood of limited health literacy respectively, association was observed between limited health literacy and older age which was consistent with the results found by the European health literacy survey and other studies conducted in other countries (91).

Even though it has started being addressed through national policies, the studies on health literacy and migrant health in Portugal are still scarce (17,92), with limited evidence provided on health literacy among even more specific migrant groups, particularly those recently arrived, such as MENAP region migrants.

2.7 Measurement of health literacy

We can look at the measurement of health literacy in the same way as evaluating school obtained education, the measurement of health literacy level is always better achieved when we have the context and content in a well-defined manner, for different ages and stages of life different measurement tools will be required even though the concept might remain constant (93). Given the impact of health literacy levels in multiple domains of the individual and collective health and the use of available health resources, it has become imperative and especially important to develop diagnostic tools for the health literacy level of populations and communities (94). Since people with inadequate or poor levels of health literacy show significant difficulties in understanding medical prescriptions, following health-related instructions and even the basic monitoring of bio metric parameters, they also show higher hospitalization rates, higher health care costs and in general, poorer overall health, therefore, assessing health literacy is a key aspect of improving the health of the public (95). The existence of various definitions of health literacy also suggests the existence of various tools of measurement, depending on the reason behind measuring health literacy we will have different tools to do that, each different situation could require and invoke the need of different type of health literacy measurement tool. The most widely used instruments for measuring health literacy are the Test of Functional Health Literacy in Adults (TOFHLA) and the short S-TOFHLA, Rapid Estimate of Adult Literacy in Medicine (REALM) and the Newest Vital Sign (NVS) (96). However, these instruments, as they have mainly focused on the assessment of

cognitive literacy skills (reading ability and, in some cases, the ability to use numeracy and to calculate drug dosages) to measure the literacy levels of populations, they are still insufficient to measure health literacy in a way that satisfies the most recent definitions (48). The health literacy questionnaire (HLQ) was designed to capture and measure health literacy in all aspects of the concept, with nine separate scales, each scale describing one aspect of health literacy (97). The HLQ was used successfully in the Ophelia process (Optimize Health Literacy and Access) in 2017 to measure health literacy needs and strengths aiming for co-design of a group of interventions to improve health literacy and equity of access (97).

Overall, the development of tools related to specific definitions of health literacy has begun, and these tools will need to be used to help research and efforts in order to design interventions and implement these interventions to be aligned more specifically with the needs of people with limited health literacy (98).

2.8 Health promotion

In 2007, the WHO commission on Social Determinants of Health published a document identifying health literacy as a key indicator of health inequalities in both rich and poor countries (99). According to Parker in 2000, it is not surprising that a population's low level of literacy is directly and indirectly linked to a range of poor health outcomes, changing living, working and leisure standards have a significant impact on health (99).

The literature shows that improving health literacy in migrant population is critical for empowering these populations, promoting their health, and helping them become more active participants in managing their health (100), however, the literature also revealed a lack of interventions designed specifically for these migrant population (101) such as the migrant population of the MENAP region. The advancing research aiming to overcome health literacy problems raises hope for a set of strategies and interventions that can reduce inequalities in treatment and outcomes and thus for a clearer road to realizing health equity (102), giving the low level of health literacy shown in the literature in migrant populations and its significance for assuring adequate access to health resources, interventions on health literacy are significantly important to promote their health and healthy behavior on an individual, organizational and community level (101).

Health literacy and health promoting behaviors are both regarded as key factors in promoting health and quality of life (103,104).

Health literacy research and targeted interventions would be of a great benefit for migrants of the MENAP region as for any other group of migrants (66), health literacy

has an important role as a potentially modifiable contributor to health inequalities with a big influence of health literacy level on the personal and social development and integration of migrants in their new communities, investigating health literacy and strategies aiming to improve migrant health literacy can be an effective way to influence their health-seeking behaviors, to help them overcome the linguistic and cultural barriers, to improve their health and overall reduce health inequalities in their host countries (105).

Furthermore, promoting health literacy can reduce existing inequalities as it is shown in the literature that low health literacy in groups as migrants can further reinforce already existing inequalities (106), giving that vulnerable groups are at the most risk of health inequalities and limited health literacy. Health promotion helps in generating safe living and working conditions that are also stimulating and pleasant. Health promotion works through concrete and effective community action in setting priorities, making decisions, planning strategies, and implementing them to achieve better health, and at the heart of this process is the empowerment of communities, their ownership and control over their own enterprise and destinations (107). The Ottawa Charter outlines as commitments to health promotion: the implementation of healthy public policies and equity in all sectors, the recognition of people as the main health resource, recognition of health and its maintenance as an important investment and a social challenge, also has given us a vision: health and well-being for all through the promotion of literacy and empowerment of people and communities (107).

Newly arrived migrants such as migrants from the MENAP region in Portugal face different health challenges (108). Investigating health literacy in such highly understudied groups could be essential to create public policies targeting these groups, to answer their health literacy needs, promote their health, and reduce inequalities across all health sectors.

3. Objectives

The main aim of this study is to explore health literacy among migrants from the MENAP region population in Lisbon, and study their understanding of health information, their use of health services and their ability to navigate the Portuguese health care system. More specifically it has two objectives:

1- Examine health literacy levels in a population of the new wave of migrants from the MENAP region in the metropolitan area of Lisbon, their health literacy needs and use of Portuguese health care services.
2- Explore the relationship between health literacy and socio-demographic characteristics of this population.

4. Methods

4.1 Study design

The present study is of a quantitative nature with a descriptive cross-sectional and analytical design.

This study draws from the first phase of the project “Health Literacy, Health Promotion and Social Cohesion in Migrant Populations” coordinated by Professor Sonia Dias, promoted by NOVA National School of Public Health, aiming to optimize health literacy, health promotion and social cohesion in support of prevention of NCDs among migrant populations, thus contributing to improve health outcomes and reduce health disparities. The first phase of the project consists of the application of the Health Literacy Questionnaire (HLQ) to migrants.

4.2 Study sample:

The inclusion criteria are:

- Being born in one of the countries of MENAP region (Middle East, North Africa, Afghanistan, and Pakistan).
- Being 18 years of age or older.
- Reporting oral or written comprehension of Arabic or English or Portuguese.
- Residing in the Metropolitan Area of Lisbon.

The exclusion criteria are:

- Presenting visible cognitive and / or emotional impairments.
- Being under the influence of alcohol or drugs.

4.3 Process of recruiting participants and collecting data

Participants were recruited through the collaboration of entities close to migrant communities or socialization sites, namely non-governmental organizations (NGOs) that support migrants, immigrant associations, as well as governmental and other organizations including the High Commissioner for Migration (ACM) and The Global Platform for Syrian Students (GPSS). To this end, the aforementioned entities were contacted and invited to collaborate in the study, in order to establish places for recruiting

participants and collecting data. The collaboration of these entities was also requested for the dissemination of the study to its users.

Due to the nature of the targeted population of this study, which was found to be hard to reach, and given the little information available about the size and magnitude of the population, network sampling was used in the process of recruiting participants in order to reach a sufficient number.

All migrants who fitted the criteria of inclusion and were present in the referred entities on the days scheduled for data collection were approached and invited by a trained interviewer to participate in the study. At that time, the purpose of the study and the conditions of participation were explained to them, and their informed consent was obtained.

The data collection process took place in a space prepared for the purpose in the referred entities, in a suitable place for the participant, which were welcoming, comfortable and guarantee the privacy of the participants, Data were collected using the HLQ which was self-administered or applied by the interviewer. All questions and doubts that participants had were answered by the investigator who was available at the data collection place. Due to the pandemic constraints of COVID-19 the research team also invested in data collection using an online link to the data collection instruments and using phone calls led by the investigator. The process of data collection took about 9 months, resulting in a study sample of 86 migrants from the MENAP region.

4.4 Data Collection Instruments

The data collection instruments that were used in the study are the Health Literacy Questionnaire (HLQ) and the Demographic, Socioeconomic and Health Condition Questionnaire. The HLQ, developed by Osborne et al. was constructed using a validity driven approach and was shown to have robust reliability, validity and acceptability to both communities and clinicians (109,110). The HLQ has been used successfully in the Ophelia process to design and generate a wide range of interventions in health literacy field in order to improve health literacy and equity of access (97).

The HLQ comprises a total of 44 questions and is available in several languages. It measures nine independent domains of health literacy to capture the lived experiences of people trying to understand, access and use health information and health services (111) namely at the level of: 1) feeling understood and supported by health professionals;

2) have enough information to manage health; 3) actively manage health; 4) have social support for health; 5) critically appreciate health information; 6) being able to actively interact with health professionals, 7) knowing how to navigate the health system; 8) be able to find good health information; 9) understand health information well enough to know what to do.

The HLQ can be self-administrated by the participants or through an interview by the interviewer to insure the inclusion of participants with reading difficulties or other self-administration difficulties. Each scale from 1 to 5 has four-point ordinal response options (Strongly Disagree, Disagree, Agree, Strongly Agree), while scales from 6 to 9 have five-point ordinal response options (Cannot Do or Always Difficult, Usually Difficult, Sometimes Difficult, Usually Easy, Always Easy).

Within the scope of this study, authorization was requested from the authors of the HLQ to use the questionnaire, and approval was given on condition that the use of the HLQ is limited to the present study.

The Demographic, Socioeconomic and Health Condition Questionnaire includes questions about sex, age, marital status, household composition, country of origin, length of residence in Portugal, education, occupational status, migration status, income level, level of fluency in Portuguese, perception of health status, chronic illness, and disability, and use of health services and health insurance in Portugal, based on the questions used in the 2014 National Health Survey. The questionnaire was tested on a sample of users not involved in the study, in order to ensure legibility, suitability and clarity of the questions, and reformulate them before using it in the study. Both instruments were available in Portuguese and English, as well as in the other languages used by the communities under study. The completion of the questionnaires took approximately 30 minutes.

4.5 Data analysis

HLQ scores and socio-demographic data were analyzed using SPSS version 26 (112). Missing HLQ item scores where imputed using the scale mean where there were fewer than 2 missing values from scales with 4 or 5 items and fewer than 3 missing values from the 6-item scale (113). All scales except scale 8 were not normally distributed, scales 1-4 and scales 6 and 8 also violated homogeneity of variances, therefore, robust analysis of variances (ANOVA) was used for analysis of HLQ scores using the Welch method. Each HLQ domain has been demonstrated to be conceptually distinct and measure independent constructs confirmatory factor analysis (109–111). When required, post hoc

testing was undertaken using Tukey's test and the Games-Howell method of multiple means comparisons.

Effect sizes (ES) for differences in means between socio-demographic groups were calculated using Eta squared in SPSS with interpretation of ES as follows: 'small' ES >0.01-0.06, 'medium' ES approximately 0.06-0.14, and 'large' ES >0.14 (114). Where relevant, 95% confidence intervals were calculated, a p-value of <0.05 was assumed for statistical significance.

4.6 Ethical considerations

For the collection of data, written consent was obtained from all participants, in both the physical questionnaire and the online form. The information sheet for the participant and the declaration of informed consent were written in a simple, coherent, and comprehensible language for all participants, being made available in the languages used by the communities under study.

In the case of self-administration and administration by the investigator through a face-to-face interview, informed consent was available in two copies of the same content, and after the participant's approval, one copy remained in the possession of the researcher and the other in the possession of the participant. The information leaflet described the objectives of the study, the data collection procedure, the participant's rights, benefits, and potential risks, with voluntary participation, the anonymity of the participants and the confidentiality of the data collected being ensured.

To guarantee the anonymity of the participants, in both instruments of data collection, no information was collected that allows personal identification (such as name, address or telephone contact). Each participant was assigned a numeric identification code that appear in the two questionnaires. Participants were informed that their participation in the study is completely voluntary, and they can withdraw at any time, without any consequences.

The confidentiality of the data is guaranteed as the completed questionnaires will be stored in a safe place. Only the investigation team will have access to the information collected. The data was inserted into a database, protected by a code, with access available only to the research team. The questionnaires filled out by the participants will be stored in a safe and restricted access, available only to the research team, being eliminated 5 years after the publication of the thesis and / or articles produced within the scope of the study.

Participants were informed of the benefits of their participation, namely, the contribution to the advancement of scientific knowledge about Health Literacy in migrant populations and to the adoption of policies that promote their health. There was no incentive to participate in the study, and the participants were informed accordingly. Participants were also informed that their participation in the study does not carry any risks. The results of this study will be used only for the purpose of scientific publication, and it is not possible at any time to associate any results with specific individuals.

Ethical approval was obtained from the NOVA Medical School Ethics Committee (nº142/2019/CEFCM).

5. Results

A total of 86 participants were recruited from different organizations and locations, the majority of participants were from Syria and Pakistan 50% and 30.2%, respectively. 54.1% spoke Arabic and 27.9% spoke Urdu as their mother tongue. 58.3% reported the ability to speak and understand Portuguese. Table 2 provides descriptive details of the socio-demographics of the included sample.

Participants were mostly male (59.3%), with an average age of 32 years (SD = 6.5) and were single (63.5%) or married/living with a partner (36.5%). Only 10.5% did not finish their secondary education with 37.2% with a bachelor's degree and 24.4% finished their post graduate education. 88.4% were documented (migrants with authorized residence permit from the Immigration and Borders Service - SEF) and 8.2% were going through the process of regularization, 67.4% of participant have been living in Portugal between 1 to 5 years at the time of data collection. 48.2% were living alone, while 37.6% were living with their families. 43.6% were working full or part time jobs and 29.4% were students while 20.9% were unemployed and 3.5% with home duties. 64.7% of participants had monthly income less than 650 € (including social benefits). 58.3% reported the ability to speak and understand Portuguese. Only 11.8% had a private health insurance. 24.7% reported less than good health situation with 72.9% not reporting any chronic diseases. 50% of the sample did not require assistance to complete the questionnaire.

Table 2 Socio-demographic characteristics of the study sample (n=86)

	n	%
Sex (n=86)		
- female	35	40.7
- male	51	59.3
Age (years) (n=86)		
- 18-25	10	11.6
- 26-45	72	83.7
- 46-65	4	4.7
Education level (n=86)		
- 1st cycle	1	1.2
- 2nd cycle	4	4.7
- 3rd cycle	4	4.7
- Secondary education	24	27.9
- Bachelor's degree	32	37.2
- Post graduate degree	21	24.4
Migration status (n=86)		
- Documented	76	88.4
- Under regularization	7	8.1

- Undocumented	3	3.5
Marital status (n=85)		
- Single	54	63.5
- Married or living with a partner	31	36.5
Household composition (n=85)		
- Alone	41	48.2
- Close family	29	34.1
- Extended family	3	3.5
- Flat mates/ roommates	12	14.1
Work situation (n=85)		
- Full time job	27	31.8
- Part time job	10	11.8
- Unemployed	18	21.2
- Student	25	29.4
- Working student	1	1.2
- Home duties	3	3.5
- Voluntary work	1	1.2
Monthly income (n=85)		
- Less than 650 €	55	64.7
- 650 € to 999 €	18	21.2
- Equal or more than 1000 €	12	14.1
Self-reported health situation (n=85)		
- Very good	27	31.8
- Good	37	43.5
- Fair	17	20.0
- bad	4	4.7
Chronic diseases (n=85)		
- none	62	72.9
- asthma	2	2.4
- hypertension	2	2.4
- lower back pain	7	8.2
- diabetes	2	2.4
- depression	5	5.9
- arthritis	1	1.2
- CVA	1	1.2
- Migraine	2	2.4
- Anemia	1	1.2
- Endometrioses	1	1.2
- Cardiac disease	1	1.2
- Sinusitis	1	1.2
- Allergies	1	1.2
- Chronic knee pain	1	1.2
Length of stay in Portugal (n=86)		
- Less than 1 year	7	8.1
- 1 to 5 years	58	67.4
- 6 to 10 years	21	24.4
Private health insurance (n=85)		
- Yes	10	11.8
- No	75	88.2
Understand and speak Portuguese (n=84)		
- Yes	49	58.3
- No	35	41.7

Mean scores for HLQ scales are shown in table 3, with the distribution of each scale depicted in figure 1. For the first five scales, with response options ranging from strongly disagree to strongly agree (range 1 to 4), the highest overall score was seen for the fourth scale 'Social support for health' (mean score 3 (SD 0.49)). The lowest score was for the first scale 'Feeling understood and supported by healthcare providers' (mean score 2.4 (SD 0.66)). For the scales 6 to 9, with scores ranging from 1 (cannot do or very difficult) to 5 (very easy), the highest score was seen for 'Understanding health information well enough to know what to do' scale (mean 3.46 (SD 0.77)) and the lowest score was for the seventh scale 'Navigating the healthcare system' (mean 2.97 (SD 0.58)). Only three participants were shown to be missing data across one or more HLQ scales.

Table 3 Health literacy questionnaire scores (n=86)

	Mean (SD)
HLQ scale	
	Range 1 (lowest) – 4 (Highest)
1. Feeling understood and supported by healthcare providers (n=86)	2.40 (0.66) [2.26, 2.54]
2. Having sufficient information to manage my health (n=86)	2.69 (0.52) [2.58, 2.80]
3. Actively managing my health (n=86)	2.85 (0.53) [2.74, 2.97]
4. Social Support for health (n=86)	3.00 (0.49) [2.90, 3.11]
5. Appraisal of health information (n=86)	2.79 (0.50) [2.68, 2.90]
	Range 1 (lowest) – 5 (Highest)
6. Ability to actively engage with healthcare providers (n=86)	3.15 (0.77) [2.99, 3.32]
7. Navigating the healthcare system (n=86)	2.97 (0.58) [2.84, 3.09]
8. Ability to find good health information (n=85)	3.43 (0.67) [3.28, 3.57]
9. Understanding health information well enough to know what to do (n=85)	3.46 (0.77) [3.30, 3.63]

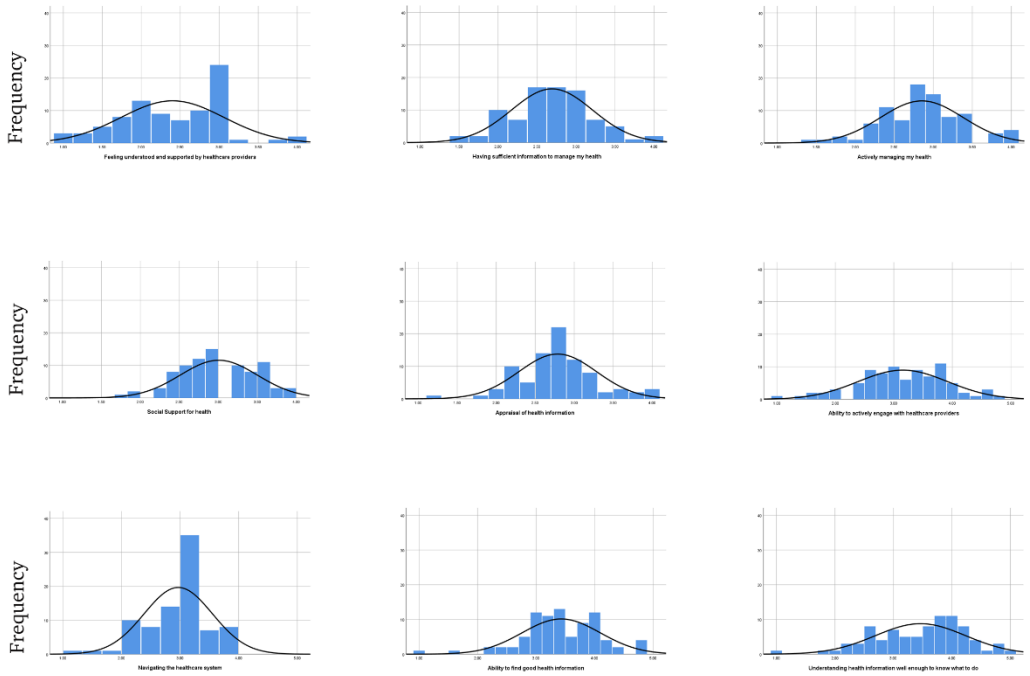

Figure 1 Distribution of HLQ scales for the overall sample

Table 4 shows patterns of HLQ scores according to socio-demographic status. The following description of differences across the HLQ scales includes differences found to be statistically significant at $p<0.05$.

Length of stay in Portugal was found to have a significant effect on scale 9 scores 'Understanding health information well enough to know what to do', where it was shown that participants who have been in Portugal for less than one year at the time of the study had lower scores in this scale in comparison with participants who stayed for one to five years (-0.91), and the ones who stayed between 6 to 10 years (-1.27), no statistically significant difference was found between the other two groups. The same scale showed differences in means between documented and undocumented participants where it was shown that documented participants had higher scores in 'Understanding health information well enough to know what to do' (0.59). Marital status was found to have a significant effect across two scales, single participants showed lower scores in scale 1 'Feeling understood and supported by healthcare providers' (-0.44), and scale 6 'Ability

to actively engage with healthcare providers' (-0.41) in comparison with participants who are married or living with a partner.

Household composition was found to have a significant effect on differences in means across four of the HLQ scales, scale 1 'Feeling understood and supported by healthcare providers', scale 4 'Social Support for health', scale 6 'Ability to actively engage with healthcare providers', and scale 9 'understanding health information well enough to know what to do'. The results showed that participants living with flat mates or roommates when compared to participants living with their close families were found to have lower scores across all four scales (-0.86), (-0.45), (-0.90), (-0.74) respectively, when compared with participants living alone, those who were living with flat mates or roommates had lower scores in scale 1 (-0.59), scale 4 (-0.39), and scale 6 (-0.72).

Students had lower scores in scale 1 'Feeling understood and supported by healthcare providers' when compared to participants without a paying job (-0.63).

Compared with those who understand and speak Portuguese, not speaking and understanding Portuguese had a significant effect on differences of means across three scales (6, 7, 9), 'Ability to actively engage with healthcare providers' (-0.39), 'Navigating the healthcare system' (-0.30), and 'Understanding health information well enough to know what to do' (-0.41).

Table 4 Association between HLQ scores and socio-demographic characteristics

		Scale 1 (n=86)	Scale 2 (n=86)	Scale 3 (n=86)	Scale 4 (n=86)	Scale 5 (n=86)
		Mean score (SD)				
Sex	Female	2.45 (0.68) n=35	2.77 (0.43) n=35	2.92 (0.54) n=35	3.13 (0.46) n=35	2.87 (0.48) n=35
	Male	2.37 (0.65) n= 51	2.64 (0.59) n= 51	2.81 (0.52) n= 51	2.92 (0.51) n= 51	2.73 (0.51) n= 51
Age group	18-25	2.25 (0.46) n= 10	2.85 (0.41) n= 10	3.00 (0.39) n= 10	2.94 (0.44) n= 10	2.94 (0.43) n= 10

	26-45 46-65	2.42 (0.68) n= 72 2.38 (0.92) n= 4	2.66 (0.54) n= 72 2.81 (0.24) n= 4	2.83 (0.56) n= 72 2.90 (0.26) n= 4	3.02 (0.51) n= 72 2.93 (0.50) n= 4	2.77 (0.52) n= 72 2.70 (0.35) n= 4
secondary education	No Yes College or more	2.44 (0.85) n= 9 2.47 (0.56) n= 24 2.36 (0.68) n= 53	2.42 (0.40) n= 9 2.65 (0.58) n= 24 2.76 (0.50) n= 53	2.78 (0.35) n= 9 2.78 (0.42) n= 24 2.90 (0.60) n= 53	3.10 (0.69) n= 9 3.00 (0.37) n= 24 2.99 (0.51) n= 53	2.50 (0.43) n= 9 2.78 (0.55) n= 24 2.84 (0.48) n= 53
Documented	Yes No	2.44 (0.60) n= 76 2.08 (0.95) n= 10	2.69 (0.67) n= 76 2.72 (0.72) n= 10	2.87(0.53) n= 76 2.74 (0.55) n= 10	3.05 (0.48) n= 76 2.70 (0.53) n= 10	2.79 (0.47) n= 76 2.76 (0.74) n= 10
Marital status	Single Married/ partner	**2.24 (0.65)** **n= 54** **2.68 (0.61)** **n= 31**	2.66 (0.57) n= 54 2.72 (0.44) n= 31	2.86 (0.61) n= 54 2.85 (0.36) n= 31	2.96 (0.53) n= 54 3.08 (0.43) n= 31	2.79 (0.51) n= 54 2.79 (0.50) n= 31
Household composition	Alone Close family Extended family Flat mates	**2.38 (0.58)** **n= 41** **2.66 (0.60)** **n= 29** **2.58 (1.26)** **n= 3** **1.79 (0.59)** **n= 12**	2.68 (0.54) n= 41 2.71 (0.43) n= 29 3.25(0.50) n= 3 2.54 (0.63) n= 12	2.90 (0.60) n= 41 2.89 (0.38) n= 29 3.20(0.60) n= 3 2.58 (0.54) n= 12	**3.30 (0.56)** **n= 41** **3.10 (0.41)** **n= 29** **3.10 (0.64)** **n= 3** **2.65 (0.30)** **n= 12**	2.83 (0.45) n= 41 2.76 (0.51) n= 29 3.27 (0.64) n= 3 2.60 (0.58) n= 12
Work Situation	Paying Job	**2.38 (0.69)** **n= 38**	2.64 (0.56) n= 38	2.79 (0.46) n= 38	2.95 (0.40) n= 38	2.75 (0.50) n= 38

	No paying job	**2.75 (0.57)**	2.69 (0.61)	2.73 (0.61)	3.01 (0.67)	2.79 (0.57)
		n= 22	n= 22	n= 22	n= 22	n= 22
	Student	**2.12 (0.57)**	2.76 (0.38)	3.07 (0.51)	3.08 (0.46)	2.85 (0.44)
		n= 25	n= 25	n= 25	n= 25	n= 25
Monthly income	≤ 650 €	2.39 (0.63)	2.63 (0.50)	2.83 (0.56)	3.00 (0.54)	2.77 (0.51)
		n= 55	n= 55	n= 55	n= 55	n= 55
	651 € to 999 €	2.40 (0.89)	2.78 (0.62)	2.86 (0.50)	2.94 (0.47)	2.88 (0.52)
		n= 18	n= 18	n= 18	n= 18	n= 18
	≥1000 €	2.44 (0.44)	2.83 (0.44)	2.97 (0.42)	3.10 (0.34)	2.75 (0.48)
		n= 12	n= 12	n= 12	n= 12	n= 12
Health situation	Good	2.48 (0.65)	2.74 (0.54)	2.91 (0.52)	3.07 (0.46)	2.85 (0.48)
		n= 64	n= 64	n= 64	n= 64	n= 64
	Less than good	2.17 (0.66)	2.55 (0.47)	2.70 (0.53)	2.81 (0.56)	2.61 (0.52)
		n= 21	n= 21	n= 21	n= 21	n= 21
Chronic disease	No diseases	2.36 (0.62)	2.66 (0.52)	2.87 (0.)51	3.06 (0.51)	2.76 (0.45)
		n= 62	n= 62	n= 62	n= 62	n= 62
	One or more	2.51 (0.79)	2.77 (0.52)	2.83 (0.59)	2.86 (0.44)	2.85 (0.63)
		n= 23	n= 23	n= 23	n= 23	n= 23
Length of stay in Portugal	< 1 year	2.04 (0.88)	2.75 (0.48)	2.91 (0.66)	2.91 (0.49)	2.91 (0.57)
		n= 7	n= 7	n= 7	n= 7	n= 7
	1 to 5 years	2.33 (0.61)	2.77 (0.52)	2.91 (0.56)	2.99 (0.53)	2.82 (0.53)
		n= 58	n= 58	n= 58	n= 58	n= 58
	6 to 10 years	2.71 (0.63)	2.45 (0.49)	2.68 (0.37)	3.08 (0.41)	2.67 (0.37)
		n= 21	n= 21	n= 21	n= 21	n= 21
Private insurance	Yes	2.58 (0.39)	2.85 (0.32)	2.74 (0.31)	2.88 (0.45)	2.76 (0.28)
		n= 10	n= 10	n= 10	n= 10	n= 10
	No	2.38 (0.69)	2.67 (0.54)	2.87 (0.55)	3.02 (0.50)	2.79 (0.53)
		n= 75	n= 75	n= 75	n= 75	n= 75

Understand Portuguese	Yes	2.48 (0.64) n= 49	2.67 (0.55) n= 49	2.89 (0.48) n= 49	2.99 (0.52) n= 49	2.79 (0.44) n= 49
	No	2.33 (0.66) n= 35	2.72 (0.49) n= 35	2.81 (0.61) n= 35	3.03 (0.47) n= 35	2.79 (0.59) n= 35

Table 4 Association between HLQ scores and socio-demographic characteristics (continued)

		Scale 6 (n=86)	Scale 7 (n=86)	Scale 8 (n=85)	Scale 9 (n=85)
		Mean score (SD)			
Sex	Female	3.27 (0.79) n=35	2.98 (0.52) n=35	3.51 (0.50) n=35	3.61 (0.65) n=35
	Male	3.10 (0.75) n= 51	2.96 (0.63) n= 51	3.37 (0.77) n= 50	3.36 (0.84) n= 50
Age group	18-25	3.24 (0.55) n= 10	2.93 (0.51) n= 10	3.58 (0.77) n= 10	3.18 (0.69) n= 10
	26-45	3.14 (0.78) n= 72	2.95 (0.56) n= 72	3.42 (0.66) n= 71	3.47 (0.79) n= 71
	46-65	3.25 (1.05) n= 4	3.46 (1.04) n= 4	3.25 (0.72) n= 4	4.05 (0.30) n= 4
secondary education	No	3.00 (0.93) n= 9	3.19 (0.74) n= 9	3.38 (0.55) n= 9	3.36 (0.60) n= 9
	Yes	3.23 (0.56) n= 24	2.88 (0.46) n= 24	3.43 (0.73) n= 24	3.51 (0.72) n= 24
	College or more	3.15 (0.82) n= 53	2.97 (0.60) n= 53	3.44 (0.67) n= 52	3.46 (0.83) n= 52
Documented	Yes	3.21 (0.75) n= 76	2.97 (0.58) n= 76	3.46(0.66) n= 75	**3.53 (0.75) n= 75**
	No	2.68 (0.81)	2.93 (0.61)	3.18 (0.79)	**2.94 (0.78)**

		n= 10	n= 10	n= 10	**n= 10**
Marital status	Single	**3.00 (0.80)**	2.88 (0.55)	3.42 (0.72)	3.34 (0.82)
		n= 54	n= 54	n= 53	n= 53
	Married/ partner	**3.41 (0.65)**	3.11 (0.62)	3.45 (0.60)	3.66 (0.67)
		n= 31	n= 31	n= 31	n= 31
Household composition	Alone	**3.22 (0.68)**	3.00 (0.45)	3.54 (0.61)	**3.52 (0.71)**
		n= 41	n= 41	n= 41	**n= 41**
	Close family	**3.40 (0.69)**	3.06 (0.66)	3.48 (0.59)	**3.67 (0.64)**
		n= 29	n= 29	n= 29	**n= 29**
	Extended family	**2.33 (0.50)**	3.01 (0.61)	3.00 (0.00)	**2.30 (0.42)**
		n= 3	n= 3	n= 2	**n= 2**
	Flat mates	**2.50 (0.88)**	2.61 (0.73)	2.98 (0.94)	**2.93 (0.99)**
		n= 12	n= 12	n= 12	**n= 12**
Work Situation	Paying Job	3.13 (0.76)	3.06 (0.51)	3.38 (0.69)	3.50 (0.73)
		n= 38	n= 38	n= 37	n= 37
	No paying job	3.16 (0.82)	2.97 (0.77)	3.29 (0.76)	3.23 (0.69)
		n= 22	n= 22	n= 22	n= 22
	Student	3.16 (0.78)	2.81 (0.48)	3.60 (0.54)	3.60 (0.64)
		n= 25	n= 25	n= 25	n= 25
Monthly income	≤ 650 €	3.12 (0.80)	2.91 (0.63)	3.44 (0.68)	3.44 (0.81)
		n= 55	n= 55	n= 55	n= 55
	651 € to 999 €	3.01 (0.60)	3.00 (0.40)	3.34 (0.64)	3.34 (0.74)
		n= 18	n= 18	n= 17	n= 17
	≥1000 €	3.50 (0.82)	3.14 (0.58)	3.74 (0.47)	3.70 (0.66)
		n= 12	n= 12	n= 12	n= 12
Health situation	Good	3.23 (0.74)	3.02 (0.55)	3.50 (0.65)	3.51 (0.78)
		n= 64	n= 64	n= 63	n= 63
		2.92 (0.83)	2.78 (0.66)	3.20 (0.71)	3.30 (0.78)

	Less than good	n= 21	n= 21	n= 21	n= 21
Chronic disease	No diseases	3.17 (0.72) n= 62	2.95 (0.08) n= 62	3.43 (0.68) n= 61	3.44 (0.76) n= 61
	One or more	3.10 (0.91) n= 23	3.01 (0.61) n= 23	3.41 (0.68) n= 23	3.51 (0.84) n= 23
Length of stay in Portugal	< 1 year	2.42 (0.84) n= 7	2.47 (0.77) n= 7	2.91 (0.87) n= 7	**2.54 (0.89) n= 7**
	1 to 5 years	3.20 (0.75) n= 58	3.01 (0.55) n= 58	3.47 (0.65) n= 57	**3.45 (0.70) n= 57**
	6 to 10 years	3.28 (0.68) n= 21	3.02 (0.56) n= 21	3.50 (0.60) n= 21	**3.81 (0.68) n= 21**
Private insurance	Yes	3.28 (0.92) n= 10	2.97 (0.86) n= 10	3.38 (1.06) n= 10	3.38 (1.04) n= 10
	No	3.13 (0.75) n= 75	2.96 (0.54) n= 75	3.43 (0.61) n= 74	3.47 (0.74) n= 74
Understand Portuguese	Yes	**3.33 (0.71) n= 49**	**3.09 (0.52) n= 49**	3.52 (0.64) n= 48	**3.64 (0.77) n= 48**
	No	**2.94 (0.76) n= 35**	**2.79 (0.64) n= 35**	3.31 (0.72) n= 35	**2.23 (0.74) n= 35**

Results in bold have p-value <0.05 for differences in means using ANOVA.

Table 5 shows all effect sizes (ES) of socio-demographic status across the HLQ scales. The following description includes all effect sizes for differences in means that were found to be statistically significant at $p < 0.05$ (showed in table 4).

The largest effect sizes for differences in means were seen between the different groups of household composition, Effect sizes for the observed differences across four HLQ scales ranged between large ('Ability to actively engage with healthcare providers' ES = 0.18; 'Feeling understood by healthcare providers' ES = 0.17; 'Understanding health information well enough to know what to do' ES = 0.15) to medium ('Social support for health' ES = 0.9).

Length of stay in Portugal was associated with a large effect size in the ninth scale 'Understanding health information well enough to know what to do' ES = 0.17.

Similarly, work situation was associated with medium effect size in scale 1 'feeling understood by healthcare providers' ES = 0.13.

Medium effect sizes were seen for differences in three HLQ scales according to the ability to understand and speak Portuguese, ES = 0.7 in scales 7 and 9 'Navigating the healthcare system' and 'Understanding health information well enough to know what to do' respectively, ES = 0.6 in scale 8 'Ability to find good health information'.

Marital status was associated with medium effect sizes across two HLQ scales, large ES = 0.1 in 'Feeling understood by healthcare providers', to medium 'Ability to actively engage with healthcare providers' ES = 0.06.

Medium effect size ES = 0.6 was seen in scale 9 'Understanding health information well enough to know what to do' according to the migration status.

Table 5 effect sizes (ES) of socio-demographic status across the HLQ scales

	Scale 1	Scale 2	Scale 3	Scale 4	Scale 5	Scale 6	Scale 7	Scale 8	Scale 9
Sex	0.004	0.016	0.011	0.041	0.021	0.016	0.00	0.012	0.024
Age group	0.007	0.016	0.011	0.004	0.013	0.003	0.035	0.010	0.044
secondary education	0.005	0.042	0.014	0.003	0.039	0.007	0.021	0.001	0.003
Documented	0.032	0.001	0.007	0.051	0.00	0.050	0.00	0.018	**0.062**
Marital status	**0.101**	0.002	0.00	0.013	0.00	**0.064**	0.036	0.00	0.039
Household composition	**0.173**	0.053	0.057	**0.089**	0.057	**0.183**	0.063	0.088	**0.149**
Work Situation	**0.126**	0.009	0.071	0.012	0.007	0.00	0.032	0.034	0.036
Monthly income	0.001	0.025	0.007	0.009	0.009	0.037	0.018	0.004	0.019
Health situation	0.041	0.025	0.032	0.049	0.042	0.029	0.034	0.038	0.013
Chronic disease	0.010	0.009	0.001	0.034	0.006	0.002	0.002	0.00	0.002
Length of stay in Portugal	0.088	0.070	0.037	0.009	0.022	0.082	0.064	0.054	**0.169**
Private insurance	0.009	0.012	0.007	0.009	0.00	0.004	0.00	0.001	0.001
Understand Portuguese	0.013	0.002	0.005	0.001	0.00	**0.065**	**0.062**	0.023	**0.066**

6. Discussion

This study indicates that migrants from the MENAP region in Lisbon, to the extent of the gathered sample, appear to have difficulties in navigating the Portuguese healthcare system, and in their relationships with healthcare providers. Small to large differences in health literacy levels are identifiable across socio-demographic groups. Particular groups with the largest health literacy differential, having higher scores when compared to their counterparts are migrants who are living with their close families, and those who have been in Portugal for a longer period of time. Differences were also seen according to the work situation, marital status, migration status and the ability to understand and speak Portuguese.

Having more difficulties in navigating the healthcare system is consistent with the previous results in migrants' health literacy (115,116). Adapting to a new healthcare system can be extremely difficult for migrants especially the new arrivals and those who did not spend a long period of time in the host country. Migrants of the MENAP region in Portugal, especially the new wave, face multiple barriers, coming from a considerably different culture, speaking a different language, and trying to adapt to a new healthcare system. Other studies showed that migrants in general, and the newcomers in particular, suffer from the lack of knowledge about the organization of the health care system in the host country, having different expectations about healthcare providers' role, and language barriers (116,117).

Difficulties in the relationship with healthcare providers and feeling less understood and supported by them were also shown in previous studies (118,119). This can be explained on both ends, the lack of knowledge, and mistrust of healthcare service on migrants' part, and the host country healthcare system and healthcare providers, knowing that healthcare systems are not fully prepared to deal with migrants, especially in the last decade when migration flow in general and the MENAP region migration flow in particular has risen significantly. Healthcare providers training does not normally include dealing with foreign or non-native language speakers (62), the attitude and communication style among healthcare providers can impede quality service and relationship with migrants (119). Previous studies show that the lack of information at the migrants' end, and the lack of explanation by healthcare providers about their treatment and conditions also affect their relationship, which is already hindered by language barriers (115).

Certain socio-demographic groups are known to be more vulnerable in regard to health literacy (72,120–122). In this study, groups with lower health literacy include migrants

living with flat mates and not with their close families or significant others, students, undocumented migrants, newcomers, those who do not speak and understand Portuguese. These groups reported difficulties understanding health information, navigating the healthcare system, engaging healthcare providers, feeling supported and understood by healthcare providers, and in having adequate social support for health. Such groups are known to be subject to many disparities in regard to equality of healthcare service access and health outcomes. These disadvantages can be explained, at least in part, by the identified elements of poor health literacy (56,72).

The study showed lower health literacy scores with large to medium differences for migrants who have been in Portugal for less than one year period of time, and those who do not speak and understand Portuguese. When compared with their counterparts they scored lower on scales focused on engaging healthcare providers, navigating the healthcare system, and understanding health information well enough to know what to do, large effect sizes are not common in health-related studies (123).

Such findings can be explained by the fact that recent migrants are less likely to be familiar with the new healthcare system, to have regular medical check-ups, and to have a regular medical doctor. A longer stay for migrants and a better language proficiency are associated with an increase in material goods, and with more exposure and adaptation to the sociocultural environment of the host country, thus, facilitating access to health care system (124,125).

These findings greatly concur with those of previous studies that showed that migrants with more proficiency in the language of their host country reported stronger health literacy skills (125). These studies also indicated the important role of language proficiency and longer-stay period in migrants' access to care, and health care utilization and experiences (124,125).

The study results reflect the importance of household composition and marital status, with medium to large effect sizes, in multiple domains of health literacy. When compared to migrants living alone or with their close families and married migrants, those living with flat mates or roommates and single migrants had lower scores on multiple scales including social support for health, engaging health care providers and feeling understood by them, and adequate understanding of health information. These findings could be explained by having better living conditions and more supportive environment, which lead to a better experience and access to healthcare services, and to a larger sense of social support and less vulnerability. Other studies show that having a quality social support led to improved health outcomes and better self-management

(72,126,127). Studies done by Hosking et al. (2018), Bourne et el. (2018), and Beauchamp et al. (2015) showed that people living alone had lower scores in terms of social support for health (72,128,129). However, in aforementioned studies, on the contrary of this study, it was not indicated whether people living with others were living with their families and partners, or with other different people.

Migration status had a medium effect size in respect of understanding health information well enough to know what to do. Undocumented migrants were shown to have lower scores when compared to those who are documented. Undocumented migrants, especially those who experienced a more difficult migration process, are more likely to face occupational hazards, poor work conditions, and have no health insurance, making their migration status a compromising factor of their access to health and social services (130,131). Undocumented migrants often tend not to pursue healthcare and health information because of the lack of trust in service providers and fear of detection which are common in this group, that contributes more to the barriers facing undocumented migrants in terms of health access and information (132).

Interestingly enough, education and health insurance had no significant effect on the scores of HLQ scales in the MENAP region migrants in Lisbon. The results showed that migrants who completed their secondary education, and those with private health insurance, when compared to migrants who did not complete their secondary education and those without a private health insurance, respectively, had no statistically significant differences in their scores across all scales. These findings are not consistent with the literature and in previous studies, especially among migrants, education was shown to be an important factor of migrants' health literacy (68–71). Other studies also highlighted the important effect of education and having a private health insurance in health literacy levels (72,128,129). This contradiction could be the result of a small sample size in this study where only 86 participants were recruited, and the result of differences in sizes of the subgroups of independent variables, only 10.5% of the participant did not complete secondary education. Students also reported lower scores when compared to migrants without a paying job with a medium effect size in feeling understood by healthcare providers, migrant students are known to face multiple hardships in terms of health, education, and social mobility (133).

This study showed no significant effect of age and sex on health literacy levels among migrants of the MENAP region. Both men and women, and the different age groups had relatively similar scores across all scales. Older age was shown to be associated with lower levels of health literacy in several studies (68,69,72), however, it was dependent

on the tool used to measure health literacy (69). The relationship between sex and health literacy in previous studies is less consistent, some showed no association, some studies showed lower health literacy in women when compared to men, and other showed the opposite (69,71,72,128).

In the light of current knowledge, this study is the first to explore health literacy of migrants from the MENAP region in Lisbon, and in Portugal. The use of the health literacy questionnaire provided a greatly unbiased estimate of differences of means in composite scores between the socio-demographic subgroups of the study (110). The use of effect sizes also helped to improve the understanding of associations between socio-demographic characteristics and the domains of health literacy. One of the study's limitations is the small sample size. Larger sample size could reduce the probability of errors in our results, and could be able to detect smaller effect size, and reduce uncertainty (134). It is important to acknowledge that a self-administrated questionnaire and especially on online platforms may lead to lower response rate. The absence of the interviewer when using an online questionnaire to explain and answer the participants' doubts and questions also resemble one of the limitations of this study. Another possible limitation could be the underrepresentation of migrants from the MENAP region in Lisbon, due to the nature of study population. Indeed, it was hard to reach and recruit participants even with the substantial efforts of the research team, and the population was not represented in the different organizations contacted in the study. It is important to note that migrants with low health literacy may have been less inclined to participate in the study when approached by the research team, which may have influenced the estimation of health literacy levels in study population. Further research is needed which could build upon the findings of this exploratory study, by trying to include a larger sample, whether in terms of numbers or including different regions of Portugal and not only Lisbon. Future studies can also address the effects of COVID-19 pandemic on migrants' health literacy and access to healthcare in Portugal.

As the flow of migration continues to grow, the investigation of migrants' health literacy becomes more important to researchers, healthcare providers, and policy makers. The study findings provide insight to key areas of health literacy needs of the new wave of migrants of the MENAP region in Lisbon, in which migrants can be supported to access, understand, and use health information. The exploration and identification of areas of difficulty, in particular for socio-demographic groups of migrants, make these findings highly relevant for possible future interventions, that aim to promote migrant's health outcomes, and reduce existing health inequalities. Potential strategies for interventions could include better methods of information delivery, and the use of navigators to

address the difficulties that migrants from the MENAP region have in navigating the Portuguese healthcare system, as it can be beneficial in supporting them through the system, especially those with different cultural and demographic characteristics (135,136). Another strategy could be the use of professional interpreters to overcome the language barriers, which is known to be important, yet underused in healthcare settings (137,138). Findings are particularly relevant for both public healthcare sector and private organizations aiming to improve migrants' access to healthcare, their quality of life, and their experience in navigating the Portuguese healthcare system, especially those who arrived recently, undocumented, do not speak and understand Portuguese, and those not living with their close families.

7. Conclusion

With the continuous growth of migrant population in Portugal especially migrants form the MENAP region, it becomes imperative to study and examine health literacy among them, not only to improve their health outcomes, but also to prevent the health care system of getting overburdened when dealing with such growth, as health literacy was shown to have a great impact on health outcomes and health care system. Only few studies have been done to assess health literacy and health literacy needs among migrants in Portugal. This study was the first to explore health literacy among migrants from the MENAP region in Lisbon.

We used the HLQ to describe the health literacy profile of the gathered sample of migrants, and to identify their health literacy strengths and difficulties. Mean scores varied across the nine HLQ scales indicating that migrants in this study have strengths and difficulties of different aspects of health literacy, in particular they have more difficulties in navigating the Portuguese healthcare system, and in the relationship with healthcare providers. We report associations between lower health literacy and socio-demographic characteristics including lower Portuguese proficiency, shorter period of stay in Portugal, not having the legal documentation, and not living with a close family. Unlike previous studies, age, sex, and education did not have an association with health literacy. This study provides key insights to health literacy needs and challenges among migrants from the MENAP region in Lisbon, and relevant findings for guidance in future public health strategies and interventions. Further research preferably in larger samples is required to better understand the relationship between socio-demographic characteristics and health literacy in this group of migrants.

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