DETERMINANTS OF MOTHER-BABY RELATIONSHIP EVALUATED DURING PREGNANCY

by

Maria Teresa Pinto Esteves Maia Correia

Thesis submitted to Escola Nacional de Saúde Pública
Universidade Nova de Lisboa

In partial fulfilment of the requirements for the degree of Doctor of Philosophy in Public Health - Health Promotion

Supervisors: Prof. Isabel Loureiro and Prof. Clemens Hosman

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Supervisors
Prof. Maria Isabel Loureiro
Prof. Clemens Hosman

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To my parents

To Rui, André e Ana

With them I feel the continuity of a secure and magic attachment
They are the happiness of my life
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Teresa Maia
June, 2014
ABSTRACT
ABSTRACT

Background

Mental health promotion is supported by a strong body of knowledge and is a matter of public health with the potential of a large impact on society. Mental health promotion programs should be implemented as soon as possible in life, preferably starting during pregnancy. Programs should focus on malleable determinants, introducing strategies to reduce risk factors or their impact on mother and child, and also on strengthening protective factors to increase resilience. The ambition of early detecting risk situations requires the development and use of tools to assess risk, and the creation of a responsive network of services based in primary health care, especially maternal consultation during pregnancy and the first months of the born child. The number of risk factors and the way they interact and are buffered by protective factors are relevant for the final impact.

Maternal-fetal attachment (MFA) is not yet a totally understood and well operationalized concept. Methodological problems limit the comparison of data as many studies used small size samples, had an exploratory character or used different selection criteria and different measures. There is still a lack of studies in high risk populations evaluating the consequences of a weak MFA. Instead, the available studies are not very conclusive, but suggest that social support, anxiety and depression, self-esteem and self-control and sense of coherence are correlated with MFA. MFA is also correlated with health practices during pregnancy, that influence pregnancy and baby outcomes. MFA seems a relevant concept for the future mother baby interaction, but more studies are needed to clarify the concept and its operationalization.

Attachment is a strong scientific concept with multiple implications for future child development, personality and relationship with others. Secure attachment is considered an essential basis of good mental health, and promoting mother-baby interaction offers an excellent opportunity to intervention programmes targeted at enhancing mental health and well-being. Understanding the process of attachment and intervening to improve attachment requires a comprehension of more proximal factors, but also a broader approach that assesses the impact of more distal social conditions on attachment and how this social impact is mediated by family functioning and mother-baby interaction. Finally, it is essential to understand how this knowledge could be translated in effective mental health promoting interventions and measures that could reach large populations of pregnant mothers and families. Strengthening emotional availability (EA) seems to be a relevant approach to improve the mother-baby relationship.

In this review we have offered evidence suggesting a range of determinants of mother-infant relationship, including age, marital relationship, social disadvantages, migration, parental psychiatric disorders and the situations of abuse or neglect.

Based on this theoretical background we constructed a theoretical model that included proximal and distal factors, risk and protective factors, including variables related to the mother, the father, their social support and mother baby interaction from early pregnancy until six months after birth. We selected the Antenatal Psychosocial Health Assessment (ALPHA) for use as an instrument to detect psychosocial risk during pregnancy.

Method

Ninety two pregnant women were recruited from the Maternal Health Consultation in Primary Health Care (PHC) at Amadora. They had three moments of assessment: at T1 (until 12 weeks of pregnancy) they filled out a questionnaire that included socio-demographic data, ALPHA, Edinburgh post-natal Depression Scale (EDPS), General Health Questionnaire (GHQ) and Sense of Coherence (SOC); at T2 (after the 20th weeks of pregnancy) they answered EDPS, SOC and MFA Scale (MFAS), and finally at T3 (6 months after birth), they repeated EDPS and SOC, and their interaction with their babies was videotaped and later evaluated using EA Scales.
A statistical analysis has been done using descriptive statistics, correlation analysis, univariate logistic regression and multiple linear regression.

**Results**

The study has increased our knowledge on this particular population living in a multicultural, suburb community. It allow us to identify specific groups with a higher level of psychosocial risk, such as single or divorced women, young couples, mothers with a low level of education and those who are depressed or have a low SOC.

The hypothesis that psychosocial risk is directly correlated with MFAS and that MFA is directly correlated with EA was not confirmed, neither the correlation between prenatal psychosocial risk and mother-baby EA.

The study identified depression as a relevant risk factor in pregnancy and its higher prevalence in single or divorced women, immigrants and in those who have a higher global psychosocial risk. Depressed women have a poor MFA, and a lower structuring capacity and a higher hostility to their babies. In average, depression seems to reduce among pregnant women in the second part of their pregnancy.

The children of immigrant mothers show a lower level of responsiveness to their mothers what could be transmitted through depression, as immigrant mothers have a higher risk of depression in the beginning of pregnancy and six months after birth. Young mothers have a low MFA and are more intrusive. Women who have a higher level of education are more sensitive and their babies showed to be more responsive. Women who are or have been submitted to abuse were found to have a higher level of MFA but their babies are less responsive to them.

The study highlights the relevance of SOC as a potential protective factor while it is strongly and negatively related with a wide range of risk factors and mental health outcomes especially depression before, during and after pregnancy.

**Conclusions**

ALPHA proved to be a valid, feasible and reliable instrument to Primary Health Care (PHC) that can be used as a total sum score. We could not prove the association between psychosocial risk factors and MFA, neither between MFA and EA, or between psychosocial risk and EA. Depression and SOC seems to have a clear and opposite relevance on this process.

Pregnancy can be considered as a maturational process and an opportunity to change, where adaptation processes occur, buffering risk, decreasing depression and increasing SOC.

Further research is necessary to better understand interactions between variables and also to clarify a better operationalization of MFA.

We recommend the use of ALPHA, SOC and EDPS in early pregnancy as a way of identifying more vulnerable women that will require additional interventions and support in order to decrease risk.

At political level we recommend the reinforcement of Immigrant integration and the increment of education in women. We recommend more focus in health care and public health in mental health condition and psychosocial risk of specific groups at high risk. In PHC special attention should be paid to pregnant women who are single or divorced, very young, low educated and to immigrant mothers.

This study provides the basis for an intervention programme for this population, that aims to reduce broad spectrum risk factors and to promote Mental Health in women who become pregnant. Health and mental health policies should facilitate the implementation of the suggested measures.

**Key-words:** psychosocial risk assessment, mental health promotion, maternal-fetal attachment, mother-baby interaction, emotional availability
RESUMO

Enquadramento teórico
A Promoção da saúde mental é hoje um campo de vasto interesse científico, devendo ser considerada uma questão de saúde pública e de grande impacto em termos sociais. Os Programas de promoção da saúde mental devem ser precocemente implementados de preferência ainda durante a gravidez. Devem ter como alvo, determinantes maleáveis, introduzindo estratégias para a redução de fatores de risco ou do seu impacto, e para o reforço de factores protectores aumentando a resiliência. A deteção precoce de situações de risco requer o desenvolvimento e utilização de instrumentos específicos, bem como a criação de uma rede de serviços baseada nos cuidados de saúde primários, sobretudo na consulta materna, durante a gravidez e primeiros meses da criança. O número de fatores de risco e a forma como interagem, assim como os factores protectores existentes são determinantes para o balanço que determina o resultado final.

A Ligação materno-fetal (LMF) não é ainda um conceito totalmente compreendido, levantando-se várias questões em relação à sua operacionalização numa escala. Uma série de aspectos metodológicos têm dificultado a comparação de dados já que muitos estudos utilizaram amostras pequenas, diferiram nos critérios de selecção e nos instrumentos utilizados ou eram apenas estudos de carácter exploratório. São também escassos os estudos realizados com o objectivo de avaliar as consequências de uma fraca LMF em populações de risco. No entanto, apesar de as revisões não serem conclusivas, vários autores sugerem que o apoio social, a ansiedade, a depressão, a auto-estima, o auto-controle e o sentido de coerência estarão relacionados com a LMF. Esta está também relacionada com a adoção de comportamentos de saúde pela grávida, que irão influenciar o curso da própria gravidez e a saúde futura do bebé. A LMF parece ser um preditor relevante para a futura interação mãe-bebé, mas são necessários mais estudos que clarifiquem este conceito e a sua operacionalização.

A Teoria da Vinculação constitui-se como um corpo científico robusto, com múltiplas implicações para o desenvolvimento infantil, para a estruturação da personalidade da criança e da sua capacidade de relacionamento com os outros. Uma vinculação segura é essencial para uma boa saúde mental e a promoção de uma dequadainteracção mãe-bebé parece ser uma excelente estratégia nos programas de intervenção que têm como objectivo a promoção da saúde mental. Compreender o processo de vinculação e intervir de forma a promover a sua segurança, implica por um lado conhecer os factores proximais que têm a ver directamente com a interacção mãe-bebé, e por outro ter também uma visão mais ampla, que avalie o impacto de factores sociais mais distais e a forma como o seu impacto é mediado na relação entre mãe e bebé. Finalmente, é essencial entender de que forma este conhecimento pode ser aplicado em programas de promoção de saúde mental eficazes (e que instrumentos devem ser utilizados), que possam envolver um grande número de grávidas e suas famílias. A promoção da disponibilidade emocional (DE) parece ser uma abordagem relevante para melhorar a relação mãe-bebé.

Uma série de trabalhos científicos identificam como principais factores identificados na gravidez e determinantes da relação mãe-bebé, a idade materna, a relação conjugal, a migração, a existência de dificuldades sociais ou transtornos psiquiátricos dos pais e ainda as situações de abuso ou negligência.

Com base na revisão teórica realizada, construímos um modelo teórico que incluiu factores proximais e distais, factores de risco e de protecção, incluindo variáveis relacionadas com a mãe, o pai, o suporte psicossocial e a interacção mãe-bebé, desde o início da gravidez até aos seis meses de idade do bebé. Como instrumento para avaliação do risco psicossocial durante a gravidez seleccionámos a Antenatal Psychosocial Health Assessment (ALPHA).

XIII
Metodologia

Noventa e duas mulheres grávidas foram recrutadas da consulta de saúde materna no Agrupamento de Centros de Saúde da Amadora. A avaliação decorreu em três momentos: T1 (até às 12 semanas de gravidez) sendo utilizados um questionário para recolha de dados sociodemográficos, o ALPHA, a Edinburgh pós-natal Depression Scale (EDPS), a General Health Questionnaire (GHQ) e o Senso de Coerência (SOC); em T2 (após as 20 semanas de gravidez) foi aplicado a EDPS, o SOC e a escala de Ligação Materno-Fetal (MFAS) e finalmente T3 (6 meses após o nascimento), foi repetida a aplicação da EDPS e SOC, sendo também filmada a interacção mãe-bebé que foi depois codificada com as Emotional Availability Scales (EAS).

O tratamento estatístico foi realizado através da análise descritiva, análise de correlações, regressão logística univariada e regressão linear múltipla.

Resultados

Este estudo permitiu-nos aumentar o conhecimento sobre esta população multicultural e suburban, e identificar grupos específicos com maior risco psicossocial, como é o caso das mulheres solteiras ou divorciadas, de jovens casais, mães com baixo nível de escolaridade, assim como de mulheres deprimidas ou que apresentam um baixo sentindo de coerência.

Não se confirmou a hipótese de que o risco psicossocial esteja diretamente relacionada com a LMF e que esta esteja diretamente relacionada com a DE. Também não foi confirmada a hipótese de que o risco psicossocial pré-natal está associado a dificuldades na interacção mãe-bebé.

O estudo identificou a depressão como um fator de risco relevante na gravidez e a sua maior prevalência em mulheres solteiras ou divorciadas, imigrantes e naquelas que têm um maior risco psicossocial em geral. Demonstrou-se que as mulheres deprimidas têm uma menor LMF, assim como uma menor capacidade de estruturação e uma maior hostilidade para com os seus bebés. Parece haver uma diminuição da prevalência de depressão na segunda metade da gravidez.

Os filhos de mães imigrantes demonstraram uma menor capacidade de resposta em relação às suas mães, o que pode eventualmente ser mediado pela depressão, já que as mães imigrantes têm um maior risco de depressão no início da gravidez e seis meses após o nascimento. As mães mais jovens têm uma menor LMF e são mais invasivas na interacção com os bebés. As mulheres com maior escolaridade demonstraram maior sensibilidade em relação aos seus filhos, os quais por sua vez parecem ter maior capacidade de responder às suas interações. As mulheres que são ou foram submetidas a violência, demonstraram ter maior LMF, mas os seus filhos têm menor capacidade de resposta à interacção.

O estudo destaca a relevância do sentido de coerência como um potencial fator protector já que apresenta uma forte correlação negativa com uma série de fatores de risco psicossocial, e com problemas de saúde mental, particularmente com depressão antes, durante e após a gravidez.

Conclusões

O ALPHA demonstrou ser um instrumento válido e exequível e fiável para utilização nos Cuidados de Saúde Primários (CSP), podendo ser também utilizado como um score total traduzindo a soma dos vários itens.

Não foi provada a associação entre o nível de risco psicossocial e a LMF, nem entre a LMF e a DE, ou ainda entre o risco psicossocial e a DE. A depressão e o SOC parecem ser factores muito relevantes com uma influência oposta. A gravidez deve ser considerada como um processo de amadurecimento e uma oportunidade de mudança, em que ocorrem processos adaptativos que podem atenuar factores de risco, tendo como resultado a diminuição da depressão e o aumento do sentido de coerência. Para uma melhor compreensão das interações entre variáveis e uma melhor operationalização da LMF são necessários mais estudos.
Recomendamos o uso de ALPHA, SOC e EDPS no início da gravidez, como uma forma de identificar as mulheres mais vulneráveis e que necessitam de intervenções e apoio específicos, a fim de diminuir o risco a que estão associadas.

A nível político, propomos o reforço da integração de imigrantes e incremento do nível de escolaridade nas mulheres. Recomendamos também um maior enfoque nos cuidados de saúde e na abordagem em saúde pública de grupos específicos da população com maior risco psicossocial e maior vulnerabilidade emocional. A nível dos CSP maior atenção deve ser dada às mulheres grávidas que são solteiras ou divorciadas, às muito jovens, com baixo nível de escolaridade e às imigrantes.

Este estudo estabelece a base para um programa de intervenção com esta população, tendo como objetivo reduzir fatores de risco num espectro alargado, assim como promover a saúde mental em mulheres que engravidam. As políticas de saúde e de saúde mental deverão facilitar a implementação das medidas que são propostas.

**Palavras – chave:** avaliação de risco psicossocial, promoção da saúde mental, ligação materno-fetal, interacção mãe-bebé, disponibilidade emocional
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<tr>
<td>AAI</td>
<td>Adult Attachment Interview</td>
</tr>
<tr>
<td>ACES</td>
<td>Agrupamento de Centros de Saúde</td>
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<tr>
<td>ADHD</td>
<td>Attention Deficit and Hiperactivity Disorder</td>
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<td>ALPHA</td>
<td>Antenatal Psychosocial Health Assessment</td>
</tr>
<tr>
<td>ALPHA M</td>
<td>Antenatal Psychosocial Health Assessment – subgroup of maternal factors</td>
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<td>ALPHA F</td>
<td>Antenatal Psychosocial Health Assessment – subgroup of family factors</td>
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<tr>
<td>ALPHA SA</td>
<td>Antenatal Psychosocial Health Assessment – subgroup of family violence</td>
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<tr>
<td>Total ALPHA</td>
<td>Antenatal Psychosocial Health Assessment – Total score</td>
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<tr>
<td>ACTH</td>
<td>ACTH – Adrenocorticotropic hormone</td>
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<tr>
<td>ARSLVT</td>
<td>ARSLVT – Administração Regional de Saúde de Lisboa e Vale do Tejo</td>
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<tr>
<td>DALY</td>
<td>Disability adjusted life years</td>
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<td>EA</td>
<td>Emotional availability</td>
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<td>EAS</td>
<td>Emotional availability scales</td>
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<td>EDPS</td>
<td>Edinburgh Postnatal Depression Scale</td>
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<td>GHQ</td>
<td>General Health questionnaire</td>
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<td>GHQ C</td>
<td>General Health questionnaire likert</td>
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<td>GHQ LIK</td>
<td>General Health questionnaire corrected</td>
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<td>GHQ org</td>
<td>General Health questionnaire original</td>
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<tr>
<td>HFF</td>
<td>Hospital Fernando Fonseca</td>
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<tr>
<td>HIV</td>
<td>Human immunodeficiency virus</td>
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<tr>
<td>HPA axis</td>
<td>Hypothalamic–pituitary – adrenal axis</td>
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<tr>
<td>HPV</td>
<td>Human Papiloma virus</td>
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<tr>
<td>INE</td>
<td>Instituto Nacional de Estatística</td>
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<tr>
<td>MFA</td>
<td>Maternal-fetal attachment</td>
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<tr>
<td>MFAS</td>
<td>Maternal-fetal attachment scale</td>
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<tr>
<td>MHP</td>
<td>Mental Health Promotion</td>
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<td>MM</td>
<td>Mind-mindedness</td>
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<td>PHC</td>
<td>Primary Health Care</td>
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<td>RF</td>
<td>Reflective Function</td>
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<td>SOC</td>
<td>Sense of coherence</td>
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<td>SS</td>
<td>Strange Situation</td>
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<td>UCF</td>
<td>Unidade Coordenadora Funcional</td>
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<td>WHO</td>
<td>World Health Organization</td>
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INTRODUCTION
Theoretical framework
INTRODUCTION

My interest in this field began long time ago when I was a psychiatry resident integrated in a team led by Prof. João Sennfelt, who was also Professor at Escola Nacional de Saúde Pública. Twenty five years ago this team developed an innovative and stimulating work of consultation with the Primary Health Care professionals at Sintra that had an enormous influence on me. The treatment of mental health disorders was integrated with Primary Health Care and we were also interested in mental health promotion and more specifically in developing a mental health promotion program for pregnant woman, looking for a tool to identify risk factors in pregnancy.

As a psychiatrist and psychotherapist I studied and was interested in the way mother and child establish a particular and intimate relationship that will be the basis for the child own psychological identity construct. I was interested in understanding what conscient and unconscient mechanisms provide the basis for this bonding relationship, and how could we help a mother in this marvellous but not always easy process.

Later I was invited to teach at Escola Nacional de Saúde Pública of Lisbon and I had the opportunity to collaborate in a very positive and challenging action-research project in primary health care coordinated by Prof Isabel Loureiro (Loureiro et al 2009; Loureiro et al 2009 a), focused on mental health promotion during the perinatal period. This programme pointed at the relevance of early detecting risk during maternal consultation, in order to implement timely preventive and promotion actions.

Finally at Barcelona I met Prof Clemens Hosman lecturing a course on Mental Health Promotion and was impressed by his solid scientific knowledge and contagious enthusiasm, which reinforced my wish of choosing Mental health promotion in pregnancy and early detection of risk as the theme of my thesis. I also decided that Prof Clemens Hosman and Prof Isabel Loureiro would be my both supervisors, joining Public Health and Psychology, in a shared and fruitful vision about Mental Health Promotion.

The option of choosing the Municipality of Amadora to develop the present study emerged naturally, as I develop my clinical activity as a psychiatrist at Hospital Fernando Fonseca, the local hospital of this region.

The Psychiatry Service of Hospital Fernando Fonseca is characterized by a strong community intervention approach and a close relationship with Primary Health Care, Municipalities, schools, and with the nongovernmental organizations that work in this area. Through this we have a close knowledge of the difficulties and strengths of this population and also of the existing health and communities structures. It’s a region with particular social and cultural characteristics and a high risk population who hardly is able to adapt to their difficult circumstances but also with a strong local network with who we collaborate closely.
Theoretical framework

This thesis closes a circle of interests and people that have contributed to what I am as a psychiatrist, teacher and researcher, and responds to a desire of intervening as early as possible in the developmental trajectories of mental and parental problems in order to contribute to a better mental health and social future of the pregnant women and their children in this region.

According to the last definition of World Health Organization, Health is defined as the capacity to adapt, what is in line with the concept of sense of coherence (Antonovsky, 1979, 1987) that also focus on the ability to adapt to life events. Health is understood as a bio-psycho-social, dynamic, complex and multidimensional process. The salutogenic model goes beyond the classical model of risk factors, by including also psychosocial and environmental determinants and the combined effect of risk and protective factors, with the focus on sense of coherence.

In recent years there has been a growing interest on pregnancy and motherhood, as periods of great relevance and opportunity for mother and child mental health promotion. Throughout Europe, specific programs have been created, improving the possibility of parents to establish a stable and secure attachment with their children, promoting a child healthy development.

To implement health promotion programs for pregnant women, services organization is of great importance, in order to create a network that allows the articulation and intervention of various partners in an integrated manner. These services should be located in Primary Health Care, where it’s possible to define a universal or selective approach, and implement strategies that can mitigate the effect of risk factors or reinforce protective factors.

To develop effective parent education programs, it is fundamental to research which are the predictors of good parent-child interaction, how this bonding is established, what its impact is and to what extent these factors are malleable. There is also a great interest in the development of standardized instruments for risk assessment (Jane-Lopis et al 2005). In addition to the need of detecting risk factors, it is also important to identify protective factors, which buffer the effect of risk factors, and increase resilience.

According to the Ecological Model proposed by Belsky and Fearon (2008) parenting is directly influenced by forces emanating from three determinant domains: the individual parent (personality); the individual child (child characteristics of individuality); and from a broader social context in which the parent-child relationship is embedded, specifically, marital relations, social networks and occupational experiences of parents. All these factors affect parenting, and in turn, child development. Stroufe and Rutter (1984) contributed to this model, postulating the relevance of the balance of risk and protective factors in a developmental psychopathology perspective.

A central point in this perspective is that “distal” influences (less distant like personality, or more distant like social support and social stressors), exert most of their effects on the child by
Theoretical framework

influencing proximal processes of parent-child interaction. This influence can be through a mediation role, and /or a moderation process.

If Attachment theory is essentially a theory of micro processes of development, emphasizing the daily interactional exchanges between parent and child and the developing of internal working models on the children the ecological /socio-contextual perspective draws attention to contextual factors and processes likely to influence these micro developmental processes. According to Beslky and Fearon (2008), all these factors have also to be put in context, as they do not operate in an isolated way and so we need to consider stress and supports, risk and protective factors simultaneously (Belsky 1984, Belsky &Isabella, 1988, Sroufe & Rutter, 1984). Data shows that not a single distal psychological and social-contextual factor individually distinguished secure and insecure attachment, but only when severe indices were considered collectively (Belsky & Isabella, 1988). The more indicators exist that put a family and a specific parent-infant dyad at risk (due to lower levels of parental psychological adjustment, poor marital /couple relationship quality, more negative and less positive parent-child interaction, less social support, more work-family stress, or lower socioeconomical situation), the more likely infant-mother and infant-father relationships were to be insecure (Belsky, 1996, Belsky, Rosenberg & Crnic,1995). Belsky and Fearon (2008) conclude that the processes of mediation should be central to our understanding of individual differences in attachment (distal factors →Parent-child interaction→attachment security) but that we should also give relevance to the moderator ones. She says that her ultimate goal was to link distal forces (social network, maternal personality, marital relationship) to proximal factors (present mother-infant interaction) to security of attachment.

The new forms of social organization, implying changes in family and cultural structure, with subsequent deficits in inter-generation support, as well as issues related to migration, urbanism and social isolation, create growing challenges to the task of being a mother. The growing number of single parents and teenage mothers, the problems related with psychiatric disorders during pregnancy and the severe and silent problem of abuse and neglect pose new challenges, not always easy to overcome. It’s essential that we can identify specific groups of pregnant women that are particularly vulnerable.

The Ottawa Charter (WHO 1986) on health promotion advocates the creation of supportive environments, emphasizing a social-ecological approach to health, promoting changes at home and community, and controlling and modifying the determinants of health. In this perspective, social changes are valued as a way to promote mental health.

As will be explained, we intend with this study to better understand the characteristics, and the risk and protective factors of these pregnant women, and to adopt a valid instrument to detect
Theoretical framework

psychosocial risk for regular use in maternal consultation. Such an assessment tool would allow clinicians to identify women at higher risk to whom they should offer tailored preventive or treatment strategies.

The theoretical model of this study includes both proximal and distal factors as suggested by Belsky, and will try to understand how distal factors like socio-demographic conditions or psychosocial risk (that make these women more vulnerable), can influence more proximal factors in mother-baby relationship.

Our ultimate goal is to contribute to a better mental health of these mothers and babies in a high risk population.

In our opinion, improving mother-baby relationship, taking together distal and proximal factors, detecting risk and implementing early strategies based in a comprehensive network of Services is a question of Public Health. Therefore, this thesis should be considered as a contribution to Public Mental Health.

The present study is organized in two parts. In Part I, we will proceed a literature review, describing the main contributes and references that are relevant to the construction of the theoretical model that will be the basis for our empirical study, namely Mental Health, Mental Health Promotion, Maternal-Fetal Attachment and Attachment and Emotional Availability. Special attention will be given to the positive and protective role of Sense of Coherence in relation to the above mentioned variables. We will present the Theoretical Model and the Antenatal Psychosocial Health Assessment, the selected tool that will be used in this study for assessing psychosocial risk among pregnant women.

In Part II we will present the Original Research. Beginning with characterizing the population where the study occurred, we will proceed describing the interest and aims of the study, the hypotheses and research questions. Next, we will describe the research methodology, the obtained results and discuss their meaning. We will finally present conclusions and recommendations.
PART I

THEORETICAL FRAMEWORK
Theoretical framework
Theoretical framework

For the construction of the theoretical framework model of this study, a theoretical review has been made, involving the main themes of interest. These themes will constitute the major building stones of the theoretical model we have designed.

1. Mental Health
2. Maternal-fetal attachment
3. Attachment and emotional availability
4. Psychosocial determinants of mother-baby relationship
5. The Antenatal Psychosocial Health Assessment - ALPHA
6. The Theoretical Model
PART I
THEORETICAL FRAMEWORK

CHAPTER I
MENTAL HEALTH
1. MENTAL HEALTH

1.1. What is mental health

1.1.1. General considerations
1.1.2. Positive mental health
1.1.3. Mental health functional model
1.1.4. Salutogenic model and sense of coherence

1.2. The burden of mental disorders

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1.4. Mental health determinants

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1.4.3. Social, environmental and economic determinants
1.4.4. Interaction between risk and protective factors
1.4.4.1. Sequential effect
1.4.4.2. Addictive and exponential effect
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1.4.4.4. Sensitive periods
1.4.5. Studies about the interaction of several determinants
1.4.6. Clusters comorbility

1.5. Intervention strategies in women, maternity and early childhood

1.6. The relevance of detecting risk in maternal consultation
The need of an Instrument to access risk in primary health care

1.7. Conclusions
Theoretical framework
1. MENTAL HEALTH

1.1. What is mental health

1.1.1. General considerations

Several models and definitions of mental health have been developed along the last decades, intending to reach to a unanimous concept that allows the researchers to operationalize and quantify it.

The concept of mental health is an integrative part of a more global concept of Health, which has changed and evolved over the last decades. Traditionally, Health has been first defined as “the absence of disease”, but this definition was quickly replaced by the concept introduced by the WHO in 1948, in which Health was described as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” However, this definition was clearly incomplete, and unsatisfactory, and recently a new concept was proposed, emphasizing the adaptative component of Health, describing it as “an ability to adapt and to self-manage, when life is facing people with physical, emotional and social challenges” (Huber et al 2011).

According with Loureiro and Miranda (2010), the concept of Health underlies a dynamic perspective, translated in the permanent pursuit of equilibrium and synergy between the different factors that are the determinants of Health.

In the same direction, mental health was redefined as “a state of well-being in which an individual is aware of its abilities, can cope with stressors of life, can work productively and can contribute to his community. In this positive assumption, mental health constitutes the foundation for the individual well-being and for an effective functioning of a community (WHO, 2010).

A clarification of the differences and inter-relationship between the concepts of mental health and mental disease is mandatory. According to Hosman (1997), there are four ways of conceptualizing this relationship: the traditional medical model, where mental health is only understood as the absence of disease, like the first cited definition of health; the dimensional medical model, where health and disease are understood in a continuously dimension, without a clear demarcation between the two concepts, also not allowing a clear distinction between mental health promotion or mental disease prevention; the positive mental health model which has been recently studied by Seligman et al (2005) and Keyes (2007); and finally the mental health functional model described by Hosman (1997a, 1997b) and Lavikainen, Lahtinen and Lehtinen (2001), the most complete, integrative and useful model for planning intervention on mental diseases prevention or on mental health promotion.
1.1.2. Positive mental health

Positive mental health should be understood as a value in itself. As it was said before, when we refer to mental health, it is important to conceptualize it as positive dimension and not merely as the absence of disease. It is a capital to adaptation, a capital that we can promote. According to Jané – Lopis et al (2005), citing Hosman (1997) and the WHO (2001), the concept of positive mental health refers to human qualities and life skills such as cognitive functioning, self-esteem, social skills, problem solving skills and the ability to cope with major changes and adverse situations; contributes to individual well-being and quality of life; and also values the ability to influence social environment and to work productively and with pleasure, contributing to the community, improving social functioning and social capital. It also includes optimism, sense of control and sense of coherence. Mental health is an integral part of overall health, and reflects a balance between the individual and his environment; corresponds to a state of emotional, psychological and spiritual well-being.

Many authors have contributed to the reflection of what is positive mental health, enriching its comprehensibility, and operationalization. In a summary report of the World Health Organization about mental health promotion (WHO 2004), the editors mention the contributes of Jahoda (1958) as the author of the cultural model of positive mental health, of Leighton and Murphy (1987) with the development of a personality theory-based concept of mental health, of Bradburn and Caplovitz (1965) with the constructs that values the affective dimension in particular well-being, of Antonovsky with the salutogenic model, of Rutter (1985) with the concept of resilience, the psychoanalytic approach and also the approach through quality of life. A model that is particularly interesting to mental health comprehension and operationalization, and that will be used in this study, is the salutogenic model developed by Antonovsky.

All of them emphasize different aspects of mental health, appealing to an integrative conceptualization.

1.1.3. The Mental health functional model

In the mental health functional model (figure 1.1), mental health should be understood as a cluster of psychological resources and skills that people need for their well-being, to develop mentally and physically along life, to have a satisfying and productive life in the fields of health, love, school, work, parenthood, to be able to deal with stressors and with life challenges, and reduce the risk of negative impacts such as mental illness, physical or other serious problems (Lavikainen, Lahtinen & Lehtinen, 2001). The model differentiates the internal dimensions of mental health, from the external dimensions, which relates to the ability to interact with the environment. According to this model, mental health is a dynamic concept that clarifies in
which type of determinants we can intervene (individual resources, or social resources), in
order to achieve the finally targeted outcomes. This model supports the theoretical background
of various types of preventive intervention programs, that aim to decrease the level or impact of
risk factors or/and to strengthen protective factors (enhancing individual skills and enhancing
social support), and to enable the individual to have the best answer, the best capacity to cope
with a specific trigger factor.

Figure I.1- The mental health functional model (Lavikainen, Lahtinen & Lehtinen, 2001)

1.1.4. Salutogenic model and Sense of coherence

The salutogenic model and the concept of sense of coherence (SOC) were developed by
Holocaust survivors, and has been widely used in the World, but specially studied and
developed by the Nordic School of Public Health (Linsdtrom & Eriksson, 2005). Sense of
coherence is an interesting and useful concept, for clinical practice and also for research as it
is operationalized as a scale.

The salutogenic model fits in a positive mental health perspective, describing how an
individual, through a series of personality traits, handles with stress situations. Relevant to this
conceptualization, is the fact that Antonovsky believed that healthy individuals with a good
sense of coherence, look for challenging situations that contributes to their development.
According to Antonovsky (1984) the SOC involves three dimensions:
Theoretical framework

- **Comprehensibility** that refers to the extent to which individuals perceive the stimuli that confront them, as making cognitive sense, and as leading to information that is ordered, consistent, structured, clear and predictable. The opposite would be noisy, chaotic, disordered, random, accidental and unpredictable.

- **Manageability** that refers to the extent to which people perceive that resources are at their disposal, are adequate to meet the demands posed by stimuli. When people are high in manageability, meaning that they have the sense that, aided by their own resources or by those of legitimate others, they will be able to cope. They won't have the feeling of being victimized by life, or of being treated in an unfairly way.

- **Meaningfulness** refers to the emotional part of comprehensibility. People who are high on this dimension, feel that life makes sense emotionally, that at least some of the problems and demands posed by life are worth investing energy in, are worthy of commitment and engagement, and are challenges that are welcome rather than burdens that they would much rather do without.

Bengel Strittmatter and Willmann (1999) cited by Loureiro and Miranda (2010), explained that for Antonovsky, the generalised resistance resources are closely related with individual characteristics (like intelligence, adaptative strategies) and with cultural factors like social support, income or cultural identity.

The individual can reinforce his SOC through action, using these generalised resistance resources. If the capacity of managing the situation is broken, a disruption in homeostasis can occur, increasing the risk of disease.

A systematic review highlighted that SOC is strongly related to perceived health, in particularly to mental health (Erikson & Linstrom, 2006). This relation in constant and independent of other factors like age, sex, ethnicity and nationality. They conclude that SOC is an important predictor of health but does not explain alone the overall health.

Several studies demonstrated the clear positive relationship between SOC and factors related to mental health such as self-esteem, locus of control, resilience (Johnson, 2004), optimism, self-efficacy, mastery and social skills. On the contrary, anxiety and depression are negatively related with SOC (Chumbler, Grimm, Cody & Beck, 2003).

A large study with 20,921 men and women in Cambridge, studied the relation between SOC, stress adaptive capacity and mortality, and proved that individuals with low SOC reported significantly lower adaptation capacity to the adverse effects of their event experiences, when compared with those who had a strong SOC. The study also proved that the individuals with less stress adaptive capacity had an increased risk of mortality. So, they concluded that SOC is a potential marker of social stress adaptive capacity, which is in fact predictive of mortality (Surtees, Wainwright & Khawn, 2006).

In another systematic review (Erikson & Linstrom, 2007), the authors concluded that SOC is a health resource, that influence quality of life, being a predictive factor for a good quality of life.
As pregnancy and delivery are important stressful events in the life of women, both physically and psychosocially, that requires the capacity to cope with multiple stressors, SOC is an interesting and useful concept to evaluate how women manage it. As Antonovsk said “the greater the stressor load, the more important the role of salutary factors” (Antonovsky, 1990). Developing this area of study, researchers demonstrated that the stronger predictors of well-being during pregnancy were the level of well-being at the beginning of pregnancy and the women’s degree of SOC. A high SOC would not always prevent a low state of well-being, but rather would be a sign of good adaptive capacity to the situation. A high SOC provides a successful way of dealing with a stressful situation like pregnancy, and influences the emotional response to the adaptive process in pregnancy (Sjostrom, Langius-Eklof & Hjertberg, 2004).

Another relevant point of discussion and research is if SOC remains stable throughout life, and if there are factors that can improve it. There are evidences that the level of SOC has a tendency to increase with age (Erikson & Lindstrom, 2006) and some authors believe that challenging factors can reinforce it, like pregnancy. In order to clarify this issue, the evolution of SOC during pregnancy has been studied. A large research evolving 395 pregnant women in Sweden (Abrahamsson & Ejlertsson, 2002), found that the level of SOC in these women was higher than the obtained in other studies with non pregnant women, one of them in Sweden (Larsson & Kallemberg, 1996) and another in Canada (Wolff & Ratner, 1999). This conclusion allows Abrahamsson and Ejlertsson (2002) to conclude that pregnancy might be responsible for the increase in SOC, as they considered that this period of life has a high existential meaning. However, other studies did not confirm this hypothesis (Carvalho, 2005).

What seems to be a consistent result is the fact that pregnant women with a higher SOC are more resilient. A relation between stress biological markers, and SOC in the final stage of pregnancy and after delivery was studied, bringing new data to this discussion. In women with low scores of SOC, the level of depression was higher, and the level of S-ig A was lower (a marker of stress), when compared with women with a high SOC, indicating that stress reactions were more intense in the low SOC women. The findings of a relationship between low scores of SOC in the prepartum stage and depressive tendency, suggest that women who are more prone to develop depression, can be predicted. This result supports the relevance of evaluating SOC during pregnancy (Sesisuka et al, 2006).

1.2. The burden of mental disorders

About 450 million people in the world suffer from mental disorders (World Health Report 2000), 10% of the adult population will have some mental or behavioural disorder throughout his life.
(WHO, 2001), 20% of adolescents aged below 18 years suffer from developmental, emotional or behavioural problems, and one in eight has a mental illness. The neuropsychiatric disorders are responsible for 13% of the years lived with disability (disability adjusted life years - DALYs) (WHO, 2003). We know that five of the ten leading causes of incapacity worldwide are psychiatric illnesses, namely depression, alcoholism, schizophrenia and obsessive-compulsive disorder (Murray & Lopez, 1996). Specialists predict that in 2020, neuropsychiatric disorders will be responsible for 15% of the disabilities in the world, and that unipolar depression will account for 5.7% of total DALYs.

In Portugal the recent first survey in mental health (Caldas de Almeida & Xavier, 2013) reported that 22.9% of the sample studied had a psychiatric disorder in the 12 months previous to the study, what means that Portugal has, with North Ireland, the highest prevalence of psychiatric disorders in Europe, with a clear distinct pattern of other South European countries. Anxiety disorders represent 16.5% of the diagnoses, followed by mood disorders with a prevalence of 7.9%, and impulse control disturbance (3.5%) and substance abuse (1.6%). According to this survey, 4% of the adult population presents a severe psychiatric disorder, 11.6% a moderate disorder, and 7.3% a low severe psychiatric disorder. Women have a higher risk than men of developing depressive disorders (OR=2.30) and anxiety disorders (OR=2.89), while men have a higher probability of suffering from impulse control disturbance and substance abuse.

The group who had previously been married presented a higher risk of suffering from depressive disorders and substance abuse, and the group who had never been married, had a higher risk of suffering from substance abuse and impulse control disturbance.

They've found an association between low-medium level of education and both impulse control disturbance and substance abuse. They did not found a significant association between income and psychiatric morbidity.

In a previous study conducted by the European Union that evaluated mental health in various countries of the European Union (European Commission, 2004), Portugal was one of the countries with lower levels of positive mental health and higher levels of emotional distress. In addition, mental illnesses were found to have a high socio-economical impact on individuals, their families and community. This study showed the existence in our country, of large differences between the sexes, since Portugal was the European country where women have a higher risk of emotional disturbance than men. According to the same study, in Portugal women seek more help than men for their problems, and this difference between men and women, in the level of looking for care, is more marked than in other countries.

In the Member States of the European Union, the cost of mental health problems is estimated to be between 3% and 4% of gross national product. Studies also demonstrated that the relative and absolute costs of treating chronic mental disease conditions, are comparatively high when compared with other health disorders. In the United Kingdom, for example, the
aggregate costs for all mental health disorders are of 44,8 millions euros (European Commission, 2004).

In developing countries, although it is estimated that the direct costs are not so high, due to the limited existence of mental health services, indirect costs affecting productivity are also very high (WHO, 2001). The money that is saved on not treating these patients is translated to an increase of indirect costs, namely unemployment, absenteeism, criminality, the impact on families and caregivers, premature death and also the negative consequences of stigma and discrimination (WHO, 2001; Hosman & Jané-Llopis, 1999).

Mental illnesses have also some gender particularities, like different distributions according to gender (e.g. affective disorders are closely related to women's hormonal history, and men have a higher prevalence of schizophrenia and hyperactivity). Beyond the issues attributable to gender and social or economic disadvantages, inequity in the access to treatment and services' use, as well as gender violence have to be considered.

In the perinatal period, women have a higher vulnerability, caused by a miscellaneous group of biologic, psychological and social factors. One in five women will experience a mental illness in the period up to one year after the postpartum, although many of these cases are not diagnosed or treated (Austin, Priest & Sullivan, 2008; Dennis & Allen, 2008). Many of the mental health problems that arise in this period (depression, anxiety, alcohol and drug abuse, substance and domestic violence) are recognized as public health problems (Buist et al, 2005), as these issues have a significant impact on families and also in the future development of the baby (Murray, Cooper & Hipwell, 2003). Several authors have shown that it is possible to minimize these problems through intervention programs (Armstrong et al, 2002).

1.3. Mental health promotion and mental disorders prevention

1.3.1. Mental health promotion and mental disorders prevention and the new public health

The similarities and boundaries between the concepts of mental health promotion and mental disorder prevention are not clear but this clarification is relevant, as it has a large impact in the priorities that are defined by politicians and health services.

The aim of mental disorder prevention is to "reduce the incidence, prevalence, and recurrence of mental illness, decreasing the time with active symptoms, or decreasing the risk for mental illness, preventing or delaying recurrences and also decreasing the impact of the disease in the affected person, her family and community" (Mrazek & Haggerty, 1994).
Mental disorder prevention is closely linked to an understanding of public health, as “the process of mobilizing local, national and international resources to solve the major health problems affecting communities” (Detels et al, 2002).

Mental ill-health refers to mental health problems, symptoms and disorders, including mental health strain and symptoms related to temporary or persistent distress. Preventive interventions work by focusing on reducing risk factors and enhancing protective factors associated with mental ill-health.

Mental health promotion is the development and implementation of effective programmes to promote positive mental health.

As mental health promotion is related to the determinants of health, and mental disorders prevention with the causes of disease, the term ‘health promotion’ is sometimes used as an umbrella, covering also more specific prevention actions (Lehtinen, Riikonen & Lahtinen 1997).

Improving mental health and reducing the personal and social costs of mental illness, implies a comprehensive approach to public health, and encompasses health promotion, disability and disease prevention, and the treatment and rehabilitation of those who become ill (WHO, 2004 a).

So, as well as mental health is part of overall health, mental health promotion is an integral part of health promotion and of public health.

What differentiates the “new public health” from the traditional view is the higher relevance that is attributed to the description and analysis of Health determinants, as well as the need of mobilizing resources and invest significantly in politics, programs and services that create consistency and synergies for health maintenance and protection (Loureiro & Miranda, 2010).

1.3.2. Mental disorders prevention programs classification

In order to clarify this concept, we will describe the different classifications that can characterize the programs that intend to prevent mental disorders.

1.3.2.1. Primary, secondary and tertiary prevention

The Institute of Medicine Report (Mrazek & Haggerty, 1994) proposed a framework for intervention in mental health based on what is currently used for prevention in physical illnesses and the classically used in public health.

Primary prevention aims to reduce the emergence of new cases of a disease reducing incidence; may be focused at a whole population, or at certain groups or individuals at risk.

Secondary prevention aims to reduce the prevalence of established situations through early detection and treatment of diagnosable diseases.
Tertiary prevention includes interventions that reduce disability, promote rehabilitation and prevent relapses and recurrences of the disease, or improve the quality of life among those suffering from a disease.

1.3.2.2. Universal, selective and indicated prevention

In primary prevention, we can account for three types of intervention: universal, selective or indicated interventions (Mrazek & Haggerty, 1994; Gordon 1983). This classification is based on a perspective of risk / benefit, estimating the various levels of intervention according to the level of risk and expected benefit and the size of the target population that could benefit. Universal prevention programs are developed to the general public or to a whole group population, not identified as being at increased risk. Selective prevention focuses on individuals or subgroups of the population which have a significantly increased risk of developing a mental illness, evidenced by the presence of biological, psychological or social risk factors. Internal risk factors refer to increased vulnerability. Indicated prevention targets individuals at high risk, who have minor signs or symptoms, foreshadowing the emergence of a mental disorder, or groups that have biological markers indicating predisposition for mental illness, but not yet achieving the criteria for diagnosis.

1.3.2.3. Disease specific prevention or broad spectrum prevention

The clarification of the risk factors’ specificity for mental disorders, is critical to the design of mental disorders prevention programs. van Doesum and Hosman (2009) address the question if the transgenerational transmission of mental disorders is determined by disease-specific risk factors or if different diseases share common risk factors, which in turn cause an increased risk of many different diseases (broad-spectrum outcome). Prevention programs specific for a particular disease, assume that, that disease is generated by a specific causal mechanism not shared with other diseases, whereas in generic or broad spectrum prevention, the focus is on factors that are associated with the emergence of several diseases. A good example of a broad spectrum risk factor is child abuse, as its existence increases the risk of multiple physical and mental illnesses, and one could assume that preventing child abuse would influence the emergence of not one but a group of diseases. Risk factors specific to certain diseases include genetic and biochemical factors, but also specific parental behaviours, like modelling and reinforcement of anxious behaviour and enhancement of pathological coping strategies like overprotection, externalizing or substance abuse. Negative thinking is specifically related to depression and major depression with suicide.
Even though there are multiple studies showing that children of people with psychiatric illness have a greater risk of developing the illness of their parents, there are also multiple studies that demonstrate that they have also a higher risk of developing a number of other conditions, supporting a broad-spectrum theory (Bijl, Cuijpers & Smith, 2002; Lizardi, Klein & Shankman, 2004).

This is a complex discussion, because the existence of various diseases in the offspring of patients with certain diseases does not mean that the risk factors are always broad spectrum, since many of these diseases have comorbidities. It might, therefore be that the risk of multiple disorders in the children simply reflect the existence of comorbid disorders in the parents, transmitted to the children through disorder-specific risk factors for these diseases.

Risk factors common to several diseases can be, for instance, neglect, abuse, family violence, and insensitive parentification. Their existence could be the result of a parental disease, or context-based and shared by both parents and children, such as poverty, urban violence, substance abuse or domestic violence. These factors are not only common outcomes of different parental diseases, but are themselves responsible for an increase in risk of various problems in the offspring. So, they can be considered as broad spectrum risk factors.

Also many protective factors that buffer risk factors, are usually not specific to a certain disease (e.g. existence of an alternative healthy caregiver, child's social skills and social support from family, friends and others).

1.3.2.4. Micro-prevention, meso-prevention and macro-prevention

Preventive interventions can also be classified according the system level they are focused on, and try to influence: micro-prevention (oriented to the individual and family), meso-prevention (targeting schools, work, and neighbours) or macro-prevention (oriented to the social conditions of a population) (Hosman, 2011).

We can further classify prevention taking into account its purpose: disease prevention, health promotion, reducing consumption of care, cost reduction.

1.3.3. Mental health promotion

As was mentioned before, Mental Health Promotion concerns the development and implementation of effective programs to promote positive mental health. Hosman and Jané-Lopis (1999) defined mental health promotion, as the group of activities involving the development and implementation of individual, social and environmental conditions, allowing an optimal psychological and psychophysiological development. These initiatives involving individuals in the process of achieving positive mental health, improve quality of life and reduce the gap in health expectations between groups and countries. It is an
enabling process that has to be done with and for the population. Mental disorders prevention, can be considered one of the objectives and targets within the wider perspective of mental health promotion.

Mental health promotion programs are designed with the aim of reducing health inequalities and promoting skills, through active participation and accountability to various stakeholders, which is in accordance with the principles outlined in the Ottawa Charter on Health Promotion (WHO, 1986). They also intend to build social capital and create health gain (Jakarta Declaration for Health Promotion, WHO, 1997).

Mental health promotion interventions vary in their spectrum and include strategies that promote the psychological well-being of those who are not at risk, of those who have an increased risk and also of the individuals who are suffering or recovering from mental illness (Herrman, Saxena & Moodie, 2004; WHO 2004a).

In the last decades a growing maturity has emerged in the scientific evidence that supports mental health promotion (Barry, 2001, 2002, WHO 2004a, b; Jane-Lopis & Anderson 2007)

To summarize the differences between mental disorder prevention and mental health promotion, the first emphasizes merely the absence of mental disorders in the concept of mental health (the negative definition), but the second, mental health promotion, values mental health as mental capital, a group of competences that we can promote in order to increase our adaptation capacity to life. In practice, however these concepts are overlapping, while many prevention programs are targeted at increasing competencies in those at risk, and actions to promote mental health could among others result in a lower onset of mental disorders.

Promoting Mental Health is a cornerstone of human, social and economic capital in a society. Politicians should value mental health promotion, as a way of promoting a better life and a more fair society, a strategy to decrease what we spent in treating disorders and a contribution to a more developing and creative society.

1.4. Mental health determinants

The organization and development of mental diseases prevention programs and mental Health promotion programs, requires the analysis of the determinants of mental health.

1.4.1. Risk and protective factors

Programs to prevent mental illness are focused on the determinants that may influence or predispose to their onset, or who may have a role in its development, severity or duration. Risk factors of mental disorders are associated with a higher probability of occurrence of a disease, increased severity or longer duration. Protective factors refers to conditions that improve an
individual's ability to resist to risk factors and to diseases, through modification, improving or changing of one's response to an event that would increase the possibility of a maladaptive outcome (Rutter, 1985).

Many protective factors are individual resources related to positive mental health, like self-esteem, resilience, problem-solving and social skills, ability to handle stress and sense of control. Many preventive interventions focused on strengthening protective factors might overlap mental health promotion.

Risk and protective factors can be individual, or related to family, social, economic and environmental conditions. The result of the balance between risk and protective factors, taking into account their weight and comparative cumulative effect, could point to resilience or vulnerability, leading to the development or not of a disorder or disease, with a great or less severity. Interventions for prevention of mental illness can focus on the identification of risk factors trying to minimize them, or strengthening protective factors trying to improve them.

There is increasing knowledge about the relationship between risk factors and protective factors on development of mental illness (Coie et al, 1993; Ingram & Price, 2000). The higher the relevance of individual factors in the development of a certain mental illness is, the higher will be the effect of a preventive intervention that is focused on it. It is essential to choose determinants that are malleable, so that we can alter their course of development.

At this moment there is a large literature about the impact of a wide variety of risk factors supporting the development and implementation of prevention programs.

The Interventions that cover different related problems, such as social and economic problems are more cost-effective and more appealing for policy makers.

1.4.2. Individual and family-related determinants.

Risk and protective individual and family factors can be biological, emotional, behavioural, interpersonal or related to a family context.

They may have its greatest impact during sensitive periods throughout life; the impact might be direct or delayed or even work across generations.

For example, child abuse or parent psychiatric illness during childhood, can lead to depression or anxiety later in life, as well as in subsequent generations; however a secure attachment and a strong social and family support, can reduce the risk of these consequences later in life or in the next generation. Child abuse is also associated with the onset of physical illnesses, including bone fractures, brain trauma, gastroenterological disease and cardiovascular disease (Gilbert et al, 2009; Beardslee, Soalantus & van Doesum, 2005).

The way different risk and protective factor interacts will be discussed later.
1.4.3. Social, environmental and economic determinants

Poverty, war and social inequality are macro-determinants of mental health. People living in poverty have greater difficulty in accessing basic conditions such as safety, capacity and choice of intervention, access to health care, education and housing, when compared to those who live well (World Bank, 2000). These populations are at risk of poor mental health, depression, and low self esteem (Patel & Jané-López, 2005). Urbanization, war, displacement, racial and economic instability are also associated with higher levels of psychiatric symptomatology. War and war trauma increase the individual possibility of post-traumatic stress, depression and alcoholism, which in turn create a higher vulnerability in the offspring of exposed parents (Musisi, Mollica & Weiss, 2005).

According to Patel (2005), there is a clear association between macro-social factors and mental health. From an epidemiological perspective, poverty is associated with low socio-economic status (measured by income or social class), unemployment and low education levels. For instance, strong associations have been found between low education and depression, as well as between low socioeconomic status, poor housing, low income and depression (Patel & Kleinman, 2003). The relationship between poverty and depression appears to be mediated by a number of other factors including humiliation, insecurity (Narayan et al, 2000) and also to a decreased access to health care and education.

A number of factors related with urbanization can be negative for mental health, as we can find a higher level of stress and fewer protective factors, in urban areas. A large survey involving different European countries found that higher frequencies of common mental disorders (depression and anxiety) are associated with low educational attainment, material disadvantage and unemployment, and with social isolation among older people (Fryers et al, 2005). The pattern of social distribution of common mental disorders shows also a social class gradient (Mc Manus et al, 2007).

Gender inequality plays a significant role in these social issues, while it could contribute across generations to cumulative risk. Gender can conditionate situations of economic or social inequality, or even restrict the access to education, and we know that education promotes autonomy and economic independence.

This issue seems to be especially relevant for Portugal, as the European Commission in (European Commission, 2004) signalized it as the country where there was an increased mental health risk in some specific groups like women, older people, people that according with their marital situation were more isolated (single or divorced), and pointing that the common mediator factor for this situation was the lack of social support.

A two-way relationship seems to exist between mental disorders and socioeconomic status, as mental disorders lead to reduced income and unemployment, which entrenches poverty and in turn increases the risk of mental disorders.
These associations have a lifelong impact, for example children of poor mothers are more likely to be disadvantaged even before birth, with an increased likelihood of poor nutrition during pregnancy and low birth weight and exposure to stress, poor working conditions and demanding physical labour. These prenatal conditions have an adverse impact on the development of emotional and cognitive brain systems of the child. Lower maternal education has been associated with increased child mortality and malnutrition, overweight children, conduct problems, emotional problems, lower cognitive scores and mental health problems. Programs that promote the empowerment of women and the poor, promoting gender equality and equity in economic development, have a marked role in promoting maternal and child mental health. A large body of evidence emphasizes the importance of maternal education for a wide range of outcomes of their children (Bicego & Boerma, 1993).

1.4.4. Interaction between various risk and protective factors

The number of risk factors and how they are balanced by protective factors appear to be critical for their impact and future consequences in a particular individual; this seems fundamental for the design of prevention programs. This issue has important clinical implications, as children and their families who are identified as being in a situation of greater vulnerability due to an accumulation of risk factors, will require more urgent interventions than those in which the existence of the same risk factor is not associated with others, or where the protective factors are strong enough to reduce the impact of present risk factors. In these latter cases only simpler interventions could be sufficient or there might even be no need for intervention. There exist different ways in which multiple risk factors could have a cumulative effect on the onset of mental disorders. We differentiate between additive effects, exponential effects, threshold effects and sequential effects.

1.4.4.1. Additive and exponential effects

In additive effects, each risk factor contributes singly to the development of a disease and the effects of multiple independent risk factors could be summed. The accumulation of risk factors may also have an exponentially effect as the number of risk factors increases. This is the case when multiple risk factors interact with each other. This results in a curvilinear relationship between the number of risk factors and the risk of onset of a mental disorder.
1.4.4.2. Cumulative effect in combination with threshold effect

A threshold effect of multiple risk factors, means that the number of risk factors needs to exceed a certain threshold (e.g. > 3 or 4 factors) before the existence of multiple risk factors could result in the onset of a mental illness. Most people are able to cope with a restricted number of risk factors.

1.4.4.3. Sequential effect

Sometimes, risk factors are successively interlinked, becoming more and more difficult to alter a particular route. Depressed mothers frequently present difficulties in the interaction with their babies, who as a consequence will develop an insecure attachment that will affect their development and interaction with others.

1.4.4.4. Sensitive periods

The timing for the appearance of risk factors seems also to be very significant. Some factors may have significant impact during certain crucial ‘sensitive’ periods of childhood development, while not during others. The impact of certain risk factors, for instance the exposure to high levels of stress, may be greater during periods that they interfere with the development of emotion-regulation systems in the brain or social-emotional competencies (Sroufe et al, 1999). Several studies have shown that the effect of low socioeconomic status, social development and crime, is particularly relevant in early childhood and not later (Brooks-Gunn & Duncan, 1997; Elder & Rockwell, 1979).

1.4.5 Studies about the interaction of several determinants

The studies developed by Rutter in the Isle of Wight and the Rochester Study, developed by Sameroff, were fundamental for the comprehension of how different risk factors interact and increase the risk of a disease.

In the study conducted on the Isle of Wight, Michael Rutter (1979) identified six risk factors correlated with the occurrence of psychiatric disorders in childhood: severe marital conflict, low socioeconomic status, parental criminality, large families, maternal mental illness, and foster placement. It was demonstrated that as the number of risk factors increases, the probability of a psychiatric disease increased. This effect seems to be a threshold effect, since after a certain number of risk factors, there is a dramatic increase in the incidence of psychiatric illness. In this study, the existence of more than four risk factors implies a dramatic increase in the consequences, and the authors proposed four as the threshold. Researchers
discuss if there is a self potentiating of risk factors, or if it is an effect resulting from the sum of their separated effects (Rutter, 1979). Other authors define the threshold of 3 or 4 risk factors (Greenberg et al, 2001) considering the existence of more than 3 risk factors as the threshold for the development of several psychiatric diagnoses, like for example defiant behaviour or attention deficit.

Another classic study in this field is the longitudinal study of Rochester, developed by Sameroff, in which ten risk factors were identified for the occurrence of behavioural problems, including: maternal history of psychiatric illness; high levels of maternal anxiety; attitudes, parental beliefs and values about child development; observation of few positive interactions between parents and children; undifferentiated occupational status; low maternal education; minority family in a situation of social disadvantage; recent life-events; numerous families. This study demonstrated the association between the number of risk factors and the existence of behavioural problems in pre-school (Sameroff et al, 1987) as well as the existence of mental health problems in adolescence, behaviour problems and academic problems (Sameroff et al, 1998). The relative risk was markedly higher in the groups with more risk factors than others. The children with 8 or more risk factors, had 7 times more possibilities of developing bad school results, than those who only had 0-3 risk factors. Mediators identified included psychological maladjustment, low self competence, behaviour problems, low involvement in activities and poor academic performance. Sameroff suggested the existence of a linear or additive effect (Sameroff et al 1998).

Other authors (Appleyard et al, 2005) also proved the effect of a progressive increase effect of the cumulative number of risk factors and linearity, like Sameroff. The authors considered these results as positive, because they do not validate the existence of a threshold of no return. These researches have important implications for clinical work, and they validate the relevance of reducing the number of risk factors (since they are malleable) even that others can't be eliminated.

1.4.6. Clusters comorbidity

The common association of various risk factors, leads to the aggregation of a number of diseases and disorders associated in clusters. Although is not always easy to identify the mechanisms that lead to their appearance, the experience in intervention studies has demonstrated, that a more broad and comprehensive intervention program, could achieve multiple outcomes that are associated in some way, especially when we are intervening in high risk populations.

An example of such cluster is what happens with child abuse, a large and complex social problem, which is a significant risk factor for a large number of diseases, transmitting from one generation to another a cluster of comorbid diseases. Analyzing its outcomes, researchers
have proved that sexual and physical child abuse is associated with short and long term mental and physical illnesses. Child abuse is associated with an increase in post traumatic stress disorder, low self-esteem, anxiety, depression and suicidal ideation, less social competences like relationships with peers, eating disorders, substance use, delinquency, sexualized behaviour and a greater likelihood to be re-victimized. These children have frequently physical injuries, sexual transmitted diseases, bone fractures and other disorders, including HIV. All this has a huge social and economic impact, creating a complexity of problems that make it increasingly difficult to break this almost determined cycle (Gilbert et al, 2009; Maniglio 2009). On the other hand, we can think about the determinants of child abuse and the mechanisms that lead to its perpetuation. Through mediational analysis it was concluded that the transgenerational transmission of child abuse, could be explained in 62% of the total effect, through the presence of parental styles deficit, in combination with three other factors, including parenting before 21 years, history of mental illness or depression and cohabiting with a violent adult. Some of these risk factors are malleable, and may be targeted by intervention programs, other can help us to recognize at-risk families (Dixon, Browne & Hamilton-Giachritsis, 2005).

Several social factors are associated with a higher frequency of child abuse, such as impoverishment (Coulton et al, 1995). From the 177 areas (urban census tracts) evaluated by these authors, the areas that had a greater frequency of child abuse, were those in which predominated poverty, unemployment, single parent families, racial segregation and loss of population. Also areas with the greatest number of children, which consequently had a lower child monitoring, had a higher frequency of child abuse.

1.5. Intervention strategies in women, maternity and early childhood

Some macro-preventive strategies have shown to improve mental health and reduce the risk of mental illness (Patel & Janés-Lopis, 2005; Musisi, Molica & Weiss, 2005), namely improvement of nutrition, housing, access to education, reduction of economic insecurity, strengthening community network and reducing the impact of substance use.

Low literacy and low educational level limits the individual capacity to access a better economic level. In women, these factors strongly condition their autonomy, especially in developing countries.

There is ample evidence that early intervention programs are powerful prevention strategies, and that programs that have demonstrated greater efficacy were targeted to risk factors and protective factors in early life, in families of low income and low education (Brown & Sturgeon, 2005). In these programs, interventions include home visits during pregnancy and infancy,
reducing smoking during pregnancy, parent education strategies and training programs for preschoolers.

The areas that are crucial on investing in mental health promotion and mental disorders prevention are those related with a good start in life, as are listed by Hosman (2007), namely:

- **Pregnancy**
  Lifestyle, preparation for a healthy parenting, stress reduction and substance use, reducing prematurity and low birth weight

- **First years of life**
  Parental education, parent baby interaction promotion, support for mental illness, detection and intervention in substance abuse, coping with family stress, support to single parent families, prevent child abuse and neglect

- **Social Conditions**
  Creating a social network, identify and support poverty, lack of social support and immigrant families.

Perinatal mental health problems associated with pregnancy, delivery and first year of life, are recognized as public health problems, due to their frequency and consequences in the future. Between birth and baby age of 3 months, 15% of women develop a depressive episode (Gavin et al, 2005). Diseases that may arise in the post delivery period are depressive disorders, anxiety disorders, post traumatic stress, bipolar disorder, schizophrenia, and puerperal psychosis (Brockington, 2004; Elliot et al, 2000; Fergusson et al, 1996, Stuart et al, 1998). Comorbidity is frequent, and these disorders are often associated with domestic violence and alcohol and drugs abuse (Carter et al 2003; Preising, Merikangas & Angst, 2001). It is also assumed that mother’s mental illnesses have a negative impact on the cognitive, emotional, social and behavioural development of the child (Atkinson & Zucker, 1997; Barnet et al, 1993; Campbell, Cohn & Meyers, 1995; O’Connor et al, 2002; Murray & Cooper, 2004).

Depression, anxiety, substance abuse and domestic violence in the perinatal period, were recognized as major public health problems (Buist et al, 2005), subsequently associated with poor outcomes in women, their sons and husbands (Murray, Cooper & Hipwell, 2003). Studies that assessed intervention programs, have shown that mental health problems during the perinatal period can be minimized by interventions programs (Armstrong et al, 2002; Olds, 2005; Kemp et al, 2011; Shaw et al, 2006).

The conclusion is that maternity and early childhood are a period of risk, but also a window of opportunity to mental health promotion, as the results of intervention programs are positive, and because it’s a period in women’s life, where they look for care and are more available to intervention.
Theoretical framework

1.6. The relevance of detecting risk in maternal consultation - The need of an instrument to access risk in primary health care

As it was mention before, the perinatal period appears to be a window of opportunity to identify families that would benefit of support and early interventions. It is important to develop tools for risk detection, in maternal consultation during pregnancy, enabling professionals to implement early support for these women, and to minimize their problems. In recent years several instruments have been developed to identify risk factors in pregnancy for emotional problems in postpartum (Austin et al. 2008; Blackmore et al. 2006). Among the studies that identified risk factors for mothers and sons poor outcomes, one of the most significant was an Australian study, involving 40,000 women, that confirmed the relevance of the following potential risk factors: mental health problems (past or present), domestic violence, substance abuse, past history of abuse, anxiety, lack of support, separation, unemployment, low socioeconomic status and stressful pregnancy (Austin, Priest & Sullivan, 2008; Bilszta et al, 2008a; Buist et al, 2005). The effects of stress experienced during pregnancy, associated to domestic violence during pregnancy, have a long term negative impact on the fetus and the baby (Glover & O’Connor 2006), apart from the fact that pregnancy is a period with a major risk of domestic violence (Gartland et al, 2011). Violence is not often addressed spontaneously by pregnant women, or health professionals, making that issues related to violence for example, are often not identified or addressed.

A group of Canadian researchers (Wilson et al, 1996) published scientific review on the evidence about the association of a group of risk factors detected during pregnancy, with adverse situations in postpartum that are known to have great impact on child development. These adverse situations in the postpartum were domestic violence, child abuse, post partum depression, marital dysfunction and physical illness. This scientific review and the identification of these risk factors, were the basis for the Antenatal Psychosocial Health Assessment a risk assessment instrument for use during pregnancy.

Austin, Priest and Sullivan (2008) performed a Cochrane review showing that the use of an instrument to detect potential risk factors, the evaluation of the emotional state associated with an availability attitude from the staff, increases the detection of risk situations during pregnancy. However, some doubts still remain concerning the specificity and sensitivity of these instruments and about their ability to detect women at risk of developing post partum depression or emotional disorders.

The development of these instruments seems of great usefulness for intervention in primary health care, including the issue of valuing the total number of risk and protective factors, and the way they interact (cumulative effect exponential or threshold).
1.7. Conclusions

According to the theoretical review in this chapter we can conclude that mental health promotion is supported by a strong body of knowledge and is a matter of public health with a large impact on society. Mental health promotion programs should be implemented as soon as possible in life, like it happens in pregnancy. Programs should focus on malleable determinants, introducing strategies to reduce risk factors or their impact on mother and child, and also on strengthen protective factors to increase resilience. Nowadays it’s possible to operationalize the concept of mental health, as it happens with the concept of sense of coherence. The ambition of early detect risk situations requires the development of tools to assess risk, the creation of a responsive network services based on primary health care, namely on maternal consultation where women are assisted during pregnancy and on the first months of the child.

The number of risk factors and the way they interact between them and are buffered by protective factors are relevant for the final impact.

The programs should take into account specific characteristics of a population that can influence the mother and child mental health, and the existing services, creating a comprehensive approach.

Mental health is a capital that we can promote and that will influence the future development of a child and in consequence the future of a society.
PART I
THEORETICAL FRAMEWORK

CHAPTER 2
MATERNAL-FETAL ATTACHMENT
Theoretical framework
2. MATERNAL-FETAL ATTACHMENT

2.1. Definition
2.2. Maternal-fetal attachment determinants
2.3. Maternal-fetal attachment and post-partum outcomes
2.4. Maternal-fetal attachment and mother-infant relationship
2.5. Conclusions
2. MATERNAL-FETAL ATTACHMENT

In this chapter we will review the different contributions to the definition and operationalization of Maternal-fetal attachment (MFA) and describes the main researches concerning its determinants and outcomes, namely its impact on mother-child relationship. The limitations and critics to the concept will also be described.

2.1. Definition

Cranley was a pioneer in valuing early connection between mother and baby, even during pregnancy, introducing the concept of Maternal-fetal attachment (1981). Since then, several questions have been raised about this concept and its operationalization for research. They are aimed at creating a valid and measurable construct, that allows us to better study and understand its determinants, and the impact of a weaker MFA on mother-baby interaction, and on the later child development.

Only with an operationalized concept, it will be possible to obtain valid results, which may be useful in the design of prevention programs, trying to create the necessary conditions for a better start in life, still during pregnancy. The fact that, in this period of women’s life, they usually approach to health services, and have a greater acceptance of professional intervention, creates a window of opportunity to prevention programmes that we must take advantage of.

Pregnancy and childbirth are commonly seen as a wonderful period in which the mother can only be happy, which in fact does not always happen.

Cranley defined MFA as “the extent to which women engage in behaviours that represent the affiliation and interaction with their unborn child” (Cranley, 1981). It is a growth process that lasts throughout the entire pregnancy, with multiple components, where the mother enters the child that will be born, in her personal and family history (Brazelton & Cramer, 1993).

Cranley matured this construct, defining five dimensions of MFA: differentiation of the pregnant women with the fetus, interaction with the fetus, fetus assignment characteristics, identification with the maternal role, giving of self. These dimensions are the subscales of the instrument that operationalizes this concept, the Maternal-Fetal Attachment Scale - MFAS (Cranley, M.1981).

Another definition, proposed by Muller (1993), defines the maternal-fetal connection as the "unique, affective relationship extending between a woman and her fetus". The instrument he developed (Prenatal Attachment Inventory) measures essentially, the affective relationship between mother and foetus.

Condon defined "Prenatal Attachment" as "the emotional bonding that usually develops between the pregnant woman and her unborn child" (Condon & Corkindale, 1997). According
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to the author it is important to distinguish between mother's attitude in relation to the fetus and her attitude to the state of pregnancy and motherhood in general. Condom developed an instrument, the Maternal Antenatal Attachment Scale which assesses mainly the thoughts and feelings of the mothers about their babies (Condon & Corkindale, 1997).

Shieh, Karvitz and Wang (2001) consider that there are three fundamental dimensions in attachment during pregnancy: cognitive, affective and altruistic. Cognitive attachment describes the desire to know the fetus; affective attachment corresponds to the pleasure associated with the interaction with the fetus; altruistic attachment corresponds to the desire to protect the fetus. Other authors (Sandbrook & Adamson-Macedo 2004) argue that the bond between mother and fetus is essentially a huge instinctive desire to protect it, which leads the mother to promote a series of behavioural changes to ensure a secure intrauterine environment and remove potential threats to the fetus.

Despite all these considerations and different views about its definition and operationalization, MFA has been considered a developmental task fundamental on pregnancy, and also an indicator of adaptation to pregnancy and of a good engagement with prenatal health practices (Callister, 2002; Lindgren, 2001 cited by Alhusen, 2008). MFA can be a useful concept for clinical practice and research and the existing scales are widely used around the world.

2.2. Maternal-fetal attachment determinants

Essential for the validation of intervention strategies that aim to strengthen MFA, is the understanding of its determinants.

After years of research that often provided contradictory results, meta-analyses were conducted, with extremely relevant results that are described below. We will present the most relevant data from the integrative reviews of Canella (2005), and Alhusen (2008) and the meta-analyses of Yarcheski (2009). Finally we will describe a study that introduces a fundamental issue that contributes to the interpretation of the research results, namely the way mother’s personality factors influence MFA.

Canella (2005) selected 41 studies published in English, from databases and citations. She identified 152 relevant findings, 70 with significant statistical results that were selected. She pooled the result analysis in three areas; psychosocial, demographic and pregnancy related variables.

The analyzed psychosocial variables were social support, relationships with others, self esteem/self-concept, sense of control, mental health variables (anxiety, depression, stress and distress, coping) and health outcomes. The results were not encouraging since she did not found significant relationships. Canella suggests that this was the result of methodological
issues such as small sample size, or shape selection, psychometric characteristics of the scales, and the fact that many of the studies only have an exploratory character. The other issue that seems to be relevant was the fact that in many of the studies, the study design was not based on a clear and robust theoretical model.

One of the most important determinants to evaluate because of its malleability, was social support. The results obtained by Canella in her review were not encouraging, since no clear correlation was found between social support and maternal fetal attachment.

In this review there was neither evidence of studies that proved a correlation between self-esteem and MFA in adolescents (Koniak-Griffin 1988), adult women (Cranley, 1981) neither in low or high risk mothers (Mercer et al, 1988). Gaffney (1986) found no relationship between self concept and MFA, while Curry (1987) found a positive correlation between self-esteem and MFA. Mercer et al (1988) found a weak positive correlation between sense of control and MFA in low-risk, but not in high-risk women. The author concludes that positive attitudes to oneself or personal control have little influence on the MFA.

She found no significant correlations between anxiety trait and MFA in two studies (Gaffney, 1986; Stanton & Golombok, 1993). Gaffney (1986) found an inverse correlation between anxiety state and MFA, while Stanton & Golombock (1993) did not.

Mercer (1988) reports no correlation between anxiety and MFA, in low and high risk mothers. She also concluded that depression had a weak negative correlation with MFA in low-risk women, but not in high-risk women. Lindgren (2001) found no correlation between depression in pregnancy and MFA, and Grace (1989) also found no correlation between MFA and Postpartum depression.

The same conclusions arise from the selected studies that analyzed the relationship between socio-demographics variables like age, number of children, education, economic status, marital status ethnicity and MFA. The results of several studies were contradictory and inconsistent. For example, in relation to age there are several studies that value age as negatively correlated with MFA (Lindgren, 2001, Mercer, 1988), but most do not draw the same conclusions (Kemp & Page, 1986; Curry, 1987; Wayland & Tate, 1993; Zachariach, 1994). A group of researchers concluded that women over 35 years had lower levels of MFA than those who were in the second decade of life (Berryman & Windridge, 1996), while others have found no differences between adolescents and older women (Kemp, Sibley & Pond, 1990).

Regarding the variables related to pregnancy, researchers found positive correlations of maternal-fetal attachment with the attitude towards childbearing and perception of fetal growth and development at 16-20 weeks. These results raise the question of the proper timing during pregnancy, to use the scale.

These authors analyzed longitudinal studies, reporting impressive results that support the assumption that MFA corresponds to a maturation process throughout pregnancy, and show
the predictive clinical significance of MFA on mother-baby bonding, mother-infant interaction and maternal skills over time.

Several authors have documented the increase of MFA on the second and third trimester pregnancy (Mikulincer & Florian, 1999; Caccia et al, 1991). According with these results, the authors also raise the question about what is the desirable level and variability in MFA across different times of pregnancy, so we can give value and meaning to the results.

The experimental studies that were analyzed in this review (Koniak-Griffi & Verzemnicks, 1991; Mikhail et al, 1991), have shown that it is possible to strengthen maternal-fetal attachment, which is fundamental to the rationale of such interventions. Regarding the evolution of MFA throughout pregnancy, several authors have documented an increase of MFA during the 2nd and 3rd trimester of pregnancy (Mikulincer & Florian, 1999; Caccia et al, 1991).

Alhusen (2008) published a critical review of the research literature on MFA since 2000, selecting 22 original studies that met the following inclusion criteria: clear definition of how to measure MFA; assessment of MFA during pregnancy, including women, couples or both. The selection of studies was carried out according to research quality criteria as design, methodology and clarity of results.

The main findings of this review indicate that some factors threaten MFA including depression, anxiety and substance use while others appear to promote it. Depression could start during pregnancy and have a similar prevalence before and after delivery (Austin 2003; 2004; Evans et al, 2001, Green, 1998). Three studies evaluated the association between psychological well-being / distress and MFA (Hart & McMahon 2006; Lindgren 2001; Zachariach 2004). Lindgren (2001, 2003) demonstrated that women with lower levels of depression had higher MFA and that this had a direct effect on her health practices. Hart and MacMahon (2006) showed that the quality of MFA was negatively correlated with the levels of depression and anxiety.

The author of the review warns that these results should be carefully interpreted, since they are based on studies using self-questionnaires, assessing women in different gestational ages, and corresponding to small and homogeneous samples (mostly highly educated, married and employed).

Several studies demonstrated a negative correlation between the abuse of various illicit substances and MFA (Sieh & Kravitz, 2002, 2006), associated with a marked feeling of guilt, uncertainty and worry. There is also a huge shortage in research on the relation between ethnicity and MFA and the available outcomes are inconsistent. Ahern and Ruland (2003) found no statistically significant differences between African-American and Hispanic-American women, but other authors (Wilson et al, 2000) reported lower levels of MFA in African American women and raised the question about the validity of this cultural construct.
There are many evidences that, the quality of mother-baby relationship depends on how the mother recalls her own experience in interacting with her mother (Fonagy, Steele & Steele, 1991; Main & Hesse, 1990), but the majority of studies on which these conclusions are based, included mostly middle-class women that had planned their pregnancy.

Family mutuality, a concept that describes a secure relationship in a family that is available to accept a new member, is positively correlated with MFA (Wilson et al, 2000).

MFA is positively correlated with planning of pregnancy, marital relationship stability and gestational age (Shieh, Kravitz & Wang, 2001), but the authors admit that these factors that promote MFA, seem to be closely correlated with a higher socioeconomic status and the related easier access to health care, higher family stability and better social support. They also noted the enormous methodological limitations and the heterogeneity of the studies, such as the moment where mothers are assessed during pregnancy, the large insufficiency in registers or assessments, the size samples or the selection criteria.

Yarcheski (2009) performed a meta-analysis in order to identify the determinants of MFA and the magnitude of this correlation, through the use of a quantitative methodology.

A total of 115 studies and 68 PhD theses were selected, from which 72 met the following inclusion criteria for this meta-analysis: published in English, use of different instruments to assess MFA and its determinants, and a number of methodological criteria that guaranteed the research quality. Fourteen variables were identified as possible determinants of LMF. A quality index was created to classify the different studies taking into account the type of sample, its size, the assessment, the results validity and reliability and study design.

Of the 14 identified predictors, 4 were subjective in nature (social support, anxiety, self-esteem and depression), 5 were related to pregnancy (gestational age, prenatal ultrasound, pregnancy planning, parity, and high-risk pregnancy), and 5 were socio-demographic (age, ethnicity, marital status, economic income and education).

Social support was the most decisive determinant of MFA, and surprisingly the effect sizes indicated that the relationship was only moderate (all $r=.27$).

Condorn and Corkindle (1997) argue that the difference between the social support that is needed and the level of social support perceived by the woman, because she is pregnant, could skew the results. The perceived level could decrease, if there was an increase of her expectations, and the identification of a higher level of needs associated to pregnancy could exist what would influence the magnitude of the relationship between social support and MFA.

Regarding self-esteem, anxiety and depression, their effect size is low (respectively all $r=.19$; $r=.17$; $r=.17$), indicating that their relationship with MFA is significant, but weak. More studies need to be performed in order to increase the understanding on this issue and the validity of this conclusion.
Gestational age was the most powerful predictor for MFA with an r effect size indicating that the relationship is moderate to substantial (r=.27-.36).

Several studies have addressed the fact that MFA continuously increases through pregnancy (e.g. Sandbrook & Adamson- Macedo, 2004). These results highlight the relevance of assessing MFA in the end of pregnancy.

The performance of ultrasounds during pregnancy also found to reinforce MFA, as the mean effect size, as reported by Yarcheski, is moderate (r=.25-.27).

According to the metanalysis performed by Yarcheski, predictors associated with pregnancy, in particular number of children, planning of pregnancy, and high-risk pregnancy does not seem to have any significant effect on the MFA (r effect sizes respectively r=.13-.14; r=.15-.17; r=.0.5).

Factors such as prenatal education or the perception of fetal movements must be more researched since studies on these issues are scarce.

Regarding socio-demographic determinants, like age, marital status, ethnicity, economic status, years of school all have demonstrated to be of low relevance to MFA (with r effect sizes of r=.16-.17; r=.11-.12; r=.11-.14; r=.11-.12; r=.10)

Concluding, the literature review and the metanalysis performed by Yarkeshi, concluded that more rigorous studies are needed, and that social support and gestational age were the most significant predictors for MFA, which underlines the importance of establish or reinforce social support during pregnancy, what is particularly relevant for vulnerable populations.

Another relevant conclusion is that MFA increases throughout pregnancy, and that its evaluation should occur only in the third trimester, and only valued when the results are lower than the expected for that time of pregnancy.

We can conclude that in the literature many different determinants of MFA are suggested. The results from these reviews and metaanalysis are, however, very heterogeneous and not consistent and implicate that more studies are needed. Social support, anxiety and depression seems to be some of the most strong predictors, but even those are not consistent. More studies have to be done with different populations, namely high risk population or from different ethnic groups.

Looking for possible explanations for these disappointing results, other authors have developed studies to clarify this issue. They argue that MFA is established between the mother and the unknown and imaginary baby, according to her previous experiences, psychological and personality’s characteristics. The way she invests on her baby depends on her hopes and fears. It’s a subjective concept, and impossible to be observed. Sjogren et al (2004) have provided evidence of these aspects, and underlined the fragility of the concept especially when we intend to measure it. They examined the relationship between personality characteristics of pregnant women and MFA, demonstrated the existence of a positive
correlation between the total score of the scale and the tendency to feel guilty and the desire for social acceptability, assessed by Karolinska Scales of Personality. MFA Subscales were positively correlated with somatic anxiety, guilt, psychasthenia, social acceptability, aggression inhibition and time of pregnancy, and negatively correlated with psychic anxiety and emotional detachment.

2.3. Maternal-fetal attachment and postpartum outcomes

Despite the large speculation about the influence of MFA in the way pregnant women commit in health care during pregnancy, and also about the impact of this commitment in the duration of pregnancy and birth weight, and the subsequent influence of MFA on these birth outcomes, until recently there were no studies that clearly highlighted this issue. In order to clarify it, a study involving 167 women was developed, in an urban, low-income, Afro-American sample. Alhusen et al. (2012) demonstrated that MFA is positively correlated with the women’s investment during pregnancy in health practices like rest, balanced and healthy nutrition, avoiding harmful substances, seeking for care and monitoring and implementing safety measures and hygiene. Subsequently, healthy practices during pregnancy are positively related with duration of pregnancy and birth weight. In addition, it was found that babies born from mothers with a higher MFA had a lower rate of preterm delivery and low birth weight. According to Alhusen et al. (2012) health practices during pregnancy mediate the relationship of MFA and adverse neonatal outcomes. These results are extremely relevant to show the importance of MFA as a way to strengthen adherence to a healthy lifestyle. However, the correlation with preterm delivery, must be carefully interpreted, as it is known for example, that prematurity is multifactorial and higher in the African ethnic group (Hessol, Fuentes-Afflick 2005). This association seems to be related with an identified gene, which polymorphism may decrease the production of collagen and decrease the resistance of the amniotic sac membranes, leading to premature rupture of membranes and pre-term delivery (Holden, 2006).

MFA is also positively correlated with maternal skills (self-esteem in motherhood) in postpartum and at 1 and 8 months after delivery in women at high risk (and not in low-risk women) (White et al, 1999).

2.4. Maternal-fetal attachment and mother-infant relationship

Some authors have analyzed the relationship of the strengthening connection between a mother and her baby throughout pregnancy, with their relationship after birth.
Cranley (1981) did not found a statistically significant relationship between MFAS and mothers perceptions about their 3 days babies, using the Neonatal Perception Inventory; however, Fuller (1989) also using MFAS, has demonstrated its correlation with maternal interaction with their child three months after delivery and Leifer (1980) demonstrated that the psychological functioning of the mother during pregnancy, predicted their emotional relationship with the foetus and later with the baby two months after delivery. Leifer also showed that women, who had an intense affection for the baby, described this feeling as something that had began during pregnancy.

Among low and high-risk mothers, MFA predicted bonding of mother and baby postpartum but not at 8 months after delivery (Mercer & Ferketish, 1990). The same predictive value of MFA on mother baby postpartum bonding was found by Fuller (1990) in the 2nd and 3rd day after delivery, on a group of low risk women.

Muller (1996) found a modest correlation between prenatal attachment (using the Prenatal Attachment Inventory, PAI) in the third trimester of pregnancy and maternal attachment (using the Maternal Attachment Inventory) 1 or 2 months after delivery.

Siddiqui (2000) evaluated 100 pregnant women also using the PAI (PAI includes five dimensions: fantasy, interaction, affection, baby’s differentiation and sharing of pleasure), and then videotaped and evaluated mother-infant interaction in the domains of maternal involvement, maternal stimulation, maternal response, mother non-involvement and attentive baby behaviour. The study showed that pregnant women who experienced more affection to the fetus, and fantasized about the baby, had a higher level of involvement with the baby after birth. In general, they were more active, with a higher and more proximal level of stimulation to the baby. Mothers who used a more distal stimulation were those who experienced differentiation of the fetus during pregnancy, or those who saw the fetus as someone clearly distinct from them. They did not find any association between prenatal attachment and mother’s response to her baby after birth. But, in this study the baby attentive behaviour seems to be correlated with the mother’s response.

Flykt et al, (2012) analysed the influence of prenatal maternal representations, and the way these representations change after birth, on Emotional Availability (EA) among drug abuser mothers and their Infants. Drug abusing mothers had more negative prenatal representations of themselves and about the child’s father. They concluded that these mothers tended to idealize their first infant during pregnancy, and that after birth, they continued idealizing the baby or become disappointed with it.

Disappointment or idealization, predicted EA problems. For all mothers, negative representational change was detrimental for EA. These results have clinical implications as (Flykt et al, 2012) both negative and idealized prenatal representations, constitutes a risk for future parenthood in high risk mothers. Negative prenatal expectations of motherhood, may indicate a lack of sufficient maternal attachment and of protectiveness toward the baby. On the
other hand, excessively high expectations of motherhood, can lead the mother to see the baby as a saviour of one’s life (Belt & Punamki, 2007). When the child is born there is a confrontation between idealization and reality in mothers that have also a poor affect regulation, what may lead to negative hostility feelings toward the baby and to intrusive interactive behaviour (Twentyman & Plotkin, 1982), which may end in child abuse (Lyons Ruth et al, 1987).

2.5. Conclusions

Although maternal-fetal attachment is not yet a well operationalized concept, the MFAS can be considered a useful measure to evaluate mother expectations and investment on her baby to born and also for studying determinants and outcomes of MFA. Methodological problems limit the comparison of data as many studies used small size samples, had an exploratory character or used different selection criteria. There is still a lack of studies with high risk populations evaluating the consequences of a weak maternal-fetal attachment.

The studies about the determinants of MFA are not very conclusive, Social support was the most decisive socio-demographic determinant of MFA, but its effect was only moderate. Anxiety and depression proved to be relevant predictors but not in all studies. Self-esteem and self-control were not consistent and sense of coherence proved to have a weak positive correlation in low risk, but not in high risk women. The influence of other socio-demographic factors was not conclusive and for researchers maybe some of them are interacting.

A strong conclusion is that MFAS increases during pregnancy, which means that clinicians should be cautious on the interpretation of values obtained in the beginning of pregnancy. MFA is correlated with health practices during pregnancy, that will influence later the duration of pregnancy or baby outcomes, MFA is also positively correlated with maternal skills in postpartum and at 1 and 8 months after delivery in women at high risk (but not in low-risk women) and finally some promising studies describes the impact of MFAS on mother-child relationship.

In evaluating its value, we have to take into account that MFA by definition is not directly observable and we are bound to the use of representative measures to study MFA. Maybe these difficulties, associated to the fact that according to their personality traits, mothers project in their babies their wishes or fears, could explain some of the contradictory results that were found in research.

That does not decrease the relevance of the concept for the future mother-baby interaction, challenging the development of new research to operationalise the concept.
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PART I
THEORETICAL FRAMEWORK

CHAPTER 3
MOTHER-BABY RELATIONSHIP
3. MOTHER-BABY RELATIONSHIP

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3.6. Conclusions
3. MOTHER-BABY RELATIONSHIP

3.1. Attachment theory

In his first books Bowlby (Bowlby 1969, 1973, and 1980) hypothesized that the way children trust in the world, and their later capacity for empathy and responsiveness to their own children once they become parents, are influenced by the degree to which they had been in an attachment relationship with a caring, sensitive, and responsive adult. The newborn babies are biologically predisposed toward establishing a proximity relationship with the parental figure (usually the mother), guaranteeing survival; attachment is an innate behaviour that aims at the establishment of an affectionate link between the baby and his mother. Attachment gives place to feelings of love, security, and contentment, whereas separation gives place to concern, anxiety, and depression. Attachment refers to an affective bond between an individual and an attachment figure. Such a bond is based on the child’s need for safety, security, and protection. The children attach to caregivers instinctively, for survival and ultimately for genetic replication. The biological aim is survival, and the psychological aim is security. Human beings possess a biologically based attachment system that is activated as soon as an external or internal danger appears. Bowlby rejected psychoanalytical explanations for early infant bonds, including “drive theory”, as in Psychoanalysis the motivation for attachment comes from gratification of hunger and libidinal drives.

One fundamental aspect of his theory is the focus on the biological bases of attachment behaviour. This behaviour has the predictable outcome of increasing the child’s proximity to the attachment figure. The infant’s repertoire of proximity-promoting behaviours (vocalizing and cries, approaching and clinging) becomes organized into a behaviour system (the attachment system) focused on a specific caregiver, usually the mother. The attachment system includes the form of attachment itself, the exploratory system, the social system, and the caregiver system. The caregiver system is the complementary system developed by the attachment figure. Each individual experiences emotional ties to the other and forms an internal representation - what Bowlby called an “internal working model”—of the relationship and its participants. This will influence the child’s later development and his future relationships.

3.1.1. The Strange Situation

Mary Ainsworth developed transcultural research analyzing mother-baby relationships in Uganda and Baltimore. She and her collaborators created a procedure, a standardized interview to assess the quality of attachment in infancy, the Strange Situation (Ainsworth, et al. 1978). Strange situation (SS) is an instrument to assess observed attachment. This
methodological procedure signalled a new era in research. She also introduced the concept of “secure base.”

The SS, as formulated in Ainsworth et al. (1978), was designed to observe children between nine and eighteen months of age, and made possible the creation of the first classification of attachment (secure, avoidant, and anxious). During the procedure, the child is observed playing for twenty minutes, and during this time, the situation changes in degrees of stressfulness and the child’s response is classified and measured. Main and Solomon (1986) identified a fourth pattern, the disorganized attachment. Later, Cassidy and Marvin (1992) adapted this instrument for older children. As has already be said SS is an instrument to assess observed attachment.

3.1.2. Attachment classification

The SS was the base to classify the quality of attachment. Ainsworth et al (1978) described initially, three groups of children with different behavioural organization:

- The insecure-evitant group (A) characterized by the baby evitant behaviour to the attachment figure, especially in the episodes of reunion, when he ignores her or kept away, and for the undifferentiated way as he treats a strange or his attachment figure.
- The secure group (B) characterized by the active search of proximity and interaction with the attachment figure, especially in the reunion moments.
- The insecure-ambivalent /resistant group (C) characterized by the existence of active resistance behaviour to contact associated to a searching to contact with the attachment figure. This active search to contact inhibits or difficult exploration.
- Later Main and Solmon (1986) introduced a fourth group, the disorganized / disoriented group (D) characterized by the simultaneous or sequential contradictories behaviours, asymmetrical and inappropriate movements, stereotypes, signals of apprehension to the attachment figure, confusion and disorganization. This type of Attachment is commonly associated with maltreatment, as 80 % of maltreated infants are classified as disorganized (the most concerning pattern) as opposed to about 12 % found in non-maltreated samples. Only about 15% of maltreated infants are likely to be classified as secure.

3.1.3. Internal working models

According to attachment theory, during the first year of life, children develop representational models of their interactions with attachment figures and of corresponding affects that Bowlby called “internal working models.” As Bretherton and Munholland (1999) explain, along the
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development, the internal working models become increasingly stable. Individuals develop a particular kind of attachment, with peer relationships at all ages: romantic and sexual attraction and responses to the care needs of infants or the sick and elderly. Early experiences with caregivers gradually give rise to a system of thoughts, memories, beliefs, expectations, emotions and behaviours about the self and others. This system, called the “internal working model of social relationships”, continues to develop with time and experience. Internal models regulate, interpret, and predict attachment-related behaviour in the self and the attachment figure. Principles of attachment theory have been used to explain adult social behaviours, including social dominance and hierarchical power structures, group coalitions, and negotiation of reciprocity and justice. Those explanations have been used to design parent-care training and have been particularly successful in the design of child abuse prevention programs.

Moving from a behavioural assessment of attachment with SS to a more representational assessment, the Adult Attachment Interview – AAI (George, Kaplan & Main 1984) was developed as a measure to assess internal working models in adults. This instrument characterizes the way adults establish attachment relationships, which is related to their previous experiences (George et al. 1984–1986). AAI was fundamental in the development of research and understanding on adult attachment. The identification of adult patterns of attachment similar to those existing in babies, allows the comprehensive exploration of transgenerational transmission of attachment.

3.1.4. Adult attachment classification

The system developed by Main and Goldwyn (1984, 1998) to classify Attachment in the adult, defined categories similar to those developed with the SS:

- Secure /autonomous in what relates attachment (Group F) – Adults with a secure attachment who value attachment relationships.
- Insecure/ detached (corresponding to insecure /evitant) (Group D) – Adults that reject or depreciate relationships and experiences related with attachment.
- Insecure /enmeshed or worried with attachment (corresponding to insecure resistant ambivalent) (Group E) – Adults confused, incoherent in what concerns relationships.
- Non resolved / disorganized (U/d) – Adults that suffered traumatic experiences with attachment figures (lost or abuse), and that have non resolved problems or contradictory feelings with their attachment figures.
3.1.5. Measures of Attachment in different contexts

Other instruments to measure attachment in different contexts, have been developed during the last decades: Waters and Deane (1985) developed the Attachment Q-set to evaluate attachment between one and five years, and Main and Cassidy (1988) developed an instrument for children up to six years old. The Preschool Assessment of Attachment developed by Crittenden (1992) assesses the patterns of attachment between eighteen months and five years old. Other researchers like Hazan and Bartholomew developed instruments to evaluate adult relationships, namely romantic love (Hazan & Shaver, 1987; Bartholomew and Horowitz, 1991). Regarding the issue of whether the breadth of infant attachment functioning can be captured by a categorical classification scheme, continuous measures of attachment security that have been developed, demonstrated adequate psychometric properties. These have been used either individually or in conjunction with discrete attachment classifications in many published reports.

Different opinions exist about the way attachment is measured and classified. For example Fraley and Spieker (2003) argue that the variation in attachment patterns should be continuous and not categorical.

In Portugal a great contribute has been done by the Attachment Studies Group coordinated by Soares, as they have adapted to Portugal several instruments to be used on clinical practice and research. This group been particularly interested on studying adolescents and their mothers' attachment representations, on adult intimate relationship, in high risk groups and in clinical research, namely in eating disorders (Soares 2007). More recently they have been more focused n the case of adopted and institutionalized children (Soares, 2014; Baptista, 2013)

A relevant point is the universality of the concept and also the possibility of using these instruments in different cultures. As we referred before, Mary Main was pioneer on developing transcultural research analyzing mother-baby relationships in Uganda and Baltimore. The research has proved that the classifications have been consistently coded across different cultures (van IJzendoorn and Kroonenberg, 1990).

3.1.6. Stability of Attachment

A meta-analysis of the studies about the stability of attachment from infancy to early adulthood (Pinquart, Feubner & Ahnert, 2013) led to the following conclusions: the stability of secure attachment in the first years of life is moderate; higher stability coefficients are found to be more stables on toddlers when it is possible to use representational assessments for internal
working models; children with secure attachment are prone to stability compared with children
with insecure attachment since they don’t have to deal with risks; there is not sufficient
evidence for correlation stability of secure attachment in periods over 15 years; the low to
moderate stability of attachment security, indicates that it is malleable and that it’s possible to
improve it.

This final conclusion is of great relevance to the development and validity of intervention
programmes raising the question if we can promote or reinforce attachment. According to the
results obtained by Hayes, Goodman and Carlson (2013), enhancing maternal parenting
behaviours during early life, has the potential to alter pathways to disorganized attachment,
among infants that were exposed to antenatal maternal depressive symptoms. So, we can
conclude that attachment can be promoted and modified.

3.1.7. The contribute of longitudinal studies

Other relevant contributions to the development of this theory were the longitudinal studies that
allowed researchers to understand the implications of attachment, deprivations of care, or
foster situations in development, future relationships and attachment. Multiple evolutions in the
development of evaluation procedures on babies, caregivers and the type of relationship have
emerged.

Several longitudinal studies had great relevance to the study and understanding of the
attachment processes and development, the balance between risk and protective factors, and
also transcultural questions. In these studies it is clear that attachment security has an impact
on personality development in adolescence and later in psychopathology. The most relevant
studies include Grossmann et al (2002), with middle-class children in Germany, first in
Bielefeld and then in Regensburg, and Sroufe et al. (2005), with children from a high-risk
sample, the Minnesota study, for more than thirty years.

Sroufe et al (2005) have shown that security of attachment is related with later self-esteem,
emotional control, and social competencies. In these studies it was emphasized that mothers’
and fathers’ interactions with children powerfully predict later representations of relationships,
some assessed fifteen to twenty years later. Relationship with psychopathology will be
described later.
3.1.8. Implications of Attachment for child development, personality and relationship with others

There is a large network of researchers studying the relationship between security of attachment and implications for child development. These findings have important implications for health promotion programs, focused on attachment. The enhanced capacities of secure children to create and maintain more intimate close relationships with peers and other partners may derive in part from aspects of their social cognitive skills, including the capacity to think about and understand their emotions. Secure attachment has a positive effect on memory organization (Belsky, 1996).

Secure attachments have positive implications in personality development (Sroufe 2005), like better strategies to deal with anger (Gilliom et al, 2002), better emotional regulation in adolescence (Kerns et al 2007), a better sense of self-worth (Cassidy et al 2003), an increased ability to identify emotions in others (Raikes & Thompson 2006) and understanding of their own self (Steele et al 1999).

Slade (1987), Frankel and Bates (1990), and Schneider, Atkinson and Tardif (2001) explored the relationship between the quality of early attachment and the capacity to establish other relationships. These studies found that children with secure attachment developed more successful and helpful close relationships with their parents and their peers than did insecure children, and that they had better strategies to cope with conflicts and emotions. Some of these correlations seem to be moderated by gender. One area of emerging interest is the relationship between security attachment and the establishment of relationships in adolescence and adulthood. Adolescents have to establish new relationships, namely with their peers and reanalyse their attachment pattern, contributing to a new organization of attachment in adulthood (Soares, 1996; Mendes et al, 2011). An interesting area is the case of romantic love. The idea that couple relationships can be understood by means of the attachment principles has been widely disseminated and many authors are investing in this research area (Roisman et al 2002). The pioneering studies in this area were from Hazan and Shaver at 1987 and more recently Hazan et al (1994)). More research is needed on these topics as many questions remain.

3.1.9. Implications of Attachment to a country - the question in immigrants

Cross-cultural studies are remarkably consistent with theory, suggesting a balance between universal trends and contextual determinants in the way attachment is being established (Van Ijzendoorn & Sagi 1999) in different cultures. In a review of the first 10,000 AAI was
Theoretical framework

demonstrated that AAI distributions are independent of the language and country of origin (Bakermans-Kranenburg & van IJzendoorn M, 2009).

Immigration introduces new challenges in the adaptation capacity of someone who decides to live in a different country than the one where he was born and raised. The challenges of this process can also be understood using the attachment theory.

One of the most important groups that everyone belongs to is a nation. National identity is a part of social identity (Tajfel, 1982) which includes a set of cognitions and emotions that reflect the individual connection with a nation (Blank & Schmidt, 2003). Attitudes toward a country reflect the individual’s general evaluation of the country as well as the individual’s positive or negative emotions, such as pride, love, comfort, shame and disdain. In terms of attachment theory, national identity reflects the individual’s internal representation of the country and the attachment dynamics between the individual and the country of his or her living (Davis, 1999).

Immigrants have to face a challenge in assuming both identities, as they belong to a country where they were born and to another where they live. Research has shown that the ability to form a multi-faceted identity which incorporates a connection to both countries (integration) is linked to both mental and physical health in immigrants (Berry & Kim, 1988; Virta, Sam & Westin, 2004). Walsh and Tartakovsky (2012) suggest that for adolescents (when identity is in a maturating process) the internal representations of their mothers and their origin countries, are important for understanding the dynamics of adolescent attachment to social objects and their psychological adjustment. For these authors, it is possible to talk of “attachment to a country” as an extension of the concept of “attachment to culture” on the one hand (Hong et al, 2006) and “attachment to a group” on the other hand (Davis, 1999). A country can be conceptualized as a social object to which an attachment relationship, including internal representations, is developed. For adolescents, internal representations of their mothers were related to representations of their country. The results of this study, showed that adolescents developed attachment to both their country of birth and to the one where he lives, following immigration. Among non-immigrant adolescents, maternal representations remained a significant predictor of the adolescent’ adjustment, together with the internal representation of the country, while in adolescents immigrating without their parents, internal representations of the new country for living, fully suppressed the effect of maternal internal representations on psychological adjustment. These findings suggest that the effect of parental internal representations on the adolescent’ adjustment may differ depending on the physical distance between the adolescent and their parents. When they continue near them, the effect of primary attachment may be stronger, while when an adolescent who is physically distant from their parents, the new personal and social attachments may become predictors of its psychological adjustment.
3.1.10. Attachment and psychopathology implications

Bakermans-Kranenburg and van IJzendoorn (2009) review of the first 10,000 AAI, has demonstrated that there are differences in AAI that depend from the existence of psychopathology in adults. Clinical subjects showed more insecure and unresolved attachment representations than the control group. Disorders with a more internalized dimension, as border-line personality disorder, were associated with more preoccupied and unresolved attachment, whereas disorders with a more externalized disorder (anti-social personality) displayed more dismissing as well as preoccupied attachment. Depressive symptomatology was associated with insecurity but not with unresolved loss or trauma, whereas adult with experience of abuse in the past or post traumatic stress disorder, were more frequently unresolved.

Many authors dedicated their research to study the implications of early attachment in later psychopathology. As we have described earlier, the Minnesota parent-child project coordinated by Sroufe in 2005, has followed a sample from infancy into early adulthood, and assessed psychological functioning, social competences and psychopathology, throughout life. Follow-up assessments were made in the preschool years, in the elementary school years, in the preadolescent period, and in adolescence. Different analysis from these data substantiated a relationship of the quality of attachment with aggression and maladjustment. These results were reproduced by Carlson (1998), and by Renken et al (1989), that found differences according to sex. Ambivalent attachment seems to be modestly associated with later anxiety disorder, as discussed in Warren et al (1997). Other studies didn’t support consistently these differential pathways, creating some controversy.

There are insufficient longitudinal data from infancy to establish with certainty that specific pathways exist between the different types of attachment and specific psychopathology. Attachment insecurity seems to be a relevant but nonspecific factor that increases the risk for several forms of childhood psychopathology (Moss et al. 2006).

A more specific question is the implication of disorganized attachment in later psychopathology and its determinants, like child abuse or maltreatment. As was mentioned before, about 80% of maltreated children are classified as disorganized as opposed to about 12% found in non-maltreated samples. Only about 15% of maltreated children are classified as secure. Children with a disorganized pattern in infancy tend to show in their future markedly disturbed patterns of parenthood (Schaffer, 2003) and marked disturbed social relations (Spangler & Grossmann, 1993). Disorganized attachment is predictive of problematic stress management (Willemsen-Swinkels et al, 2000), externalizing behaviour problems (Lyons-Ruth et al, 1997; van IJzendoorn & Sagi, 1999), and higher rates of dissociation in adolescence.
(Carlson, 1998). We can say that disorganized attachment is associated with later psychopathology (Lyons-Ruth & Jacobvitz 1999), explaining the transmission of pathological patterns from one generation to the other. However this association seems to be a nonspecific risk (Berlin, Zeanah & Lieverman, 2008).

3.1.11. Biological Findings

Many questions remain, concerning the psychobiological and genetic origins of attachment and brain neuroplasticity. A corollary to this principle is that there are certain periods during early development when experiences have a more significant effect than during others. These periods, called sensitive or critical periods, are thought of as windows of opportunity during which certain types of experience have a foundational effect upon the development of skills or competencies. This might also apply to the outcome of educational or preventive interventions provided during such periods. Fox and Hane (2008) found that early life events can exert a powerful influence on both the pattern of brain architecture and behavioural development. Variations in phenotype reflect the influence of environmental conditions during development on cellular functions, including that of the genome. The recent integration of epigenetic into developmental psychobiology illustrates the processes by which environmental conditions in early life structurally alter DNA, providing a physical basis for the influence of the perinatal environmental signals on phenotype over the life of the individual as mentioned by Meaney (2010). The understanding of the nature and nurture within developmental science has evolved with alternating relevance of one or the other, as primary explanations for individual differences in life-course trajectories of success or failure. Sameroff (2010) proposes a unified theory of development to integrate personal change, context, regulation, and representational models of development. Fox and Hane (2008) analyze the relationship between autonomic responses, attachment, and temperament.

Adult attachment representations predict cortisol and oxytocin responses to stress (Pierrumbert et al, 2012) presenting specific patterns according to attachment classifications. According to theses authors, autonomous attached parents reported low subjective stress and presented a moderate response of the hypothalamic-pituitary-adrenal (HPA) axis (ACTH and cortisol) and a high level of oxytocin. Parents with a dismissing attachment reported a moderate subjective stress, an elevated response of the HPA axis and moderate levels of oxytocin. Subjects with a preoccupied classification presented moderate levels of subjective stress and HPA response, and a relatively low level of oxytocin. Parents with an unresolved classification had elevated subjective of stress, a suppressed HPA response, and a moderate level of oxytocin. They concluded that attachment representations may affect stress responses.
and suggest a specific role of oxytocin in both, in the attachment system and in the stress system.


New advances have been made recently, valuing the role of specific structures like the amygdala, which hyperactivity in insecure parents, seems to be one of the mechanisms underlying negative emotions when they are exposed to the infant crying, and could explain why insecure parents respond inconsistently to infant signs or reject them, limiting their possibility of a secure attachment (Riem et al, 2012).

What is becoming more relevant, is the intention to bring attachment theory from his primary field in the developmental emergence of social expectancies, to a broader conception of attachment as an organizer of physiological and brain regulation (Sroufe, 1996). Using the expression of Siegel (1999) the brain is “experience-expectant” and the research in next years will focus on gene expression.

The studies with twins also highlighted new results in this field. Maternal sensitivity was found to show little evidence of genetic effects, and shared environmental effects on sensitivity were found to be significantly correlated with shared environmental effects on attachment (Fearon et al, 2006).

3.1.12 Conclusions

Attachment Theory is a widely well developed field that serves as basis to understand mother-baby interaction and the way it offers a basis to child development. It has multiple applications in different contexts, like in romantic and sexual attraction, responses to the care, needs of infants, or sick or older people, or even in the way someone is linked to a country. It’s influence on personality maturation and relationship with others that has been proved. The pattern of attachment (and specially disorganized attachment) influences the emergence of psychopathology. Recent studies have highlighted the psychobiological and genetic origins of attachment and brain neuroplasticity. It’s a unitary theory that can easily support intervention programmes, as improving the security of mother’s baby attachment will have a large impact on the future of the child.

More studies are necessary to clarify this promising and challenging area of research, concerning the psychobiological and genetic origins of attachment and brain neuroplasticity.
3.2. How is Attachment transmitted from one generation to the other?

3.2.1. Transgenerational transmission of attachment

Of great relevance for the understanding of the mechanisms of attachment are the studies that try to understand how attachment is transmitted from one generation to the other. The results of these studies are a strong contribute for the design of intervention studies.

The different contributions for the understanding of transgenerational transmission of attachment are organized in the transmission model (van IJzendoorn 1995), a framework that allows the researchers to consider and test hypotheses. According to the transmission model, parenting behaviours contribute directly to the quality of child-parent attachment and are largely driven by parent’s internal working models of attachment.

Parent’s internal working models drive parenting behaviours and the quality of child-parent attachment, by guiding them in the way they interact and answer to the child’s needs (Main & Hesse, 1990). A sensitive supportive parent is open to a full range of needs of the baby, and responds contingently to these needs (Ainsworth et al, 1978). An insensitive, less supportive parent distorts or misrepresents the child’s needs and answers in an inadequate way. Parent’s internal working models are determinant for the security of the child’s attachment to the parent. The ideal dyad is a secure child-parent attachment characterized by the parent’s internal working model of the child as a secure base from which to explore (Ainsworth, 1963)

A study evidenced this hypothesis showing that adults, whose mothers had held negative perceptions of them as newborns, would be more likely to be classified as insecure on the AAI, than adults whose mothers had a positive perception of them as a baby (Broussard & Cassidy, 2010).

3.2.2. The role of sensitivity

Many studies have tried to produce a better understanding of the fundamental antecedents of attachment, in particular the relation between mother’s sensitivity and attachment of the baby. These antecedents are very relevant in the organization of attachment promotion programs, as they can have different targets.

During the Baltimore longitudinal project, Ainsworth, et al (1978) assessed different dimensions of maternal behaviour. Four rating scales (sensitivity, acceptance, cooperation, and accessibility) were found to be strongly related to attachment security. We focus here on parental sensitivity, found to be a major determinant of attachment. According to Ainsworth
(1974), parental sensitivity refers to the ability to perceive infant signals, to interpret them correctly, and to respond to these signals promptly and appropriately.

Other authors (Mesman, van IJzendoorn & Bakermans-Kranenburg, 2012) suggested that sensitivity does not rely only on reading discrete negative emotions in the child signals, but on an integration of complex, graded distress expressions with contextual factors and interactive interaction processes. A sensitive parent picks up on the subtle gradations and variants of infants’ distress signals and recognizes when dyadic regulation is needed. Baby signals, like crying, facial expressions or bodily movements do not tell the parents about the specific causes of distress or negative emotions, but evolve the sensitive parent in action, trying to understand what the child needs, even when they are subtle, averting full-blown distress, regulating her emotions. These conclusions are relevant to intervention, as they validate the importance of recognizing subtle distress signals, their interpretation and the need to teach appropriate responsiveness. Interventions promoting recognition signals and contextual understanding have good results, and are found to enhance sensitive responsiveness and increase sensitive parenting (Bakermans-Kranenburg, van IJzendoorn & Juffer, 2003).

3.2.3. The transmission gap

The transmission model has been tested and, surprisingly, the researchers found only a moderate association between sensitivity and security attachment (de Wolff & van IJzendoorn, 1997). Parenting behaviour accounted for a relatively small proportion of the association between parental working models and child attachment security (van IJzendorf, 1995). The data did not support the model whereby parenting behaviours serve as the principal link mechanism between parents’ working models of attachment and their children’s attachment to them. Van IJzendorm called this phenomenon the transmission gap, a reference to the fact that measured sensitivity does not fully account for the link, as some have anticipated, between a mother’s own state of mind regarding attachment and infant attachment security.

There are plausible explanations for the transmission gap, like the inadequacy of the theory construct, inadequate parenting measures, or inadequate conditions for their reassessment that are being investigated.

For some authors these complex transactions should be observed taking into account the social context, the way sensitivity is measured, and the influence of stress on parental evaluations. They suggest to pay more attention to nonshared environmental influences, as in normal settings, sensitivity is an important but not exclusive condition of attachment security. It seems that it is the combination or accumulation of unfavourable circumstances that negatively affects the mothers’ sensitivity.

For Berlin (2005) attachment theory has to move to a contextual level, in a broader conceptualization and in conjunction with other factors. The same idea has been defended by
Belsky (1999a), and Belsky, Rosenberg and Crnic (1995). As will be described later, a number of studies links factors as family stress, parental mental health, marital quality, social support, and child health, to parents’ internal working models, parenting behaviours and child attachment. As an example, Isabella (1994) proved that, prenatal marital quality predicted mother’s role satisfaction, which in turn improved maternal sensitivity and infant-mother attachment.

These broader findings support and complement the transmission model, illustrating indirect effects of other factors on attachment, through internal working models (Belsky, 1999a, Belsky, Rosenberger and Crnic, 1995, Berlin & Cassidy, 1999).

3.2.4. The contribution of intervention programs

All these findings allowed researchers and clinicians to design and implement multiple intervention programs that have been evaluated. Experimental studies are relevant at least in two ways: first, non-experimental studies seem to dominate the field of parenting and child development. Much of the knowledge about parenting and development is derived from descriptive cross-sectional or longitudinal studies. Evaluating interventions programs using experimental designs could help to test the construct validity. Second, such studies may also demonstrate optimal ways of changing human attitudes, mental representations or behaviour, and confirm or falsify causal hypotheses that need to be tested.

Since 1980, prevention and intervention programs designed to support early attachment security have proliferated, with a lot of controversies about their effectiveness. According to Berlin (2005) intervention programmes to enhance early attachment can have as task, the changing of the parent’s internal working models. Through the establishment of a therapeutic relationship, the therapist should offer himself as a secure base for the parent, promoting the parent’s secure attachment to the therapist what becomes the key of therapeutic change. That will change parenting behaviours to the child and facilitate a more secure attachment between mother and baby.

A unified field is difficult to achieve, as some controversy has emerged in evaluations of program effectiveness. Egeland et al argued that “more is better” after reviewing attachment programs addressed to change internal working models and parenting behaviours. They conclude that using lengthy, intensive, and carefully timed strategies, especially with multiple-risk families, will lead to better outcomes (Egeland et al. 2000). They argue for precise tailoring of programmes according the specific needs of population. In opposition, Bakermans-Kranenburg, van IJzendoorn and Juffer (2003 and 2005) concludes that “less is more” after conducting a meta-analysis of twenty-nine studies. They found that less broad interventions that only focus on sensitive maternal behaviour appear rather successful in improving
insensitive parenting as well as infant attachment insecurity. Berlin et al (2005) evaluated all the programs and concluded that when the focus was on attachment security as an outcome, the programs have been moderately successful. When the focus was on improving either attachment quality or maternal sensitivity, the field has been highly successful. Berlin and her colleagues concluded that whether less or more intense services are better, they both can be true, as “less is more” for some families whereas “more is better” for others. Berlin et al (2005), in another meta-analysis on prevention of disorganized attachment, concludes that focusing on maternal sensitivity is more effective than providing support and targeting parents’ working models.

Egeland et al (2000) reviewed 15 intervention programmes divided in four groups 1) those designed to enhance sensitivity, 2) those designed to change parent internal working models 3) those designed to provide and enhance parent’s social support 4) those designed to enhance mother’s mental health and well being. In this review he concluded that no one type of program was more effective than others in promoting child attachment and also argue that “improving sensitivity may not be enough to change the quality of attachment”

Other studies supported the utility of the concept of Reflective Functioning that will be described later. The multidisciplinary home-based intervention “Minding the Baby” (Sadler et al 2013), using home-visits with a mentalizing-based intervention to promote maternal reflective functioning, had promising results. These results reinforce the literature that links intergenerational transmission of attachment to maternal reflective functioning (Fonagy et al 1995; Slade et al., 2005).

3.2.5. Reflective functioning

Early theory of attachment, met with criticism of the theory’s lack of congruence with psychoanalysis. Fonagy et al (1991) attempt to bring attachment theory and psychoanalysis into a closer relationship through mentalization, or theory of mind—the capacity of human beings to guess with some accuracy what thoughts, emotions, and intentions lie behind behaviours as subtle facial expression, and more broadly a crucial human capacity that is intrinsic to affect regulation and productive social relationships (Fonagy et al 1991a).

This connection between theory of mind and the internal working model may open new areas of study, leading to changes in attachment theory.

Reflective Functioning (RF) refers to an adult’s capacity to understand one’s own or another’s behaviour in terms of underlying mental states. According to Fonagy et al (1995a), it refers to the mother’s capacity to hold complex mental states in mind, that allow her to hold her child’s
internal affective experience in mind, and to understand her child’s behaviour in light of his mental states like feelings and intentions. When the mother gives meaning to his affective experience and represents this experience to him, in a regulated relationship, she sets the foundations of a sense of security, and safety for the child. RF is the core capacity that allows parents to a flexible and coherent access to emotions and relevant memories. According to Fonagy and Target (2005), RF is mentalization measured in the context of attachment. Fonagy reframed the notion of attachment security, and in particular of metacognitive monitoring (Fonagy et al, 1991, 1995a b). He was inspired for psychoanalytic concepts like affect regulation and intersubjectivity and for cognitive theorist concepts like intentionality. Contrary to Main who has focused on the cognitive appraisal processes in the development of thinking about someone, Fonagy et al (1995 a b) value interpersonal and intersubjective mechanisms in thinking about mother’s own and others’ internal, mental and explicitly affective experience. They conceptualize that, for transgenerational transmission of attachment parents should have the capacity to think about feelings and their relations to behaviour. For Peter Fonagy (2002), RF is the set of mechanisms for processing intersubjectivity and interpersonal experience.

Slade (2005), advanced a new formulation of adult attachment, linking adult attachment classification and parental RF about the child into a single model. These authors include RF construct along a dimension from organized-secure to disorganized-unresolved attachment. Dismissing and preoccupied attachment was placed towards the lower end of reflectiveness, but orthogonally to security-reflectiveness; disorganization occurs at the lowest level of reflectiveness. According to Slade et al (2005), the relations between adult attachment and parental RF are significant, and the same happens between parental RF and infant attachment. The outcomes of a preliminary mediation analysis, suggests that RF plays a crucial role in the intergenerational transmission gap.

Using the same concept and its new formulation, Grienenberger, Kelly and Slade (2005), concluded that the level of disruption in mother-infant affective communication (using AMBIANCE that measures the quality of mother-infant affective communication) was inversely related to the level of maternal RF. Mothers with a low quality of affective-communication, were more likely to have infants classified as disorganized or resistant; mothers with a high quality of affective-communication were more likely to have infants with a secure attachment. In order to better understand this phenomenon, it was made a linear regression analysis that identified maternal behaviour as the mediator between maternal RF and infant attachment. This study is a relevant contribution for a better understanding of the transmission gap. According to Fonagy and Target (1996), the mother must not only demonstrate that she understands the child’s anger, fear or distress, but also communicate this behaviourally in a
way that serves as a model for the child, showing her/him how to master the experience. Some parents would maintain a strong maternal role, demonstrating stability and mastery, while others even when they are affective, won’t keep the necessary calmness and confidence. Others would even have critical breakdowns of mirroring and mastery, and the child distress would provoke an uninterested state of mind in the caregiver. The inadequate behaviour of the mother showing her incapacity to contain the child distress and answering the child with a tranquilizer action, will hamper the organization of attachment.

This idea is in line with the “alpha function” (affect containment) introduced by Bion (1962). According to this conceptualization, the mother has to be able to recognize the disorganized signals of distress of the baby, to understand what they mean in terms of the baby’s feelings, being able to mentalize them, and then to return an action to the child that responds to her need. She needs to teach the baby how to think, creating what Bion calls “an apparatus to think her own thoughts”.

These findings are also in line with the work of Cassidy (1994), who emphasized the relevance and centrality of the regulation of negative affect in the dynamics of attachment. This question is especially relevant in parents from high risk groups, namely those with maternal psychopathology, where the container function is not enough present.

For Grienenger, Kelly and Slade (2005), the mothers who were able to reflect on their children’s affects and intentions, would be better equipped to handle infant vulnerability without becoming overwhelmed by their own unintegrated fear or hostility.

For Peter Fonagy (1996) these results support the Winnicott concept of “good enough mother” (1960) and mentalization is implied on a modulating function once the mother-infant relationship has been deregulated. He argued that “the relationship needs to be bad (in trouble), for the mother to be able to show that she is good.” These conclusions also appeal to the need of reconsider the way interaction is evaluated, including or not distress events to evaluate how mothers and babies reacts.

3.2.6. Conclusions

Although there is still a lot of discussion about the way attachment is transmitted from one generation to another, we now have different and maybe complementary explanations that could help us on our task of promoting secure attachment. Intervention programmes also have contributed to the knowledge on this field.

We can use use a more microscopic, individual look, or a more macroscopic, broader approach. In the first hypothesis we can for instance understand what happens in mother’s unconscious as is described by the concept of reflexive function or observe sensitivity; in the second macroscopic aproach, more useful in a Public Health conceptualization and
intervention, we will value other more distal factors that influence the microscopic proximal factors.

3.3. Emotional availability

The concept of Emotional Availability (EA) as will be used in this study, was first described by Emde (1980) as the individual emotional responsiveness and attunement to the needs and desires of others. EA is related with the acceptance of a wide range of emotions in a relationship, and not only to anxiety answer, as it happens for instance in the SS. It is a construct about the expression and emotional responses from both persons involved in a relationship (Emde & Easterbrooks 1985).

This concept is in line with attachment theory and the work of Bowlby and Ainsworth (Biringen 1998), as they believe that maternal sensitivity includes characteristics of emotional availability of the typical attachment figure, usually one of the parents.

Despite the central role that maternal sensitivity appears to have in the development of attachment patterns, a meta-analysis (de Wolf & van IJzendoorn, 1997) suggests the existence of other factors than maternal sensitivity, which contribute to individual differences in the type and security of attachment, namely child responsiveness and involvement in the relationship with the mother. The context in which sensitivity is assessed is also relevant. Some authors propose to study sensitivity not only in a stress-safety, protection-interaction context that is needed for the attachment system to develop well, but also in a more normal context, valuing the role of children on regulating emotional relationship.

While the attachment theory emphasizes the role of sensitivity in the caregiver when stress or danger calls the attention to protection and nutrition, EA encompasses more comprehensive aspects of behaviour that may not be central to the role of caregiver of the attachment figure.

For Easterbrooks and Biringen (2000) “EA in mother-infant interaction, would be the connective tissue of a healthy social-emotional development”. They turned the initial theoretical concept of EA into an evaluation instrument that characterizes and quantifies EA during mother-infant interaction, the Emotional Availability Scales (EAS). According to this system EA includes several components: parental sensitivity, structuring capacity, non-intrusiveness and non-hostility, and also child’s responsiveness and involvement with the parental figure.

For Ainsworth, parental sensitivity includes responsiveness to child’s signals and communications. Biringen’s conceptualization is, however, different in establishing a marked
focus on emotions and having a broader scope. Parental sensitivity refers to the awareness and ability to respond appropriately to the child's needs, creativity in play, but also to the ability of handling conflicts and to the quality of affective parent-child interaction, and especially to an appreciation of genuine or pseudo – positive affection. The concept also refers to its reverberations throughout life, and is based on observable data and is not intrapsychic in nature.

The **parental structuring** capacity refers to the ability of the parents to support learning and exploration without overwhelming the child’s autonomy. It involves providing a framework for interaction, and providing rules and regulations in a way the child is receptive. It involves providing rules, regulations, and a framework for interactions. (Biringen 2000)

**Parental non-intrusiveness** refers to the ability of parents to be available without being intrusive in the child's autonomy. The intrusiveness refers to various ways of limiting child' autonomy, interfere or prevent what the child is doing, or even stimulate excessively the child without respecting their limits.

**Parental non-hostility** refers to the way parents talk or interact with the child, without being abrasive, impatient or antagonistic. Hostility can be explicit or implicit. The explicit hostility is clearly observable and directed to the child. The implicit or covert hostility manifests itself as impatience, dissatisfaction, annoyance, whether or not directed at children.

Regarding the child EA we can consider two dimensions: **responsiveness** described as the ability to explore by her own or to answer the parents in a genuine affective and available way, taking into account the age and proper context; and the child's **involvement** that refers to the ability of the child to invite parents to play and interact. The involvement of the child corresponds to a signalizing behaviour, like looking, smiling and corresponds to the creating an interactive loop.

While attachment is usually evaluated under stress conditions, EA is typically assessed under low stress, although it is not a requirement of the construct.

In a 2000 edition of the journal Attachment & Human Development, six articles were published reporting studies that investigated the connections between EA and attachment patterns. The studied samples in the six articles research, had different degrees of psychosocial risk (unselected community sample, low-income addicts), different socio-economic conditions (low-income, upper-middle class, mixed), were from different countries of origin (Canada, Israel, USA), with children of different ages (from infancy to 7 years) and using different attachment measures across life (SS, AAI, Parent Attachment Interview).
Three of the studies document the links between EA and attachment using the SS (observed attachment) and EAS namely:

- One study assessed 12 months Israeli infants and their mothers, and reported links between EA at home, and in a SS. They found relations between attachment classifications and maternal sensitivity, structuring and child’s responsiveness and involvement, particularly among infants with secure and ambivalent patterns of attachment. It was demonstrated that higher scores on EAS were associated with infant attachment security, reinforcing the role of sensitivity as a mechanism to promote secure attachment. However in this study, EAS has been found useful in distinguishing between security and insecurity of attachment relationship, but not between different types of insecurity (Ziv et al, 2000).

- Another study using a sample of high risk of prenatally drug exposed toddlers, associated higher caregiver intrusiveness with avoidant and disorganized attachment in the child. The study used the EAS and the SS as instruments (Swanson, Beckwith & Howard, 2000).

- Attachment patterns in infancy predicted both maternal (sensitivity and structuring) and child (responsiveness, involvement) EA at age 7, particularly in children with secure or disorganized early attachments (Easterbrooks, Biesecker & Lyons-Ruth, 2000). These results support the stability of the concept and its implications for development.

The other three studies, documented the links between emotional availability and attachment assessed at a representational level, namely:

- One of the studies reported the association between maternal representations of their own attachment to their parents using AAI, and their sensitivity assessed using EAS (Oyen, Landy & Hilburn - Cobb 2000).

- The two last studies examined the links between EA and attachment from the adult’s perspective. In the first one, mothers with autonomous representations and their children were evaluated and they both demonstrated a more optimal EA in a free play in the laboratory. In the other study, it was observed that maternal sensitivity and structuring (from 18 months to 3 years of their child) predicted later mothers’ representations of their relationships with their pre-scholars children; earlier maternal sensitivity and later structuring behaviours predicted maternal representations of their children when they will have the age of 3. (Biringen et al 2000a; Biringen. et al 2000b)

The authors of EAS conclude that they do not want to propose that these scales replace the construct of maternal sensitivity at it is conceptualized by the Attachment Theory, but argue that these scales are a complementary elaboration of the work on maternal sensitivity. They
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propose that EA and Attachment are overlapping, but not identical constructs (Bretherton, 2000).

EA has also been proved to be associated with infant emotion regulation. The increase in maternal hostility is significantly associated with infant’s difficulties in regulating distress during emotion challenge, and marginally associated with difficulty in emotion regulation in the post challenges conditions, over and above the impact of emotional reactivity. Infants from less emotionally available dyads, have a higher possibility of experiencing difficulties in emotion regulation during and after emotional challenge condition than infants that are from more emotional available dyads. (Little & Carter, 2005)

Recent studies tried to prove a link between maternal and child behaviour and EA. More maternal speech was associated with higher maternal sensitivity, what is not surprising as speech is one of the major channel through which mothers interact with the baby, express affections, interpret and give answers to their needs. The observed relations of the child looking at mother, smiling or expressing negative affect (through facial expression and vocalization) were associated with infant responsiveness. Infants who are responsive have learned that their mothers are responsive.

Less straightforward are relations between physical caregiving and maternal sensitivity and between efficiency of exploration and responsiveness. The authors conclude about the relevance of decoding behaviour and understanding in context a global dyad interaction (Bornstein, Hahn, Suwalsky, & Haynes 2011). Recently, new studies prove the association between parenting and child cognitive development. Mothers’ responsive/didactic parenting, strongly predicts infant cognitive status concurrently and over time, even after controlling for a variety of maternal characteristics. The quality of mother-baby interaction was assessed by Albright and Tamis Lemonda (2002) using the Caregiver-Child Affect, Responsiveness and Engagement Scale C-CARES). Responsive/didactic parenting partially mediated associations between maternal depression and infant cognitive status at 15 months. Mothers who were lower in depressive symptoms displayed more positive parenting during play interaction with their infants, which in turn supported infants’ cognitive development. Interventions that focus on mothers’ mental health in conjunction with parenting may have an added potential for cognitive functioning of the child. This has relevant clinical implications for intervention, as the programmes should focus on mothers’ mental health in conjunction with parenting to benefit children’s cognitive functioning. It was also reported that when maternal responsive/dyadic parenting was low, intrusiveness played an important role, as a useful parent’s strategy to stimulate the baby, in a relationship where the baby would not receive enough stimulation. The absence of both responsive/didactic and intrusive parenting, was detrimental for the child in a serious way, but the authors
concluded that intrusiveness could provide children with parental stimulation in the cases where mother fail to display other positive behaviours.

But intrusiveness is not always positive. If it is associated with mothers’ negativity, the association with low responsive/didactic parenting will be detrimental for the child. High intrusiveness with high negativity might reflect hostile parenting (McFaden & Tamis-Lemonda, 2013; Albright & Tamis Lemonda, 2002). Licata et al (2013), studied mother-child interaction in low income mothers and their 7 months aged children, and according to her, intrusiveness was negatively correlated with goal encoding. She offers as an explanation the use of different instruments as she used EAS and other authors the Care-Index (Hofer et al 2008).

In the same study (Licata et al, 2013), proved that when comparing maternal emotional availability with maternal mind-mindedness (MM), only the first one was related to infant’s goal – encoding ability. These studies provide evidence for the impact of EAS on the development of preverbal infants. Mothers with a higher MM are in general more emotional available, but it’s not the MM that promotes infant’s goal encoding. According to this author these results are in line with the hypothesis that MM is a part of sensitivity (Lundy, 2003). They support Biringer’s assumption (2000) that the global affective quality is more indicative of the relationship and is more important for positive outcomes of the child than quantitative measurements like MM focusing on specific maternal behaviours.

Conclusions

We can conclude that Emotional Availability is a useful and well structured construct that is supported by growing and robust scientific evidence. But we also can conclude that Emotional Availability is a proximal focus on mother baby interaction and that we need to look for a broader model that allow us to think from a Public Health perspective and to design interventions targeted at large population groups. We need a model that integrates distal and proximal factors, risk and protective factors and that considers the relevance of adding protective to risk factors into a balanced model.

3.4. The Ecological Model

For Belsky and Fearon (2008), attachment theory is essentially a theory of micro-processes of development, emphasizing the daily interactional exchanges between parent and child, and the developing of internal working model of the child; they advocate the ecological /socio-contextual perspective that draws attention to contextual factors and processes likely to influence these micro developmental processes.
The Ecological Model is a comprehensive model proposed by Belsky (Belsky 1984; Belsky & Fearon 2008). According to this model, parenting is directly influenced by forces emanating from three determinant domains: the individual parent (personality); the individual child (child characteristics of individuality); and from a broader social context in which the parent-child relationship is embedded specifically, marital relations, social networks, and occupational experiences of parents. All these factors affect parenting, and in turn, child development. Sroufe and Rutter (1984) contributed to this model, postulating the relevance of the balance of risk and protective factors in a developmental psychopathology perspective, and later many studies highlighted that the existence of a cumulative risk predicted higher attachment insecurity (Scher & Mayseless, 2000).

A central point in this perspective is that “distal” influences (less distant like personality, or more distant like social support), exert most of their effects on the child by influencing proximal processes of parent-child interaction. This influence can be through a mediation role, and/or a moderation process.

According to Belsky and Fearon (2008), all these factors have also to be put in context, as they do not operate in an isolated way, and so we need to consider stress and supports, risk and protective factors simultaneously (Belsky 1984, Belsky & Isabella, 1988, Sroufe & Rutter, 1984). Data shows that not a single distal psychological and social-contextual factor individually distinguished secure and insecure attachment, but only when indices of personality, marital, couple/relationship quality, social support, infant temperament, occupational stressors and socioeconomic status were considered collectively (Belsky & Isabella, 1988).

The more indicators exist that put a family and a specific parent-infant dyad at risk (due to lower levels of parental psychological adjustment, poor marital/couple relationship quality, more negative and less positive parent-child interaction, less social support, more work-family stress, or lower socioeconomic status), the more likely infant-mother and infant-father relationships were to be insecure (Belsky, 1996, Belsky, Rosenberg & Crnic, 1995).

Belsky and Fearon (2008) concludes that the processes of mediation should be central to our understanding of individual differences in attachment (distal factors→Parent-child interaction→attachment security) but that we should also give relevance to the moderator ones.

There are results relating distal forces with observed mother-infant interaction (Belsky, Hertzog & Rovine, 1986) and between observed interaction and attachment (Belsky, 1984). For Belsky and Isabella (1988) no studies have yet linked distal influences to proximal processes and thereby, to individual differences in insecurity of attachment as would be required to test this thesis. She says that her ultimate goal was to link distal forces (social network, maternal
personality, marital relationship) to proximal factors (present mother-infant interaction) to security of attachment.

3.5. Understanding attachment insecurity as a risk factor within the context of Public Health Models

Attachment can be usefully understood within a broader Public Health Model. The public health model examines how mental disorders and disadaptation share common risk factors, with an understanding that multiple risk factors are related with later disorders. It is very unlikely that one or few risk factors in the absence of other difficulties will substantially increase the probability of later disorders. As numerous studies have shown, attachment insecurity in itself does not have an impact on disorder, but only in combination with other risk factors it will increases the risk for poor outcomes (Greenberg, Speltz & DeKlyen, 1993; Lyons-Ruth et al, 1997).

For Olds, the first formulations of Attachment theory says little about family or neighbourhood contextual factors that can play important roles in shaping the dyadic interaction between the parents and a child. It also provides an insufficient basis for prescribing actions that services can provide in order to change parent's behaviour, especially when parent's intrinsic motivation to empathizing with their children can be compromised by their own histories, with their own parents (Olds, 2005). Specific risk and protective factors that are malleable and that have shown to change life course trajectories of individuals, from a preventive perspective, can be more identified using epidemiological studies.

For Greenberg (2005) taking a public health perspective it is also relevant to understand which intervention model is needed in a certain context with specific characteristics and needs, to increase attachment security and produce better outcomes, including less onset of disorders. Answers are not the same everywhere and the question about the "more" or "less" cannot be understood in the abstract but only in a concrete and contextualized population.

The other relevant issue is the need to integrate these intervention programmes in the health system, in primary health care, if we want to have a real impact on the population, and not just some laboratory or individual experiences.

3.6. Conclusions

Attachment is a strong scientific field with multiple implications for future child development, personality and relationship with others. A secure attachment is the basis of a good mental
Theoretical framework

health and promoting mother-baby interaction is an excellent opportunity to intervention programmes aimed to enhance mental health and well-being.

Understanding the process of attachment and intervening to improve attachment requires a comprehension of more proximal factors, but also a broader approach that assesses the impact of more distal social conditions on attachment and how this social impact is mediated by family functioning and mother-baby interaction as predicted by the ecological model of Belsky.

Emotional availability is an useful construct to evaluate mother-baby relationship.

Finally, it is essential to understand how all this knowledge could be translated in effective interventions and measures that could reach large populations of pregnant mothers and families.
PART I
THEORETICAL FRAMEWORK

CHAPTER 4
PSYCHOSOCIAL DETERMINANTS OF MOTHER-BABY RELATIONSHIP
Theoretical framework
4. PSYCHOSOCIAL DETERMINANTS OF MOTHER-BABY RELATIONSHIP

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Theoretical framework
4. PSYCHOSOCIAL DETERMINANTS OF MOTHER BABY RELATIONSHIP

Conceptualizing (as proposed by Belsky, 1999) mother-infant interaction as a dependent variable affected by circumstances of the mother and the baby, we will analyze the relevance of different psychosocial factors that can be evaluated during pregnancy by Primary Health Care professionals. The detection of these risk and protective factors can be the basis for health promoting strategies. As this review is about the description of determinants that can be identified during pregnancy, we will not consider determinants within the child itself.

4.1. Age

High rates of depression have been reported by adolescent mothers in the transition to parenthood (Trouman & Cutrona, 1990; Deal & Holtz 1998; Hudson, Elek, Campbell-Grossman 2000; Figueiredo, Pacheco & Costa, 2007). One in two pregnant adolescents will become depressed after delivery (Leadbeater & Linares, 1992; Schmidt et al, 2006), and the younger the mother, the greater is the risk of depression (McGee et al, 1983). Although young maternal age, has been largely associated with greater risk of antenatal and postpartum symptoms, Other authors have shown that these symptoms were largely attributable to the prevalence of financial problems, unwanted pregnancy and lack of a partner, common in adolescent mothers (Rich-Edwards et al 2006).

Pregnancy in adolescence is generally associated with poverty, social exclusion, lower educational attainment, scholar and employment exclusion in mothers, and lower socio-economic status (Coley & Chase Landsdale, 1998; Figueiredo, Pacheco, Costa & Magarinho, 2006; Almeida, 1987; Stevens-Simon & Mc Anarney, 1996, Figueiredo, Pacheco & Magarinho, 2004). The same unfavourable circumstances have also been observed in the adolescent fathers (Ekeus & Chistensson, 2003).

Adolescents who become pregnant were found to have also an early beginning of sexual life, low level of information about sexuality and reduced use of contraceptive methods (Wellings et al, 1996), negative attitudes about sex (Boxer, 1992), positive attitudes about pregnancy and unrealistic attitudes about parenting (Jaccard, Dodge & Dittus, 2003). Often, pregnancy has not been planned or desirable, what can also interfere with their involvement with pregnancy and perinatal care (Crosby et al, 2003).

Frequently, and very early in their lives, these women had to face difficult circumstances like adolescent maternity of their own mothers (Zabin & Hayworth, 1993), absence of a father (Ellis et al, 2003), physical and sexual abuse (Parker, Saacken & Torres, 1993), instability, inadequacy or impaired familiar supervision (Zabin & Hayworth, 1993) and child institutionalization (Botting, Rosato & Wood, 1998). The higher the number of these risk factors
is, the higher the risk of pregnancy in adolescence. Otherwise these seem to be the real risk factors for maternity in adolescence, and the principal risk factors for negative effects observed in babies.

Adolescent pregnancy has negative consequences for both the mother and the child: half of mothers finish the relationship with the father’s child (Allen, 1998), many of them stop studying (Hobcraft & Kiernan, 1999), lose their job or reduce the possibility of professional evolution (Bynner & Parsons, 1999), live alone (Allen, 1998) or in low socioeconomic conditions (Speak et al, 1995) and have a higher risk of becoming pregnant again before 20 years of age (Furstenberg Brooks – Gunn & Morgan, 1987). They have a higher rate of obstetric problems (Irvine et al, 1997) and their children have a higher rate of prematurity and low birth weight (Simões et al, 2003). All these factors contribute to a higher rate of mortality.

Children born to adolescents, have higher rates of cognitive impaired development, low scholar level, behavioural conduct problems (Hann, Osofsky & Culp, 1996) and insecure attachment (Sussman et al, 1996).

All these factors contribute to poor outcomes in children (Osofsky et al, 1992), such as more parenting problems (Bernard et al, 1996; Han, Osofsky & Culp, 1996) and an increased rate of child abuse and neglect (Baranowski, Schilmoeller & Higgins, 1990; Brown, Cohen, Jonhson & Slzinger, 1998). Pregnant adolescents are nearly three times more likely to have an insecure attachment style (enmeshed, angry-dismissive, or fearful) than adults in general (Figueiredo, Bifulco et al, 2006). Nevertheless, their attachment style in itself does not predict attachment style of the child as most babies from adolescent mothers had a secure attachment to them (Jongenelen et al, 2006).

Adolescent mothers show less adequate parental behaviour, namely low responsivity and verbal stimulation, lower expectations about the development of their children, and they are more restrictive to their children (Zeanah, Boris & Sheeringa, 1997).

Good support and positive relationship with the partner can positively impact on the psychological adjustment of the pregnant adolescent (Piccini et al, 2002; Gee & Rhodes, 2003; Krishnakumar & Black, 2003), even more than on adult mothers. Teenage mothers frequently report more support from their origin family than adult mothers (Piccini et al, 2002). A positive mother/ grand - mother relationship characterized by autonomy and mutuality, is highly associated with good adjustment and parenting (Hess, Paps & Black, 2002). However, in some studies adolescent mothers with more familiar support show more difficulties in parenting (Contreras et al, 1999).

A 17 years longitudinal study performed by Furstenberg, Brooks – Gunn and Morgan (1987), showed that continuation to study (raising their job opportunities, and a higher socioeconomic level), a smaller number of children, and marriage before or after birth (raising economic opportunities and social support of the mother) are relevant protective factors.
Concluding, maternity in adolescence should be understood as a non-normative life event that will imply a personal and relational reorganization to achieve new expression and realization strategies, adaptable to the new situation. These mothers have to quickly change a family role. From care receptor they will became care providers to their children.

Easterbrooks, Chaudhuri and Gestsdottir (2005), evaluated EA in adolescent mothers and their child, and studied the synchrony or asynchrony between maternal and child behaviour. According to synchrony in EA, they were grouped in four different clusters, classified as low-functioning dyads, average dyads, average parenting/ disengaged infants, high–functioning dyads. They concluded that the women differed in outcomes such as depressive symptomatology, social support, and relationship with their own mothers. These results are relevant to the understanding that adolescent mothers are not a homogenous group, needing different answers according to their specific problems. However, the authors identified some limitation in the study, namely the very short time to observe interaction (5 minutes) and the need of more clear identify the role of grandmothers, socioeconomic stressors, and child temperament.

4.2. Marital Relationship

The experience of parenthood brings a lot of changes to the relationship of a couple (comparing with couples that didn’t had this experience), challenging many domains of family life, as individual sense of self, marital relationship, parent–child relationship, and extra familial relationships. Roles of man and woman within the family become also increasingly different from one to another (gender differentiation) being these differences more accentuated in women, who have new roles like breastfeeding and that traditionally, interrupt their professional life, to take care of the children. (Cowan et al.1985).

Marital relationship quality and attachment

Marital relationship quality is linked with different aspects of parenting and is predictive of a child secure attachment. For example, in depressed mothers the most relevant and independent factor for improving the quality of mother-infant relationship is marital support (Van Bakel & Riksen-Walraven, 2002; Conrad & Hammen, 1989; Hossain et al, 1994). The non-existence of marital support is associated with an increase of postpartum depression (Campbell et al, 1992). Unfortunately, children of depressed mothers frequently also have a father with an emotional disorder, as more than one third of men married with depressed mothers, have also emotional symptomatology (Downey & Coyne, 1990).
Although in all marriages marital quality declines in this period of transition to parenthood, it happens more abruptly in families with insecurely attached babies (Belsky & Pensky, 1988). Wives and husbands of families with secure attached babies judged the quality of their partnership (evaluated from the beginning of the pregnancy to one year after birth), as more satisfying than parents with insecurely attached babies. They reported lower decrease in tenderness, relative absence of quarrelling and husband’s general happiness (Gloger-Tippelt & Huerkamp, 1998). Wives who prenatally reported higher levels of marital satisfaction and lower levels of spousal conflict had children who scored higher on the Attachment Q Sort measure 1 to 3 years later (Howes and Markman, 1989). More marital conflicts – evaluated prenatally and at 3 months of age of the child – predicts less secure infant-father attachments and greater disorganization in mother-baby interaction assessed at 12 months (Owen and Cox, 1997). At one year of age, daughters (not sons) were more likely to be securely attached to their mothers when marriages were more harmonious during pregnancy (Lewis, Owen & Cox, 1988). Satisfaction with the spousal relationship has been linked to a satisfactory prenatal adjustment to motherhood (Mc Veigh, 1997).

The birth of a second child may precipitate and increase marital strain (Dunn, 1995), increasing the focus of the mother on her children, decreasing her investment in marital relationship. A greater marital harmony before a second child was born, predicts greater security (using the Attachment Q Sort) on the part of the older son, both in the last trimester of the mother’s pregnancy and up to 2 months following the birth of the younger sibling (Teti, et al, 1996). Multigravid women had significantly lower levels of maternal-fetal attachment and marital satisfaction, than did primigravid women during their third trimester of pregnancy (Nichols, Roux & Harris, 2007).

Nevertheless, other studies showed no relation between marital quality and infant-parent security attachment (Belsky 1996; Belsky, Rosenberg & Crinc, 1995a; Zeanah et al, 1993). In order to clarify these questions Isabella (1994), demonstrated that even though no direct relation between marital quality (measured prenatal) and attachment security (at 1 year old) could be discerned, an indirect pathway of influence appear to exist: higher levels of marital quality predicted greater maternal role satisfaction at four months of the child, which predicted greater maternal sensitivity five months later and so attachment security.

**Relationship of fathering with quality of marital relationship and attachment**

But it has also been proved that infants who develop secure attachment to both parents, function more competently at older ages than infants who develop only to one or have no secure attachments (Belsky, Garduque & Crinc, 1984), what highlights the importance of studying the conditions under which, and the processes by which, infants develop attachment to their fathers too.
Fathering may be more affected by marital relationship than mothering (Belsky, 1990). Fathers of infants securely attached to them experienced their marriage more positively, and fathers of secure infants were more extroverted and agreeable than fathers of insecure infants, experiencing more positive temperament ratings (Belsky, 1996). The availability of an alternative attachment figure is particularly important in some cases, as what happens in children of depressed unipolar and bipolar mothers, where father’s relationship with the mother, his relationship with the child, and his function when the mother is ill, are very important (Radke Yarrow et al, 1985). Supporting an ecological point of view is the observation that a mother with a risky development history is less likely to mother poorly, if she has a supportive marriage (Belsky & Pensky, 1988).

Despite the intense emotional reaction the birth of a child provokes in a woman, and the fact that mothers present more difficulties in adjustment to motherhood than men, probably due to the presence of more changes and need of reorganization in their lives (Canavarro, 2001), father’s emotional instability during pregnancy is frequent and relevant too. In an Australian study, 20 % of mothers and 12% of fathers were significantly distressed in the middle pregnancy (Morse, Buist & Durkin, 2000). Paternal, as well as maternal, prenatal depression, are both significant predictors for postnatal moods of both mother and father (Matthey et al, 2000). Paternal depression during the postnatal period has been associated with adverse emotional and behavioural problems in preschool children after controlling maternal depression (Ramchandari, 2005).

**Impact of marital status and single parent families**

Parental relationship status (married or not) appears to be, initially, an important factor influencing parenting behaviour, but at the end there are particular union types with certain characteristics that really account in parenting behaviours (Guzzo & Lee, 2008). The issue is that unmarried mothers even those in cohabiting unions, are generally belonging to a more disadvantaged group than their married counterparts, which seems to negatively influence their ability to adhere to what parenting experts believe is optimal. Qualitative research has indicated that parenting beliefs vary by social class (Lareau, 2003). For instances, whereas middle class parents might read multiple books on parenting and seek out the advice of professionals, lower income parents might believe that parenting is a natural process that does not require active learning.

And what happens when a parent has to raise a child alone? Compared with mothers in two parent families, single mothers experience higher levels of depression and family stress and lower levels of social support (Benzeval, 1998; Lipman, Boyle & Dooley, 2002) and access to mental health services. Children of single mothers are at increased risk of emotional and behavioural problems (Lipman, Boyle & Dooley, 2002; Lipman, Oxford & Dooley, 1996).
Although it is more difficult to be consistently emotionally available as a single parent, many single parents do a better job as a parent than when they were married. It seems that as long as parents are sensitive to their children emotional needs, family structure has only a small effect on child adjustment. Concluding, family structure is not an important predictor of an emotionally available home, if parents can maintain emotionally available relationship with their children, and children from single parent homes do not look different from those from two parents’ home (Hetherington & Clingempeel, 1992). However in some cases single parenthood could result in less parental sensitivity if this relationship is mediated by depression.

Transition to parenthood, is associated with a decline in leisure, which will have a small increase later, when women return to work. Wives who reported more shared leisure prenatally also reported more marital love and less conflict, and husbands with more independent leisure prenatally reported less love and more conflict one year later (Claxton & Perry-Jenkins, 2008).

4.3. Social disadvantages

Social disadvantages implicate usually an accumulation of risk factors. For instance, extreme poverty is likely to be associated with poor health and development problems through poor nutrition, poor medical care, inadequate housing and more daily stress. A disproportionate number of premature infants are born into families with multiple disadvantages. These disadvantages have direct and indirect effects on the baby, as resources are scarce, and the stability of family life is threatened. Thus multiple social disadvantages create environments in which development is more likely to go awry than in more comfortable circumstances. Nevertheless, significant proportions of children who grow up in high-risk circumstances receive a good care from their caregivers and have good developmental outcomes (Goldberg, 2000).

There are multiple social factors and life events that can be associated with maternal depression and with the development of child troubles, like the loss of a job or of a healthy situation, problems in couple relationship, socioeconomical problems (lack of house, poverty) monoparental families, substance abuse, and death in the family. In families in which one of the members is depressed, these factors are still more frequent than in general (Downey and Coyne, 1990). Younger women, with lower level of scholarity or low-qualified jobs, and larger families or those where a spousal partnership is absent, have more difficulties in adequate anticipation of birth (Pacheco et al, 2005).

There is also evidence that, under conditions of high social risk, attachment is less likely to be secure and stable than in low-risk conditions (Spieker & Booth, 1988). However, a review of four relatively large studies of high risk samples (Spieker & Booth, 1988) led to a striking conclusion. When known cases of maltreatment and inadequate care were removed from
these samples, secure attachment was just as frequent as in more advantaged samples. Furthermore, this was true even in the presence of risk factors such as poverty and single parenthood.

Social disadvantage does not inevitably compromise infant attachment. Rather, the extent to which multiple risks are present and the resources and supports that are available to meet such challenges, determine whether the mother (or other attachment figure) is able to provide good care. When the available resources and support are insufficient to surmount multiple problems, inadequate care can be the result.

Many studies have demonstrated the relevance of social support to mother-baby relationship. Middle class European American mothers, with more prenatal social support are more sensitive when interacting with their 3 months babies (Goldstein, Diener & Mangelsdorf, 1996); low income African American mothers with larger social networks tend to be more responsiveness in the interaction with their infants (Burchinal, Folmer & Bryand, 1996) and poor Hispanic women who receive more material resources from friends and relatives, engage in more proximal (touching, kissing, holding) and distal (vocalizing, looking) interaction with their 3 month old premature infant (Feiring, Fox, Jaskir & Lewis, 1987).

Not all the studies supported these findings and some concluded in the non-relation between social support and security of attachment (Belsky, Rosenberg & Crinc, 1995b, Belsky & Isabella, 1988; Levitt, Weber & Clark, 1986; Zeanah et al, 1993). Trying to clarify this matter, Crockenberg (1981) found that the absence of social support predicted insecure attachment, but only in the case of highly irritable babies,and Crittenden (1985 a and b) showed that in a group of infants with abusive or neglectful mothers, low social support predicted insecurity. According to these studies, social support seems to have a moderator role. Isabella’s (1994) also studied this question, concluding that attachment security is not affected by social support even when direct effects of social support do not emerge as expected. He found that high social support significantly predicted high maternal role satisfaction, and thereby quality of maternal care and attachment security. So, in this case we are talking of a process of influencing, consistent with a mediational process argument.

Further, social support enhances the capacity of the future mother to deal with social stress. As an example, depressed mothers can receive support from his partner, family, friends or professionals, but as it has already been referred partnership support is the most relevant one (Van Bakel & Riks-en-Walraven, 2002). Socio-cultural factors are also protective for the child with a mentally ill parent. A close extended family provides support, stability and confiding relationship, especially in times of stress; the availability of relatives or friends who could help to look after the child, helping the parents, can contribute as a protective factor in his development (Rutter & Quinton, 1984).

Parents who are mature, married to supportive spouses, have adequate incomes, and few external stressors are more likely to manage the care of difficult newborns than those parents
without these resources. Unfortunately children with subtle neurological vulnerabilities are more likely to be born into households where these salutary conditions are absent, multiplying the likelihood that caregiving will be compromised (Goldberg, 2000).

4.4. Migration

“Among all the changes a person can face during his or her life, few are so wide and complex as those which take place during migration.” (European Union 2004)

Migration is like a grief process and migrants can lose family and friends, language, culture, homeland, loss of status, loss of contact with the ethnic group and exposure to physical risks. According to European Union Report the health of immigrants in their host country depends on labour and economic instability, cultural and social marginalization, pressure to send money, racial discrimination and lack of statutory documentation.

Although the heterogeneity of this group, the balance between what they win and what they lose, taking into account their mental health and competences to cope, and their social support, will be decisive to the final result.

As we can easily understand, migrant families are many times in risk, and the way they live maternity can be difficult.

Migration is a risk factor for depression during pregnancy and after delivery (Dankner et al, 2000; Rubertsson, et al, 2005; Goyal, Murphy & Cohen, 2006). For example Zelkowitz et al, (2008), found that 37.7% of migrant woman in Canada had a high level of postpartum depressive symptoms i.e. a score above cut point in EDPS; Cox, Puckering, Pound and Mills (1987) identified depression in 42% of migrant women. These women had been symptomatic during pregnancy, what may have had an effect on marital relationship and on mother-infant relationship, affecting breastfeeding or its continuation. Prenatal depressive and somatic symptoms as well as marital quality were the best predictors of postpartum depressive symptomatology in immigrant mothers. In mothers whose family remained in the origin country, marital relationship is the crucial support factor. Immigrant women who immigrated more recently are at lower risk. Women who have a personal or family experience of trauma in their origin country, may also be at greater risk, which may manifest primarily by physical symptoms and worries about postpartum adjustment, rather than symptoms of depression.

In conclusion, immigrant women with relatively few somatic complaints, low levels of perinatal stress and satisfactory marital relations were less likely to exhibit mental health problems during pregnancy and postpartum. Women who reported postpartum depressive symptomatology did in fact exhibit several predisposing risk factors during pregnancy: many somatic complaints, high perinatal anxiety and premigration stress. Sensitive parenting predicts secure attachment across cultures (van IJzendoorn & Sagi-Schwartz, 2008) as well as
positive cognitive development, social behaviour and emotion regulation (Mesman, van IJzendoorn & Bakermans-Kranenburg 2012). In some studies, ethnic minority parents have been found to behave less sensitive in parenting than majority parents. This difference seems to be largely caused by socioeconomic factors, (Mesman, van IJzendoorn & Bakermans-Kranenburg 2012) but this is not clear in all the studies (Yaman, Mesman, van IJzendoorn, Bakermans-Kranenburg & Linting 2010). Recent studies evaluated the way mothers from different cultures view the ideal sensitive mother, and showed that sensitivity is cross-cultural idealized, as the main behavioural markers of sensitivity are valued by mothers of different cultures. Mother’s sensitivity perceptions were related with socioeconomic factors (Emmen et al, 2012).

4.5. Parental psychiatric disorders

The presence of a psychiatric disorder in a parent is likely to interfere with normal caregiving and thus influence the development of attachment. In this section we highlight the processes responsible for this transgenerational transmission of risk. Mothers with mental illness are more exposed to multiple psychosocial risks, such as unplanned pregnancy, poor antenatal care, low socioeconomic status, less education and fewer social supports that will increase parenting difficulties (Miller, 1997; Miller & Finnerty, 1996). They described parenthood as rewarding, but identified sources of associated stress, like stigma, the management of their mental illness, custodial issues and day to day parenting demands (Nicholson, Sweeney & Geller, 1998).

As a result of their own faulty attachment, some parents with mental health problems may become dismissive, blocking off traumatic experiences in childhood and lacking capacity of self reflection Parents with eating disorders or obsessive symptoms may become preoccupied (Main, 1995).

Very important to attachment is the ability to focus on what matters to the child, specially when stressed, distinguishing between emotionally charged situations that concern attachment issues (and therefore call for comfort), and those that relate to opposition or annoyance and call for firm handling. When parents have impaired judgment context or difficulties in understanding the mental state of other persons, this ability is compromised (Hill, 2004). In women with severe psychiatric disorders, these limitations might top lead to a misattunement in infant attachment relationship (Lyons Ruth, Bronfman & Parsons, 1999a). The relation outside the symptomatic phase is crucial for attachment, influencing also the child capacity to adapt. It depends of her reflective capacity in relation to the attachment process (Hill, 2004)

Transgenerational transmission of psychopathology is an outcome of the interaction of genetic, neurobiological and social mechanisms of transmission (Caspi & Moffitt, 2006; Rutter, Moffitt &
Theoretical framework

Caspi, 2006). Characteristics of the parental disorder, the type of disorder, level of impairment, chronicity, comorbidity and the presence of a disorder in one or both parents, are considered as evidence-based risk factors of this transgenerational transmission (Beardslee et al, 2006; Hosman, van Doesum & van Santvoort, 2009). Protective factors have also been studied and identified, as less severe illness, older age of mothers, higher education, higher level of intelligence, a history of work experience and the presence of another adult at home (Goodman, 1987). One of the most important protective factors is secure attachment which may develop positively among children of a mentally ill parent, many times with a well functioning second parent or relative. Nevertheless infants of mentally ill women are more likely to adapt to the separation of their parents (Oates, 1997). The key to a healthy development is not diagnosis, but the quality of parenting practices (Goodman & Brumley, 1990).

Apart from the type of risk and protective factors, also their number has a significant impact. As we have mentioned before, Rutter & Quinton (1984) studied the population of children from the Isle of Wright and later from the inner city of London. They found that in most cases the main risk did not stem from the psychiatric illness itself. Rather it derived from the associated psychosocial disturbance in the family. Children with a single risk factor were no more likely to present with a psychiatric disorder than were children with no risk factors, and also that maternal psychiatric disorder did not add significant risk to the children in the absence of other factors. The extent to which children were exposed to and involved in their parents’ abnormal behaviour was relevant, but in this connection parental hostility, irritability, aggression or violence were more important than affective symptoms or psychotic manifestations. However as the number of concurrent risk factors increased, so did the risk factors for childhood psychopathology. That is the more the risk factors, the much greater the risk.

The Rochester Longitudinal study (Sameroff et al, 1998), also proved that the presence of a single risk factor was not associated with major developmental problems in children, but as the number of risk factors increased, parental competence decreased.

4.5.1. Parental schizophrenia

The typical symptomatology of a particular disease can affect parenthood. For example, acute factors specific to schizophrenia, such as disorganized speech or behaviour, delusions and hallucinations, may also mediate parenting difficulties (Golberg et al, 1998). But even in the absence of acute symptoms of psychosis, there are severe impairments in interpersonal and social functioning among those suffering from schizophrenia. Neurocognitive deficits, affecting attention, working memory and executive functioning, have a higher impact than positive symptomatology on the person’s ability to live independently (Golberg & Gold, 1995). Chronic negative symptoms of schizophrenia, such as affective blunting, may have an even greater effect on the quality of mother-infant interaction than positive symptoms (Cutting, 1995).
Mothers with schizophrenia are more remote, silent, verbal and behaviourally intrusive, self absorbed, flaccid, insensitive and unresponsive than mothers with an affective disorder. They are less demanding on their more avoidant infants, turning the interaction less mutually satisfying, less excited and more serious. Engagement becomes reduced. These mothers present more detachment and insensitivity, though many factors, including pharmacological treatment (Riordan, Appleby & Faragher, 1999). In another study, mothers with schizophrenia also demonstrated less positive affect to their children, were less responsive, with fewer verbal and non verbal interactions (Grunenbaum, et al, 1975; Kumar & Brockington, 1988).

Schizophrenic mothers, experience more obstetric complications (Sacker, Done & Crow, 1996), than women without mental illness, what seems to be related with genetic factors and behaviour during pregnancy. They have higher rates of substance abuse and poverty and are more likely to be victims of violence during pregnancy (Miller & Finnerty, 1996; Rudolph, Larson & Sweeney, 1990). They are less likely to receive prenatal care (Miller & Finnerty 1996), and have a high rate of custody loss (Coverdale & Aruffo 1989).

At least one in four women with schizophrenia becomes acutely psychotic within six months postpartum (Grunenbaum et al, 1975; Miller, 1997). Nevertheless, other authors report that women with pre-existent schizophrenia do not show a significative increase in risk of relapse, immediately after partum (Mc Neil, 1986; Davies, Mclovor & Kumar, 1995), though women with an affective component are at higher risk of relapse (Davies, Mclovor & Kumar, 1995). Women with a history of bipolar disorder or puerperal psychosis are at a particularly high risk in postpartum period (Kendell, Chalmers & Platz, 1987; Marks et al, 1992).

Mothers with schizophrenia are often considered to be unable to care for their children – rates of babies in care have been reported in up to 50% of women with schizophrenia compared with 10% in women with bipolar disorder admitted to a psychiatric mother baby unit in the UK (Kumar, Marks et al, 1995). Social support to mentally ill parent has shown to protect children from disturbance (Rutter & Quinton, 1984) but other authors have suggested that the most important single predictor of parenting outcome is a diagnosis of schizophrenia (Hipwell & Kumar, 1996).

4.5.2. Parental depression

Women of childbearing age are particularly at risk of depression (Kessler et al, 1994). The prevalence of clinical depression in the postpartum period is around 8-15 % with values varying between 12-15% in United Kingdom (Cox, Connor, & Kendell, 1982), of 13,1 % in Portugal (Augusto, et al., 1996) or 8-12 % in United States of America (O’Hara, et al, 1990). Many studies described the adverse effects of maternal depression, on the capacity of interaction with the newborn baby and indirectly on his subsequent development. The link between depressed mother and negative development can be explained in part by an
insecure mother-infant attachment (Cichetti, Rogosh & Toth, 1998). Children of depressed mothers have a higher risk for insecure attachment (Field, 1989; Radke-Yarrow et al, 1985; Spieker & Booth, 1988), but the evidence for an increase in a particular type of insecurity is inconsistent.

Children of mothers with unipolar depression had a higher rate (47% vs. 29 %) of insecure attachment than children of normal mothers, but this difference is increased in children of mothers with bipolar depression, in which the risk of insecure attachment is twice higher than in the children of healthy mothers. This greater vulnerability in bipolar mothers is consistent with a strong genetic component, as well as with environmental influences due to contrastive extremes and alternations of behaviour. Also other authors have suggested parental depression, in particular bipolar depression (Teti et al, 1995) as one of the precursors of disorganized attachment. Babies from mothers with a diagnosis of minor depression did not differ in frequency of secure attachments (three-fourths of the pairs were securely attached), from babies of nondepressed mothers (Radke-Yarrow et al, 1985).

Several studies offer insight in the mediating processes between maternal depression and insecure attachment in the child. Depressed mothers tend to express fewer emotions and show a sadder affect to their babies, compared with nondepressed mothers, as a result the children can perceive the caregiver as being inaccessible or unresponsive (Cummings & Cichetti, 1990; Cummings and Davies, 1996). In addition, depressed mothers can be more intrusive, less involved, less responsive, and less sensitive to the infant's signals, like a reduced ability to discriminate between small differences in cries (Donovan, Leavitt & Walsh, 1998). They speak less to their children, and usually talk in a quiet voice. They show more hostility such as anger, criticism, and irritability toward the baby (Cohn et al, 1990; Donovan, Leavitt, & Walsh, 1998; Downey & Coyne, 1990; Goodman et al, 1994; Radke Yarrow et al, 1992). They have difficulties in solving conflicts, and alternate between punitive discipline and lack of structure (Murray et al, 1996).

Field (2002), and Lyons Ruth and collaborators (2002), described two contrasting maternal depression interaction styles: withdrawn and intrusive style (Lyons-Ruth et al, 2002). Similarly, Gelfand and Teti (1990) described two contrasting manifestations of maternal depression: one subtype predominantly showing “characteristically apathetic, self absorbed, tearful and irresolute as a disciplinarian" and the other “anger, rejection and harsh, capricious discipline” These two patterns can be really different or alternate. Depressed parents can also have inconsistencies in parenting behaviours (Lyons Ruth et al, 2002). This ambivalence can led them to engage in contradictory caregiving strategies with their infants, who tend to develop insecure attachment styles. In contrast, other depressed mothers may relate with their children in a fearful and withdrawn manner without the intrusive, rejecting behaviour, and their infants
are more likely to develop disorganized secure attachment style, with signs of apprehension and dysphoria.

Two processes underline this disturbance: the child can imitate the depressive, irritable and hostile behaviour of the mother, or a vicious cycle of discord establishes in the relation. Not responsive, the child has a tendency to answer to her mother (not emotional available) in a disorganized and evitant way, not expressing positive affection what has a negative effect on mothers’ behaviour (Field, 1995).

Early mother-child interaction is the most crucial mechanism in explaining the effect of maternal depression on future child outcomes (Thronick & Weinberg, 1997; Field, 1995). Insecure attachment has been associated with socioemotional and behavioural problems in childhood and adolescence (Carlson & Stroufe, 1995). As examples, infants of depressed mothers shortly after birth show physiologic, behaviour and biochemical deregulation. At 3 months of age, children exhibit little positive and much negative affection, which gives them a depressed appearance (Tronick & Weinberg, 1997), and their interaction reflects a depressed mood style, not only with their mothers but also with others (Field, 1992). The daughters (not sons) of depressed mothers have more organic and behaviour problems little time after the birth (Field, 1998). During the first year of life, many of them have heightened levels of distress, negativity and avoidance of the mother (Gelfand & Teti, 1990; Murray & Cooper, 1996). One and two years old children have impaired socioemotional and cognitive development (Murray & Cooper, 1996). They are more likely to be less sociable and more fearful of strangers, may have lower frustration tolerance, tend to have more behavioural problems such as sleeping and eating problems, temper tantrus, separation difficulties and are more often insecurely attached (Cichetti, Rogosh & Taoth, 1998). They also tend to generalize this type of relation with other adults. At two years old they are more likely to show a delay in expressive language development as compared with children of nondepressed mothers (Cox, et al, 1987). Five years old children have a development delay related with the impaired capacity of regulating emotions and behaviours, and of establishing a hold and healthy attachment (Goodman & Gottib, 1999). EasterBrooks et al, concluded that maternal depressive symptoms in infancy were associated with maternal sensitivity and structuring at the age of seven (EasterBrooks et al 2000). At eleven years old, children whose mothers were depressed when they were aged three months, showed lower level of intelligence and poorer school performance (Hay, et al, 2001). Infants of depressed mothers, are less efficient in interpersonal relations and in his efforts to adapt to new tasks (Carlson & Stroufe, 1995), are less confident, more dependent and have more difficulties in making friends (Elicker, England & Stroufe, 1992). Longitudinal studies showed that, children of depressed parents have an increase risk of developing a major depressive episode in childhood and adolescence (Weissman, et al, 1997). The risk for anxiety disorders, major depression, and substance dependence globally,
was approximately three times as high in the offspring of depressed parents compared to the offspring of nondepressed parents. They also had higher rates of medical problems in adult age and showed higher social impairment (Weissman, et al, 2006).

**Biologic mechanisms involved in the impact of parental depression**

Different authors emphasized biological systems related to emotional expression and regulation, including stress-related neuroendocrinology (stress hormones elevated), autonomic activity (lower vagal tone) and cortical activation (relative right frontal EEG activation) (Field, 2002). Infants, whose mothers experience postpartum depression that interferes with their caregiving, may experience alterations in their neuroendocrine system, specifically HPA axis functioning (Lyons Ruth, 2002) and in frontal lobes development (Ashman & Dawson, 2002). These abnormalities can reflect genetic influences and exposure to atypical neuroendocrine patterns during fetal development (Field, 2002). Early exposure is probably a necessary aspect of this mechanism, but the fact that this first exposure, is prenatal or postnatal, might set children in different developmental pathways.

Depressed mothers inadequate parenting may exacerbate the infant’s biologic vulnerability. These vulnerable infants could be less responsible, expressive and attentive. Depressed mothers may be particularly challenged by the difficulties these babies bring to the mother-infant interaction.

These children have reduced left frontal brain activity, which is suggested to lower the level of affection toward the mother and higher levels of negative affect hostility and aggression, and increased autonomic activity, especially during social interactions. Infants of depressed mothers may also lack appropriate parent support to develop adaptation strategies to cope with distress (Ashman & Dawson, 2002).

The effect of depression seems to start during the prenatal period. Soon after birth these infants showed lower activity levels, less responsivity to social stimulation, indeterminate sleep, relative right frontal electroencephalography activation, and elevated stress hormones (norepinephrine and cortisol) patterns that were generally similar to those noted in their depressed mothers. This pattern, of behaviour, physiologic, biochemical deregulation, persists across infancy and into preschool. These infants had an even greater need for external regulation, because they were deregulated as early as the neonatal period, and they were disadvantage by their depressed mothers being emotionally unavailable, and therefore unable to provide adequate stimulation and arousal modulation. Whether these mothers have a withdrawn (understimulation) or intrusive (overstimulating) interaction style, their stimulation will be inappropriate. In turn, the infants can develop withdrawn behaviour (flat affect and low activity levels) or hyperactive (irritable affect and high activity level) that served as barrier to
inappropriate stimulation of their mothers. This behaviour may persist as a pattern of internalising or externalizing behaviour (Field, 2002).

Depressed pregnant women had more troubled sleep during the second and third trimesters, and higher levels of norepinephrine and cortisol. The newborns of depressed mothers also had more sleep disturbances including less time in deep sleep and more time in interminate (disorganized) sleep, and were also more active and cried/fussed more (Field et al, 2007).

**Determinants of parental depression**

Risk factors for parental depression include a past history of depression, low social support, a poor marital relationship and recent life-events (Beck, 1996, O’Hara & Swain, 1996; Wilson et al, 1996). Parents could be exposed to such risk factors at different periods of the child’s life, even during the prenatal period or earlier.

Multiple social factors and life-events can be associated with maternal depression and with child development troubles like, unemployment, health problems, problems in couple relationship, socioeconomical problems (lack of house, poverty) monoparental families, history of child abuse, abuse of substances, death in the family. In the families in which one of the parents is depressed these factors are more frequent than in general (Downey & Coyne, 1990; Nielsen et al, 2000).

Social factors also include poor perceived parental care in childhood, unplanned pregnancy, partner’s depression and having two or more children (Areias et al, 1996; Augusto et al, 1996; Gotlib et al, 1991; Warner et al, 1996).

Two metanalysis have identified significant risk factors for postpartum depression. In the first one (Beck, 2001), ten risk factors were moderately related to postpartum depression: prenatal depression, low self-esteem, difficulties with child care, prenatal anxiety, a high stress level, a low level of social support, poor marital relationship, a history of depression, difficult infant temperament, and maternity blues. Three other factors had a small but significant relationship to postpartum depression: single marital status, low socioeconomic status and an unplanned or unwanted pregnancy. Another metanalysis (Robertson et al, 2004), found that the strongest risk factors were prenatal depression, prenatal anxiety, stressful life events (usually within the previous year), a lack of social support, and a history of depression before the pregnancy occurred. Moderate risk factors included a poor marital relationship and neuroticism. Obstetric factors (including complications due to pregnancy or delivery) and low socioeconomic status were characterized as small risk factors.

Pregnant women, who have lost a baby before, showed more frequently an unresolved/disorganized state of mind, according with AAI. In this population, social and attachment factors did not predict infant disorganized attachment, as mothers of no
disorganized infants, showed significantly higher levels of depression and of intrusive thoughts on the posttraumatic stress disorder, and showed higher levels of intrusive thoughts when infants were one year old (Hughes, 2006).

4.5.3. Antenatal anxiety

High levels of anxiety during pregnancy, but not relevant during delivery are associated with parental stress during the first weeks after birth (Younger, 1991); anxiety during pregnancy is related with higher rates of postpartum depression (Bridge et al, 1985; Pitt, 1978) and with more emotional and behavioural difficulties (Glover & Connor, 2002; Martin et al, 1999). During pregnancy women get more concerns as delivery become closer in time. Women are special worried with the condition of their unborn child (especially malformation diagnosis and possibility of abortion) and socioeconomical issues (Conde & Figueiredo 2007; Pacheco, et al; Costa & Pais, 2005). While mothers are also concerned with their competencies to deal with delivery, taking care of the baby and with their physical and emotional preparation to the arrival of a new family member, fathers are more centred in their concerns about their new role as fathers after birth and how to provide support to their wives during birth (Matulaite- Horwood & Bieliauskaite, 2005).

Anxiety is very common in normal pregnancy. Nevertheless some women exhibit higher levels of anxiety and stress, with clear adverse repercussions in their well-being and health, and in baby’s health and development (Conde & Figueiredo, 2007).

Elevated levels of stress during pregnancy have been associated with antenatal complications, and negative birth outcomes, such as preterm labour, low birth weight, and APGAR scores, (Daole et al, 2003; Paarberg et al, 1995). Elevated levels of stress hormones, such as cortisol have been suggested as the biological mechanisms leading to health complications in pregnant women (Austin & Leader, 2000). A more recent meta-analysis from Littleton and collaborators (Littleton et al, (2007), reported that there was not a significant association between anxiety and perinatal outcomes, though only small statistically significant relation was present for birth weight and five minutes APGAR.

There is a strong association between antenatal anxiety and child neurodevelopment. Van der Bergh (1990), studied fetus of anxious mothers by echography and identified that infants of anxious mothers tend to be more active, than infants of nonanxious mothers. Van der Bergh and Marcoen (2004) found that maternal antenatal anxiety explained 22% of the variance in Attention deficit and hyperactivity disorder symptoms, and of 9% of the anxious symptoms at eight and nine years old of children, after controlling for postpartum anxiety. Another study found that anxiety in late pregnancy, was associated with doubling the risk of child ADHD, anxiety or depression, or conduct disorder at 4 and 7 years old (O’ Connor et al, 2002). Based on his meta-analysis Littleton and collaborators (Littleton et al 2007) reported a number of
significant correlates of antenatal anxious symptoms. These include significant inverse associations with age, educational level, socioeconomic status, and social support; significant positive correlations with gestational age, parity, negative life-events and perceived stress. Antenatal anxiety is strongly related with both antenatal depression and postpartum depression (Robertson et al, 2004; Sutter-Dallay et al, 2004).

However, another study did not support the notion that maternal anxiety, depression or nonspecific stress during pregnancy constitutes a significant threat to early child development or behavioural regulation. In contrast, they found modest, although consistent, support that these aspects of maternal functioning are associated with more optimal early child development, like a better motor and mental development. Mild to moderate levels of psychological distress, so within normal limits, may enhance fetal maturation in healthy populations (di Pietro et al, 2006). So, we may conclude that the impact of antenatal anxiety, depression and stress is probably dependent on their level of intensity.

Parent’s perception of their own maternal care is also relevant as parents who perceived their own mothers as less caring, showed more dysphoria at eight months gestation, and at two weeks and three months postpartum. Both mothers and fathers who perceived their mothers as affectionless and/or controlling were more likely to experience fluctuations in mood in peripartum period. These findings suggest that early parenting experiences set the threshold for how vulnerable parents behave in the peripartum period to the depressive costs of engaging with a new infant (Mayes & Leckman, 2007).

4.5.4. Maternal addictive behaviours

Prenatal exposure to tobacco, alcohol and illegal drugs are established risks for poor fetal growth and to a less extent for preterm birth, attention-deficit/hyperactivity disorder and neurodevelopment impairment, such as or poor cognitive and language development (Kramer, 1987).

Addicted women’s parenting, is characterized by a wide range of deficits, including neglect, physical and emotional abuse, excessive control and punishment, inconsistent discipline and lack of emotional involvement (Mayes, 1995). We can differentiate between two kinds of effects:

- **Direct effects** - Parents who are identified as abusing or neglecting their children often have concurrent substance abuse problems (Murphy et al, 1991; Hampton, Senatore & Gullota, 1998). Parenting styles among opiate and cocaine addicted mothers often present parallel dimensions of abuse and neglect, vacillating between authoritarian over-control and excessive permissiveness. The authoritarian style (Baumrind, 1971), has been characterized by overinvolvement, harsh verbal criticism, extensive punishment, controlling approaches to
Theoretical framework

discipline and exclusion of parenting support from other adults (Mayes, 1995; Lutar & Suchman, 1999). The neglectful style has been characterized by withdrawal, ambivalence, limited involvement and engagement, insecure attachment and diminished responsiveness (Mayes, 1995; Harden, 1998). Neglect has also recently emerged as the most prominent form of child maltreatment among mothers abusing illicit drugs (Besinger et al, 1999). Opiate addicted mothers, in particular, have been described as less emotionally involved (Hans, 1992) and responsive with infants (Bernstein et al, 1984) and more provocative and threatening with school-aged children (Bauman & Dougherty, 1983). Pregnant woman who abused cocaine, are less reflective than their disadvantaged but cocaine free counterparts. Maternal reflexive function is also positively correlated with child attention, social skills and adaptability, and negatively correlated with parental distress, parent child dysfunction and child withdrawal. RF appears to mediate the effects of maternal drug use on child social skills, parent distress, and parent-child dysfunction (Truman, Levy & Mayes, 2000).

- Conditional effects - Being single and having a large family, conferred differential vulnerability for addicted versus nonaddicted mothers. Specifically, being single conferred greater vulnerability for addicted mothers’ involvement, whereas cohabitation and smaller family size conferred greater risk for restricted autonomy. For addicted mothers cohabitation with partners and having fewer children may lead to more protective and enmeshed parenting styles.

Studying prenatally drug-exposed toddlers and their caregivers, Swanson et al (2000), observed that the caregivers of toddlers with avoidant or disorganized attachments were found to be more intrusive than caregivers of toddlers with secure or resistant attachments.

Drug abusing mothers show a lower general emotional availability, at the second and fifth month of the babies. They are also less sensitive in perceiving and responding to their babies’ interactive signals (Fraser et al, 2010) and also in showing positive emotional expressiveness (Burns, Chetnik, Burns & Clarke 1991). The difficulties in guiding the child and structuring are common (Blackwell, Lockman & Kaiser, 1999). The most common characteristics of drug abusing mothers are high intrusiveness and hostility (Johnson et al 2002; Salo et al, 2010). They are also considered the ones that are more detrimental for child development (Lyons Ruth et al, 1987). Children of drug abusing mothers have cumulative risk factors, like the exposure in uterus of the drug mothers consume, and the deficits in mother-infant interaction. Drug abusers frequently have negative representations or idealizations of mother-baby interaction, what can create them higher difficulties when confronting to reality. Both negative and idealized representations predict difficulties in interaction (Flykt et al, 2012).
4.6. Abuse & Neglect

Unfortunately, early in childhood and along their life many people have been exposed to abuse and neglect. These circumstances may influence the quality of attachment they establish later with their infants. The prevalence of any type of abuse (physical or emotional) is very high in many countries, with values like 73% in Portugal (Figueiredo et al, 2004), 92% in USA (Milner, Robertson & Rogers, 1990), and of 94% in Spain (de Paúl, Milner & Múgica, 1995).

In Portugal as in all other countries, physical abuse in general began before the age of 13 (but over half continued in adolescence). No significant gender differences were found in reporting physical abuse, although men were more likely to report early physical abuse with sequelae/injury than women (Figueiredo et al, 2004). In Portugal rates of sexual abuse are of 2.6%, lower than in USA (19.1%) and in Spain (12.2%) and there are no differences in the gender victim, contrasting with USA and Spain where women had higher rates. There is a high correlation between both physical and sexual abuse and parent neglect (Bifulco, Brown & Harris, 1994). In Portugal, violence against women has a prevalence from 6.7% to 13, 7%, (Gonçalves & Machado, 2002) and the rate of physical marital violence is of 20.5% (Coelho, 2005), similar to values from 15% to 40% in other countries (Richardon et al, 2002; Ramsay et al, 2002).

Parents who grew up in households with punitive, rejecting abusive or neglectful caregiving are more likely to abuse or neglect their own children (Egeland, Jacobvitz & Sroufe, 1988; Quinton & Rutter, 1984; Rutter, 1989). Parents who have experienced child abuse are at elevated risk to abuse their own children (Youngblade & Belsky 1988). They are more likely to come from large families, with closely spaced children (Tygart,1991), where parents themselves are involved in substance abuse and criminal behaviour (Moffitt, 1993). However, probably most abused parents do not abuse their children (Kaufman & Zigler, 1987).

Parent’s psychological immaturity and mental health problems can reduce their ability to care for their infants (Newberger & White, 1990; Sanner, 1983). Unemployment (Gil, 1970), poor housing and household conditions (Gil, 1970), marital discord (Belsky, 1981) and isolation from supportive family members and friends (Garbarino, 1981) are all associated with higher rates of abuse and neglect, perhaps because they create stressful conditions in the household that interfere with parents ability to care their children (Bakan,1971). Reorganized families, monoparental families, dysfunction family and husband alcoholism, were associated with a higher risk of violence (Bakermans – Kranenburg, van IJzendoorn & Juffer, 2005).

Maltreating mothers have experienced more perinatal difficulties than nonabusing mothers (Murphy, Orkow & Nicola, 1985) beginning before birth, such as ambivalence about pregnancy, medical problems, including a difficult pregnancy or delivery, or a previous abortion or stillborn child. These difficulties are even more prevalent in teenage mothers. A young age implicates a high potency risk, because of physical, psychological and social
immaturity and probably social related factors (Conelly & Strauss, 1992). Young mothers are more often, exposed to a variety of stressors such as a single parenthood, or marital violence and poverty. Other factors associated with the probability of abusive behaviour include inadequate knowledge of normal child development, inadequate education, and insufficient social support or not being able to mobilize it, and having a high chance of an early repeated pregnancy (Connelly & Strauss, 1992).

**Abuse and infant attachment**

There are long-lasting effects of early maltreatment on internal working models of children. Infants of mothers who experienced childhood violence or abuse were not more likely to display insecure attachment strategies than infants of mothers who had not experienced trauma. Insecure babies of violence exposed mothers displayed predominantly disorganized strategies, whereas insecure infants of mothers with benign childhoods or neglect displayed predominantly avoidant strategies. Carlson and collaborators (Carlson et al 1989) observed that over 80% of maltreated infants, compared to 29% of a comparison group, could be classified as having disorganized/disoriented attachment. Of children with disorganised attachments at 12 months 60% maintain disorganisation at 24 months of age. Lynch and Ciccetti (1991) reported that about 30 % of 6 to 12 years old children in a maltreatment sample displayed “confused” patterns of relatedness with their mothers. These children reported feeling emotionally positive and secure, but also felt that they needed more closeness that they received. At sixth grade maltreated children revealed more negative expectations for relationship with their parents than their non-maltreated peers (Mc Crone, et al, 1994). In disorganized attachment, the common dominator is the absence or breakdown of an organized strategy to deal with stresses. The child’s dilemma on dealing with stress and anxiety is provoked by the fact that his parent is at the same time the source of fear and also the only possible protective figure in which to turn. In face of this paradoxical situation, the child became becomes frightened, without any solution, and its organized attachment strategy falls apart.

**Consequences of disorganized attachment**

Disorganized attachment in infancy is predictive of problematic stress management (Spangler & Grossmann, 1993; Willemsen-Swinkels et al 2000) and elevated risk of externalizing behaviour problems (Lyons-Ruth, Easterbrooks & Cibelli, 1997), lower emotional health at school age, and dissociation in adolescence (Carlson, 1998). A comprehensive meta-analysis by van IJzendoorn, Schuengel & Bakermans – Kranenburg (1999), documented significant effects of disorganized attachment on infants physical stress
reactions, and on externalizing problems in school age. It is also associated with later psychopathology (Lyons Ruth & Jacobvitz, 1999).

**Mediator mechanisms**

Main and Hesse’s (1990) hypothesis of a link between frightening or frightened parental behaviour and disorganized attachment, has been tested and demonstrated in four studies (Schuengel, Bakermans-Kranenburg & van IJzendoorn, 1999). Secure mental representations seems to have a protector role, as unresolved but secure mothers showed significantly less frightening behaviour towards their babies, than did unresolved insecure mothers (Schuengel, Bakermans-Kranenburg & van IJzendoorn, 1999). Parental insensitivity is supposed to be related with organized insecurity through avoidance and ambivalence (de Wolf & van Ijzendoorn, 1997) but not with disorganized attachment (Main & Hesse, 1990). However, in a metanalysis a small but significant association between parental (in) sensitivity and disorganization was found (van IJzendoorn, Schuengel & Bakermans – Kranenburg, 1999). Lyons-Ruth and Jacobvitz (1999) hypothesized that parental insensitivity as assessed with the Ainsworth scale may not be sufficiently differentiated and specific to predict disorganization.

Lyons Ruth and Jacobvitz (1999) described two relational patterns in which the parents either coercively oppose and counter the initiatives of the child by negative and intrusive behaviour, or withdraws from the interaction by being (extremely) unresponsive to the needs of the child. Solomon and George (1999) hypothesized that a profound lack of response or a failure to terminate the child’s attachment system, may lead to infant disorganization.

**Intergenerational transmission mechanisms**

Intergenerational continuity of child maltreatment can be explained in part by the presence of poor parenting styles, in combination with three other significant risk factors namely parenting under 21 years, history of mental illness or depression and residing with a violent adult (Dixon, Browne & Hamilton-Giachritis, 2005).

A history of physical abuse in the mother is associated with increased hostile-intrusive behaviour toward her infant, increased infant negative affection and a decreased tendency to report trauma related symptoms (Lyons Ruth & Block, 1996). A history of sexual abuse was associated with decreased involvement with the infant, more restricted maternal affect, and more active reporting of trauma-related symptoms.

Children who have been abused develop negative attribution biases that make them more likely to interpret ambiguous behaviours on the part of others as threatening (Dodges, Bates & Petit, 1990), and to have internal representations of interpersonal relationships characterized
by deregulated aggression and violence (Buchsbaum, Toth, Clyman et al, 1992), reflecting an adaptive neurological response to a threatening world (Teicher, 2000).

Maternal empathy requires flexible access to one’s feelings of vulnerability and distress in order to adequate response to similar infant affective communications. For severely traumatized mothers, this may be an impossible demand (Fraiber, Adelson & Shapiro 1975). Traumatic experience in childhood involves breaches of trust and protection in the attachment relationship. Affects and behaviours of the child may be particularly threatening to the mother’s defences against experiencing her own vulnerability and distress. If mental strategies to maintain segregation of dissociated representations associated with overwhelming fear and distress are needed to protect mother’s ability to function, empathic emotional contact with the infant may need to be defended against to keep the mother from becoming flooded with unintegrated memories of her own earlier painful vulnerability and lack of protection (Lyons-Ruth & Block, 1996). Unresponsive withdrawal and unresponsive hostile intrusiveness allows the mother’s not to have a responsive emotional contact with the infant for her own self protection (avoiding her own unintegrated memories). Thus mothers who have experienced child abuse or neglect, may be less likely to display frightened behaviour directly and more likely to display personality adaptations to fear like affective numbing or identification with the aggressor. Experienced fear and helplessness and subsequent disorganization of infant attachment strategies in this view may result from profound disruption in the affective discourse between mother and infant, a disruption threat we suggest be tied to parental attempts to defend against unintegrated fear related to childhood violence (Lyons Ruth & Block, 1996).

Also sexual abuse has long lasting, negative effects, like impairments in emotional, cognitive, behavioural and social functioning. These includes nervousness and anxiety, guilt and shame, low self-esteem, fearfulness, depression, cognitive distortion including dissociation, nightmares and problems in regulating affective arousal (Ussher & Dewberry, 1995). Exposure to chronic trauma challenges the child’s capacity to establish a cohesive personality, interfering with processes of integration between memories, emotional stases, and physical experiences (Herman, 1992).

Mothers who were victim of sexual abuse in children might experience difficulties in their caregiving role; they tend to be more self-focused and less child-focused compared to nonabused mothers (Burkett, 1991); they also tended to show derogation, blaming and less acceptance and understanding, while talking with their children (Burkett, 1991); they have unreasonable and rigid expectations of their children and tend to report dissatisfaction in their maternal role (Banyard, 1997; Zuravin & Fontanella, 1999).

Also genetic factors seem to be implicated (Rutter et al, 1998a). Van IJzendoorn & Bakermans-Kranenburg (2006) have proved that children are differently susceptible to unresolved loss or trauma dependent on the presence of the 7 repeat DRD4 allele. They found that DRD4 7 repeat elevates the risk for infants becoming disorganized, but only when mothers are
struggling with unresolved trauma or loss. Only in the presence of a distal environmental risk factor, namely maternal unresolved loss or trauma, infants with a long DRD4 variant appear to be more liable to develop attachment disorganization. The presence of a proximal risk factor, maternal frightening behaviour did not increase the odds of infant disorganization for infants with the long variant of DRD4. The model shows how genetic vulnerabilities may moderate the association between unresolved trauma and infant disorganization. The combination of these two factors is an example of the cumulative risk model of Rutter (2006). Bakermans-Kranenburg & van IJzendoorn (2006) demonstrated that the interplay between DRD4 and observed parental insensitivity was associated with externalizing problem behaviours. There’s also a relation between disorganized attachment and disrupted communication between mothers and infants, but only for the majority of infants who carried the short form of DRD4 allele, suggesting that these infants were less sensitive to regulation by the caregiving relationship (Gervai et al, 2007).

Genetic variation seems to modulate sensitivity to care. What these findings imply is that secure attachment is aided not only by the sensitivity to the infant’s cues, but also by the infant’s sensitivity to the parent’s sensitivity. It may hypothesized that functional variations in the DRD4 gene, expressed preferentially in brain regions of the reward circuit (prefrontal/cingulated cortex, nucleus accumbens and ventral tegmental area), modulate sensitivity to maternal stimuli resulting in differential sensitivity to caregiving behaviour. This link points to the DRD4 polymorphism as a potentially important genetic risk factor underlying these behavioural outcomes when combined with adverse care. Some multifactor disorders, instead of resulting from many genes of small effect, may result from variations in fewer genes whose effects are conditional on exposure to environmental risk (Caspi et al, 2003)

Gauthier (1996), made a review about protective factors, and demonstrated that a certain number of mothers, 28% to Fonagy (1994) and 42% to Lyons Ruth et al (1990), submitted to abuse and neglect in their childhood, presented a remarkable resilience and were able to transmit a secure attachment, to their children. This discontinuity in the attachment pattern raises the question of how is it possible to change (George & Solomon, 1996). To Fonagy (1994) these mothers developed their RF, about their own, making them able to consider their infant distinct from themselves, with their own emotions, desires and intentions. The birth of a new child seems to be a crucial moment, as women have a greater sensitivity and easy access to unconscious field. Bydlowsky (1991) talks about ‘psychique transparency’, Raphael-Leff (1993) uses the expression ‘unconscious permeability’ and Molènat (1992) talks about ‘fluidity’ allowing articulating the most profound limits of affective life. The availability of a supportive adult during childhood, a currently supportive partner, a good health of the baby, a rich social network, available day care, and the firm decision not to
transmit the abuse of the child, can act like buffers, preventing transmission of child abuse (Hunter & Kilstrom, 1979).

Through his temperament or favourable reactions, through the pleasure that he felt, the infant has a relevant role in helping her mother to recognize her role (Solomon & George, 1996), what could help her to repair her past. But the opposite can also happen and a more difficult child can provoke on the mother a feeling of incompetence (Belsky & Rovine, 1990).

In the context of intimate partner violence, personality traits of the mother have been found to have a significant effect on predicting patterns of parenting, influencing maternal representations, as they can buffer the events of violence or to magnify negative effects on maternal representations (Lannert, Levendosky & Bogat, 2013). Results suggest that personality is associated with the initial development of maternal representations, and support the argument that maternal personality interacts with the caregiving system and is an important intraindividual factor to consider in studies of early caregiving.

Finally, combinations of risk factors might be of special importance. For instance, recent studies have stressed the role of specific pairs of risk factors associated with child abuse namely: child abuse and peer violence (Grych et al. 2000), and child abuse and poverty seem to influence each other in the emergence of child abuse (Horowitz & Wolock, 1985).

4.7. Conclusions

We can conclude that THE quality of child care is multiply determined, and that in terms of developmental psychopathology, we have to consider the existence of risk and protective factors (Sroufe & Rutter, 1984). According to the cumulative risk model, what pose threats to the integrity of the developing parent-child relationship is the existence of multiple, rather than single risks factors (Belsky, 1990). Risks can be balanced by strengths, and risks of problematic developmental outcomes (including attachment insecurity) are more likely to be realized as accumulating risk factors, not balanced by supports or compensatory factors.

Thus not only do mediating processes need to be central to our understanding of the origins of individual differences in attachment styles (distal factors → parent-child interaction → attachment security), but so too moderator ones, as the impact of one source of influence is highly likely to be contingent to another.

In this study we have offered evidence suggesting a range of determinants of the mother-infant relationship, including age, marital relationship, social disadvantages, migration, parental psychiatric disorders and the situations of abuse or neglect.

Mothers appear to play a more important role than the child in shaping the quality of infant-mother attachment. The mother’s more mature capacities allow her to be guided by infant
needs, while infants are not capable of comparable adaptation (van IJzendoorn et al, 1992). Pregnancy offers the earliest opportunity to strengthen these factors. Physicians should be aware of potentially vulnerable groups, as precocious detection seems to be relevant during pregnancy, especially in high risk situations related with future difficulties in mother-baby interaction. Also relevant is the fact that a subgroup of psychological vulnerable childbearing women are at particular risk for poor access to health care and adverse infant outcome (Murray et al, 2003). Primary Health Care must develop mechanisms to detect these women, and organize support for them, namely in what concerns adolescent, single mothers, women in social disadvantage situation, migrants, women with psychiatric disorders and those who are abused or neglected.

Screening provides an opportunity to access a larger number of women and facilitate pathway to best practice care, developing strategies in order to minimize risk or developing protective factors. So, we can conclude that it is of extreme relevance the identification of an instrument that could help Primary Health Care professionals to early detect risk.
Theoretical framework
PART I
THEORETICAL FRAMEWORK

CHAPTER 5
THE ALPHA
ANTENATAL PSYCHOSOCIAL HEALTH ASSESSMENT
Theoretical framework
ANTENATAL PSYCHOSOCIAL HEALTH ASSESSMENT

As we have stressed in the previous chapter, the early detection in pregnancy of women in psychosocial risk, would allow the professionals in maternal health consultation in PHC to implement, as soon as possible, strategies to decrease risk factors and to strengthen protective factors.

The Antenatal Psychosocial Health Assessment (ALPHA) was developed by a multidisciplinary team of family physicians, obstetricians, psychiatrists, nurses, psychologists and midwives in Canada, as a way of obtaining psychosocial data on risk factors during pregnancy in a structured, logical and cost effective way (Reid, et al., 1998). The ALPHA group is integrated in the Department of Family & Community Medicine, from the Medicine Faculty, Toronto University. The authors identified a number of factors that according to the literature are associated with negative outcomes such as postpartum depression, child abuse, women abuse, couple dysfunction and physical illness. In the preceding chapter we have discussed these risk factors.

The ALPHA is an instrument that identifies the existence of psychosocial risk factors, grouped in family risk factors, maternal risk factors, risk related to substance abuse or family violence. For each of the 15 questions concerning the presence of a risk factor, the observer must code low if he thinks there is no risk at all, some if he admits the possibility of risk but needs to clarify it, and high if he thinks that a certain risk factor exists, and represents the implementation of an additional professional action. In each subgroup of risk factors it is possible to get a score that identifies the total risk level for that group: familiar (ALPHA F), maternal (ALPHA M), related to substance abuse (ALPHA SA) or the risk associated with family violence (ALPHA RV). The ALPHA has two versions, one is a self report fulfilled by the mother and the other filled in by a professional observer. At the end of the scale a list of optional resources in the community is added to identify what resources the pregnant women could use to deal with the identified problems. In their randomized study among general practitioners, obstetricians and midwives, Carroll and collaborators, demonstrated an increase of detected psychosocial risk factors by using the ALPHA, compared to standard care (OR 1.8 95% confidence interval) (Carroll et al. 2005). Primary care professionals using the ALPHA were also more likely to rate the level of their concerns about these risk factors as ‘high’ (OR 4.8, 95% CI 1.1 -20.2, p 0.03). They were especially better able to identify issues related to family violence. Authors conclude that it is a useful tool to identify those in need of additional support or intervention.

For research purpose, Carrol and collaborators advocate a dichotomy of the responses in 0 (low risk) and 1 (some or high risk). In her study she compared the detection scores using the subscales ALPHA, with detection scores in standard care, and the only dimension that proved differences in the detection capacity, was Family Violence. The use of ALPHA increased by
almost 5 times the detection of family violence risk, compared to the control condition (Carrol et al., 2005). Also Blackmore and colleagues (Blackmore et al., 2006) conducted a randomized controlled trial in PHC involving 227 pregnant women comparing the standard detection of risk factors with the systematic use of the ALPHA. The only subscale in which they found significant differences was also family violence (OR 2.7 95% CI 0.04 p 1.1-6.9). On the other dimensions of risk there were no statistically significant differences between both conditions. The authors recommend the use of the whole ALPHA to detect psycho-social risk, but not the use of subscales.

More recently, a review of the different instruments to detect psychosocial risk in pregnancy has been performed, highlighting some limitations of the studies that have been done with this instrument (Johnson et al. 2012). Taking as an example the study done by Blackmore 38% of probable cases of depression were detected amongst women using the ALPHA when compared with the use of EDPS, and family violence was the only category that showed a significantly Odds Ratio (OR 2.7, 95% CI 1.1-6.9). The family and maternal subscales didn’t show statistical differences.

They conclude that, considering the small sample size of the study and the unknown sensitivity, specificity, positive and negative predictive values, ALPHA is not recommended. A Cochrane review done by Austin (2008), alert to methodological questions of the studies done to prove the interest of ALPHA like the small size of the samples or the high number of dropouts. The present study aims to further inquire the reliability and validity of the ALPHA making use of a study among Portuguese mothers.

Notwithstanding these methodological concerns, ALPHA is commonly used in Ontario – Canada since 2000, as is a part of the Ontario Antenatal Record, and is endorsed by the Canadian Paediatric Association, Canadian Psychiatric Association, College of Family Physicians of Canada, Ontario Association of Midwives, Ontario Medical Association, Royal College of Physicians and Surgeons in Canada and Society of Obstetricians and Gynaecologists in Canada. The ALPHA Project has the financial support of Lawson Foundation, Ontario Medical Association, the PEI Reproductive Care Committee, Women’s Health Bureau, Ministry of Health, Ontario, Women’s Health Programme Toronto Hospital. It also got administrative support by The Family Health Care Research Unit from the Medicine Faculty of the Toronto University.

ALPHA has been tested in the Canadian context in PHC (Reid et al. 1998; Carroll et al. 2005) and has been gaining popularity for antenatal screening in this setting. ALPHA has undergone a large face and content validity by experts including family physicians, obstetricians and midwives (Reid et al. 1998), and proves to identify more psychosocial risk factors than routine assessment (Blackmore et al. 2006).
According to Kingston (2014), as no cut-off points or scoring algorithms have been developed, sensitivity and specificity data are not yet available. Risk categories have been used with the main objective of creating a care plan. This author is initiating a research that will clarify many of the questions that were raised by Austin. The research, which protocol has been published in 2 January 2014, has as a primary objective, “the determination of pregnant women’s and health care providers’ view of the feasibility and acceptability of mental health e-screening compared to paper-based screening”.

She also defined five secondary objectives, comparing “(1) the level of detection of prenatal depression and anxiety symptoms and psychosocial risk; (2) the level of disclosure of symptoms; (3) the factors associated with the acceptability, disability, and disclosure; (4) psychometric properties (sensitivity, specificity, positive and negative predictive values) of the e-version of ALPHA and EDPS when administered to medically low and high risk pregnant women, and (5) cost-effectiveness of screening.”

We hope that the present study can contribute to the comprehension of some issues related with ALPHA and we will take the results on this promising Canadian study into account.
Theoretical framework
PART I
THEORETICAL FRAMEWORK

CHAPTER 5
THE THEORETICAL MODEL
Theoretical framework
THEORETICAL MODEL

The Theoretical Model that we have constructed has been based on the outcomes of the extensive review of empirical literature on Mental Health, Mental Health Promotion, Maternal-Fetal Attachment and Attachment presented in chapters 1, 2 and 3 from part I. According to the same review we selected Sense of coherence, Maternal-Fetal Attachment and Emotional Availability to operationalize the previous concepts in the original research that will be presented in part II. The selected risk factors were identified according the literature that has been presented in chapter 4 and ALPHA (described at chapter 5) was the chosen instrument to detect risk. The Model is represented on figure 1.2.

1 The Model is based on the assumption that a pregnant woman has a number of social circumstances, socio-demographic conditions, mental health characteristics (depression, psychopathology and sense of coherence) and risk and protective factors (evaluated by ALPHA) that will influence the way she will develop the attachment to her baby to born. Next, it is assumed that maternal fetal attachment will influence mother-baby interaction after delivery.

2 Distinguishes a number of domains that interact and influence the different systems, namely - pregnant women, husbands, family and community systems, organized into risk and protective factors. It takes into account biological, social, psychological risk and protective factors. By identifying these factors (some of which are malleable) opens the door for windows for intervention.

3 Differentiates various routes of intergenerational transmission of risk, including genetic transmission, mother’s psychological organization (taking into account their previous experiences and background), experience of pregnancy, family and social processes, and also mother-baby interaction.

4 Although it only focuses on pregnancy and on the first months of life, the model presupposes the existence of developmental periods (maturational), particular sensitive periods, related with either a time period during pregnancy either with the baby’s age.

5 It takes into account the principles already described of equifinality and multifinality, and addresses a prevention perspective targeted at broad spectrum outcome and not at the development of a specific disease.
Theoretical framework

6. The Model emphasizes the need for an instrument for risk identification, and also for identifying protective factors in order to support the implementation of strategies that can minimize risk factors or strengthen protective factors. It will also serve as a basis for research, particularly in response to the two major research questions of this study.

7. This Model is on line with the Ecological Model of Belsky, putting together distal and proximal factors and framed in a Public Health context.

Fig 1.2 – The Theoretical Model
PART II
ORIGINAL RESEARCH
We will present now the Original Research that constitutes the present study. This second part is organized in the following chapters:

1. The Population of Amadora
2. Aims and Interest of the study, research questions and expectations
3. Methodology
4. Results
5. Discussion
6. Conclusions
PART II
ORIGINAL RESEARCH

CHAPTER 1
THE POPULATION OF AMADORA
1. THE POPULATION OF AMADORA

The Municipality of Amadora, located in the suburban area of Lisbon, has a clear identity which is based on its particular history and social, cultural and ethnic diversity.

It has an estimated population of 175,136 inhabitants (Instituto Nacional de Estatística – INE 2011) and a high population density (7363 inhabitants/Km2), clearly higher than the existing in the region of Lisbon (301 inhabitants/Km2). The number of inhabitants is stable in the last years, existing a progressive aging of the population.

As we can observe in Table II.1.1, there is a higher rate of non Portuguese inhabitants than in Portugal as a whole (13.85% vs. 5.77%), mostly from African, Portuguese speaking African countries, that were in the past Portuguese colonies, like Cabo Verde, Angola, Moçambique, Guiné, S. Tomé and also from Brasil (INE 2011). In this region there is a high prevalence of HIV Infection, according to the WHO criteria for generalized epidemic, a double typology of HPV, characteristic of respectively African and European women, and also examples of diseases that are rare in Europe, like malaria.

Table II.1.1 – Population of the Amadora Municipality – Nationality Rate (INE 2011)

<table>
<thead>
<tr>
<th>Nationality (%)</th>
<th>Amadora</th>
<th>Portugal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portuguese</td>
<td>86.15</td>
<td>94.23</td>
</tr>
<tr>
<td>European</td>
<td>1.18</td>
<td>1.27</td>
</tr>
<tr>
<td>African</td>
<td>6.29</td>
<td>0.95</td>
</tr>
<tr>
<td>American</td>
<td>2.35</td>
<td>1.07</td>
</tr>
<tr>
<td>Double Nationality (Portuguese and other)</td>
<td>3.06</td>
<td>1.93</td>
</tr>
<tr>
<td>Others</td>
<td>0.97</td>
<td>0.55</td>
</tr>
<tr>
<td>Immigrant with resident legal status %</td>
<td>12 (CMA)</td>
<td></td>
</tr>
</tbody>
</table>

The indicators related to high-risk maternity in Amadora are worrying. Compared with the Region of Lisbon, there is a higher birth rate in women younger than 20 years (6.4/4.0), higher rate of low weight on birth (9.4/8.4), higher child mortality (7.7/3.5) and higher neonatal mortality (4.9/2.5) (Administração Regional de Saúde de Lisboa e Vale do Tejo – ARSLVT, 2009-2011).

According to the local health indicators (Table II.1.2), there is a higher rate of one parent families than in the Great Region of Lisbon, and a higher rate of people receiving economic support for leaving in poverty (80,39/000 vs. 48,45/000). The rate of unemployment is also higher than in the Lisbon Region (14,96/13,19). These differences are even more outspoken when compared to figures for Portugal as a whole.
Table II.1.2 – Amadora local health indicators

<table>
<thead>
<tr>
<th></th>
<th>Amadora</th>
<th>ARSLVT (Region of Lisbon)</th>
<th>Portugal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population density Inhabitants/Km2 **</td>
<td>7363</td>
<td>301</td>
<td>113</td>
</tr>
<tr>
<td>Youth dependency **</td>
<td>22</td>
<td>29</td>
<td>22</td>
</tr>
<tr>
<td>Old people dependency **</td>
<td>28</td>
<td>23</td>
<td>30</td>
</tr>
<tr>
<td>Birth rate (%)*</td>
<td>11,7</td>
<td>11,5</td>
<td>9,5</td>
</tr>
<tr>
<td>Birth rate in women &lt;20 years (%) ***</td>
<td>6,4</td>
<td>4,0</td>
<td>3,0</td>
</tr>
<tr>
<td>Birth rate in women &gt;35 years (%) ***</td>
<td>20,0</td>
<td>23,9</td>
<td>22,2</td>
</tr>
<tr>
<td>Low weight on birth (%)***</td>
<td>9,4</td>
<td>8,4</td>
<td>8,3</td>
</tr>
<tr>
<td>Child mortality (%)***</td>
<td>7,7</td>
<td>3,5</td>
<td>3,0</td>
</tr>
<tr>
<td>Neonatal mortality (%)***</td>
<td>4,9</td>
<td>2,5</td>
<td>2,1</td>
</tr>
<tr>
<td>Chronic abuse of alcohol (%)****</td>
<td>0,7</td>
<td>0,5</td>
<td></td>
</tr>
</tbody>
</table>

As a heterogeneous area, there are also excellent urban neighbourhoods. One of the most relevant characteristics is the existence of a broad health and social network, where professional network partners interact and cooperate in different areas of interventions namely in the area of maternity and childhood. Partners in health, include the Agrupamento de Centros de Saúde (ACES) da Amadora in Primary Health Care (PHC) network, the Hospital Fernando Fonseca, the Municipality of Amadora and multiple non-governmental organizations, that contribute to a high social capital, many of them having immigrant integration as mission.

According to a study of the Pediatric department of HFF (Machado, 2007) analysing data on 1979 babies born in the hospital between December 2005 and May 2006, 43 % of the children had at least one of the parents with the status of immigrant. These parents could be from 32 different nationalities. Comparing immigrant with non immigrant families, we can observe that the rate of one parent families and of large families was higher in immigrants, and that 65,8% of the Portuguese women were married, comparing with 48,4% in immigrants. The level of scholarity was higher among Portuguese mothers; the rate of families with their own housing was higher in non-immigrant, and of poor housing conditions in immigrant families. The rate of families with smokers and of mothers who smoke, were higher in the non-immigrant group. There was a higher rate of unemployment in immigrant mothers who occupied less complex jobs. A higher rate of immigrant women used exclusively public PHC consultation, comparing with what happened in non-immigrant women (29,25%/21,8%), but 30% of the immigrant women had less than six consultations compared to 22% of the Portuguese women (p < 0,0005). Of the immigrant families 27,8 % were not registered in PHC; 26,2% of their children didn’t had a medical consultation during the first months of life, and only 82,2,% of the children
had a nurse consultation in the two first weeks of life. Many of these women that do not use PHC often appeal to hospital obstetric emergency. Machado suggests that the fact that immigrant women are frequently not registered in PHC, must be due to the fear about the consequences of being illegal, and to the frequent changing of address. These facts associated with difficulties in conciliating schedules, the notion that pregnancy should have a medical follow-up, and the easily access to emergency, could explain why these women appeal to obstetric emergency in the hospital. Perinatal death in this study was of 9.6/00, with a value of 13.1/00 in immigrants and of 7.1/00 in non immigrant women. Concerning prematurity or low birth weight, there are no significant statistical differences between these two groups. Finally, the rate of women infected with HIV was higher in immigrant women. In spite the excellent network of PHC and the multiple non-governmental organizations existing in this area, in a close interaction with the hospital, the study concludes for the need of better understand the reasons for these results, and highlight the need of increasing availability to PHC in these families.

In another study developed by the Pediatric Department of HFF (Carreiro, H, et al 2011 in press), the mothers of low weight babies born in the hospital were studied. The authors concluded that 67 % of these mothers had only basic education (9 years), 24% maintained regular tobacco use during pregnancy, 58% reported intensive physical work during pregnancy, in 19% of the cases pregnancy had not been on PHC consultation and in 29% of the cases there was already a previous child with low birth weight.

To conclude, Amadora is characterized by a very heterogeneous local population, with worrying social and health indicators especially those associated with maternity and the perinatal period, but by a large health and social network.
PART II
ORIGINAL RESEARCH

CHAPTER 2
AIMS AND INTEREST OF THE STUDY, RESEARCH QUESTIONS AND EXPECTATIONS
2. AIMS AND INTEREST OF THE STUDY, RESEARCH QUESTIONS AND EXPECTATIONS

2.1. Aims and Interest of the study

We have argued in the preceding chapters, that research outcomes increasingly point at pregnancy as a period in which crucial building stones are formed for the healthy social-emotional development and well-being of the future child, adolescent and adult. Likewise, risk factors during pregnancy are found to have a significant harmful effect on the developing brain of the child and on the early mother-child relationship. These conditions could result in long term vulnerabilities and increasing the risk of socio-emotional and behavioural problems in the child and during later stages of the life-span. Our special focus in this study is to extend the knowledge on the impact of maternal-fetal attachment and related prenatal risk factors on the postnatal mother-infant relationship and the socio-emotional development of the infant.

This study aims to contribute to the validation and implementation in Portugal of an instrument to assess antenatal psychosocial risk, to be used in PHC. This instrument would allow practitioners to early identify risk situations, what would open the possibility of implementing as early as possible measures to reduce this risk, to strengthen protective factors, and to create better support for the pregnant women, her family and consequently to her baby.

Another relevant point of interest is to understand, in a very specific population such as the one of Amadora, if there are particular groups of pregnant women at risk, and if this risk is associated with malleable determinants.

This would be the first step towards an early Mental Health Promotion Intervention for pregnant women in a special problematic area in a region around Lisbon, with a higher rate of fertility and multiple risk factors, but with also well structured PHC services, clearly sustained in the community.

We also would like to contribute to a better understanding of how maternal-fetal attachment is related with mother-baby interaction after birth, and what the psychosocial determinants are of maternal-fetal attachment and mother-baby interaction, especially emotional availability. This knowledge could provide a better conceptual base for developing an effective intervention to promote secure attachment during pregnancy.
2.2. Research questions

A - In pregnant women, which variables are associated with an increased psychosocial risk, as measured by ALPHA at the beginning of pregnancy?
   - Are the socio-demographic characteristics (age, marital status, immigration status, education) associated with an increased or lower psychosocial risk, as measured by ALPHA?
   - Could we identify among pregnant women specific groups at high risk of psychosocial problems?
   - Do mothers with previous mental health problems, namely depression, minor psychopathology or low sense of coherence have a higher level of global psychosocial risk in the beginning of pregnancy?

B - Which pregnant women are more vulnerable to depression, minor psychopathology or lower sense of coherence?
   - Which socio-demographic characteristics are associated with higher rates of minor psychopathology in the beginning of pregnancy and with higher rates of depression and low sense of coherence in the beginning, in the end of pregnancy, and 6 months after birth?
   - Which psychosocial risk factors assessed by ALPHA, are associated with higher rates of depression and with lower rates of sense of coherence in the end of pregnancy and 6 months after birth?

C - What are the determinants of maternal-fetal attachment at the end of pregnancy?
   - Which populations of pregnant women are associated with poor maternal-fetal attachment at the end of pregnancy?
   - What are their risk and protective factors?

D - What are the determinants of postnatal mother-child interaction, more specifically mother-baby emotional availability?
   - Which populations of pregnant women are associated with poor mother-baby emotional availability for their child?
   - What are their risk and protective factors?

E - Is maternal-fetal attachment related with postnatal mother-child interaction, more specifically with mother-baby emotional availability?
F - Is ALPHA a reliable, valid and feasible instrument for PHC to assess psychosocial risk factors and cumulative psychosocial risk during pregnancy?

2.3. Expectations

Based on the outcomes of our scientific reviews and presented theoretical model, we first expect that very young, immigrant, low-educated and single or divorced pregnant mothers show more psychosocial problems and less mental health. Secondly we expect that pregnant mothers with more psychosocial risk factors, including mental health problems will show less maternal-fetal attachment. Third, we expect that maternal fetal-attachment will be positively related with postnatal mother-child interaction, and more specifically with the mother-baby emotional availability for the child. Fourth, we expect that prenatal risk factors, including mental health problems such as depression, are negatively related with postnatal maternal emotional availability in the mother-child interaction after birth, and that this relation is partly mediated by maternal fetal-attachment. Finally, we expect that sense of coherence will have positively moderating influence on both maternal fetal-attachment and maternal emotional availability after birth.

2.4. Conclusion

According to our previous assumptions, the stated research questions and expectations, with the present study we first aim to prove that ALPHA is a valid, reliable and feasible instrument to be used for prenatal psychosocial risk assessment in PHC; secondly, to contribute to a better comprehension of the relation between prenatal risk factors and maternal mental health, with prenatal fetal attachment and mother-child interaction after birth. We pretend to understand the contribution of distal factors that can be the target of a Public Health approach to proximal factors involved in mother-baby interaction before and after birth.
PART II
ORIGINAL RESEARCH

CHAPTER 3
METHODOLOGY
3. METHODOLOGY

3.1. Introduction

In this study in maternal health consultation in PHC at Amadora, we started with assessing the socio-demographic characteristics of pregnant woman and their partners, the level of prenatal psychosocial risk, prenatal depression and minor psychopathology and also sense of coherence. This first assessment was done at the beginning of pregnancy. The women were reassessed at the end of pregnancy in order to evaluate maternal-fetal attachment, depression and sense of coherence.

After delivery, in the sixth month of the baby, we assessed mother-baby relationship, evaluating emotional availability between them. We also assessed again depression and sense of coherence.

As described in the previous chapter, we aim to understand if a higher level of psychosocial risk (evaluated using ALPHA) and some socio-demographic characteristics (i.e. age, marital situation, years of education or immigrant status), influence maternal-fetal attachment and later six months after birth, the emotional availability between mother and child. We also will study if maternal-fetal attachment influences mother-baby emotional availability. Other relevant questions are how psychosocial risk or some socio-demographic factors are associated with or interact with depression, minor psychopathology, or sense of coherence.

3.2. Participants

The study sample was composed of 92 pregnant women and their babies recruited at the maternal health consultation of PHC centres (Damaia, Buraca and Reboleira), all belonging to ACES Amadora, in the period between April and November 2009.

All the pregnant women that consecutively were admitted to maternal health consultation, with less than 12 weeks of pregnancy and who accepted to participate, were included in the study. We adopted as exclusion criteria, the inability to speak or understand Portuguese and refusing to participate in the study.

It was a sample of convenience, not randomized or incidental. Therefore, this sample cannot be considered representative of the Portuguese population. This is especially the case due to the high percentage of immigrants and also by the fact that this is a population with multiple risk factors. It's a specific population, which characteristics and health indicators have been described in chapter 1 of Part II.
3.3. Study design and process

The study has been developed in the PHC Centres of Damaia, Buraca and Reboleira, authorized and supported by the Coordinator of the Executive Council of the ACES Amadora. The protocol was submitted to the Ethic Commission of the ARSLVT and was approved without modifications.

Family doctors and nurses of the maternal health consultation in PHC, were informed about the study, its objectives and methodology, as well as the coordinators of the Unidade Coordenadora Funcional (UCF) Amadora, and the Director of the Women's Department of Fernando Fonseca Hospital. UCF Amadora is a structure responsible for integrating obstetric and paediatric care in the region, with professionals from PHC and also from HFF.

In each PHC centre, the pregnant women were approached by the research team after being signalized by her general practitioner or nurse in the maternal health consultation and invited to participate in the study.

Each woman has been assessed at three moments, namely in the beginning of pregnancy, in the end of pregnancy and six months after birth.

The first assessment (T1) occurred in the first contact with the researchers, until 12 weeks of pregnancy.

The second interview that occurred at the end of pregnancy, between 30 and 40th week of pregnancy (T2), was arranged during the first assessment, at a date that overlaps an appointment at the maternal health consultation. Closer to the planned date, the pregnant woman received a phone call, reminding her to the next scheduled assessment.

After delivery, the woman was contacted again by the research team in order to schedule a third assessment, this time with the baby.

In the third assessment (T3), 6 months after birth, mothers filled in a questionnaire and also some questions about the birth and the baby, and an interaction between mother and baby was videotaped. The session occurred in the PHC centre, in an appropriately decorated room to make mother and baby comfortable. The video lasted around 20 minutes, and had two parts: the first part, only with direct mother-baby interaction and the second part introducing toys appropriated for the age of the baby.

The women signed an informed consent form, and in all the interviews was explained the purpose of the study, the possibility of rejection and the need to videotape mother-baby interaction, for which permission was specifically obtained. The investigators explicitly assured the confidentiality of the data.
Recruitment and training of interviewers

Two psychologists and three psychomotor therapists with training in mental health were recruited for the application of the instruments used in the first two assessments. During their training, we discussed the interview protocol, the description of the instruments to be used and their scores, and we proceeded with an interview training using role-playing. Ethical issues were also addressed, particularly those related to hypothesis of refusal and the use of informed consent. Throughout the study regular weekly meetings with the interviewers have been done checking criteria or solving questions or other issues related to the development of the study. We assured that all the interviewers used a similar procedure, and during the study the quality of the registered forms has been assessed regularly. One of these professionals was later responsible for the assessment after delivery, and for that reason she had a specific training to conduct videotaping of mother-infant interaction, which served as the basis for the evaluation of mother-baby emotional availability.

This is an observational, descriptive and analytical study.

3.4. Measures

3.4.1. Socio-demographic and services data

Socio-demographic data (Appendix 1) were registered in the first assessment using a form that included the name of the woman, her age, birthplace, immigrant status and, if so, if she is a first or second generation immigrant, the date of last menses (for calculating the duration of pregnancy), age and profession of the father, and the name of the PHC Centre, of her general practitioner and nurse. Marital status, years of education, family income, type of residence, occupation and current employment status were also collected. During the study we also recorded the dates of the various assessments, the drop-outs during these assessments and reasons why, and the date, place and type of delivery. Information about delivery characteristics and neonatal risk, was obtained through consultation of clinical processes at HFF.

For statistical analysis some variables were recoded, namely:

- Marital status - was dichotomized as 0 (single or divorced) and 1 (married or living with a partner);
- Nationality - was dichotomized into Portuguese (0) and not Portuguese (1);
• Immigrant status - was dichotomized into non immigrant (0) and immigrant (1)

3.4.2. Instruments

The instruments that were used for assessing the different conceptual dimensions in this study are listed in Table II.3.1, as well as its authors and the moments they were used.

**Table II.3.1 - Dimensions and Instruments**

<table>
<thead>
<tr>
<th>DIMENSIONS</th>
<th>INSTRUMENTS</th>
<th>AUTHORS</th>
<th>MOMENTS OF ASSESSMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psycho-social risk during pregnancy</td>
<td><strong>ALPHA : Antenatal Psychosocial Health Assessment</strong></td>
<td>The ALPHA Group Midner, D (2005)</td>
<td>T1</td>
</tr>
<tr>
<td>Depression</td>
<td><strong>EDPS : Edinburgh Postnatal Depression Scale</strong></td>
<td>Cox et al. (1987); portuguese version: Areias (1996)</td>
<td>T1,T2,T3</td>
</tr>
<tr>
<td>Minor psychopathology</td>
<td><strong>GHQ 12: General Health Questionnaire</strong></td>
<td>Goldberg &amp; Williams (1988)</td>
<td>T1</td>
</tr>
<tr>
<td>Sense of coherence</td>
<td><strong>SOC: Questionário de Sentido de Coerência</strong></td>
<td>Antonovsky (1993); portuguese version: Nunes (1999)</td>
<td>T1,T2,T3</td>
</tr>
<tr>
<td>Mother-baby interaction</td>
<td><strong>EAS : Emotional Availability Scales 0 to 5</strong></td>
<td>Biringen Z (2008)</td>
<td>T3</td>
</tr>
</tbody>
</table>

3.4.2.1. Antenatal Psychosocial Health Assessments (ALPHA)

According to the methodology described in the protocol, we used the Psychosocial Antenatal Health Assessment (ALPHA), an instrument that identifies psychosocial risk factors, grouped in family risk factors, maternal risk factors, risk related to substance abuse and family violence. For each of the 15 questions concerning the presence of a risk factor, the observer must code **low** if he thinks there is no risk at all, **some** if he admits the possibility of risk but needs to clarify it, and **high** if he thinks that a certain risk factor exists, and implies an additional professional intervention.

In each subgroup of risk factors, it is possible to get a score that identifies the risk level. These subgroups include family risk (ALPHA F), maternal risk (ALPHA M), risk related to substance abuse (ALPHA SA) and the risk associated with family violence (ALPHA FV). We also used a
score, Total ALPHA that results from the sum of all the items, which quantifies the total number of risk factors and the severity of risk.

As mentioned in chapter 5, Part I, ALPHA was developed by a multidisciplinary team of general practitioners, obstetricians, midwives and nurses in Canada, as a way of obtaining psychosocial data on risk factors during pregnancy in a structured, logical and cost-effective way (Reid, et al., 1998). The ALPHA has two versions: one is a self report filled by the mother and the other by a professional observer. The authors identified a number of factors that, according to the literature, are associated with negative outcomes such as postpartum depression, child abuse, women abuse, couple dysfunction and physical illness. At the end of the scale, a list of optional resources in the community is added to identify what resources the pregnant women could use to deal with the identified problems.

As it was mentioned before in chapter 5 part I., Carrol et al (2005) advocate the dichotomy of the responses in 0 (low risk) and 1 (some or high risk) for research purposes. The authors recommend the use of the ALPHA to detect psycho-social risk, but not the use of subscales. So far, this instrument has been used in the detection of specific risk factors and not for computing the total number of risk factors like we did in our study.

Although some critics have raised recently, highlighting the fact that ALPHA assessment properties have not been sufficiently studied, yet a study in Canada is currently ongoing (Kinsdom,, 2014) that will answer many of these questions.

Development of the Portuguese version of the ALPHA

For the development of the Portuguese version of ALPHA, we used the methodology advocated by the WHO, including the following steps:

1. ALPHA translation from English to Portuguese. This translation was improved by the comments of a certified translator who revised the translation.
2. Reverse translation to English by a certified native translator of English.
3. Review of this release by one of the authors of the scale that approved the Portuguese version.
4. The Portuguese version was then reviewed by a focus group, integrating professionals from the maternal health consultation at the PHC at Fernão Ferro, in the Municipality of Almada, namely general practitioners, nurses, a psychologist and a public health doctor, that included minimal modifications to the document, related with the Portuguese redaction. According to their opinion, ALPHA is easy to understand, adequate and able to be integrated in clinical care, and useful as close to their needs and expectations.
5. The process of retroversion was repeated and the new version was sent to the Canadian authors, obtaining their final approval.

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The Portuguese version was implemented and its reliability was checked. As we used a summated score of risk, we calculated Cronbach’s alpha of ALPHA obtaining a value of .721. We also computed the Cronbach’s alpha for each subscale of ALPHA except for substance abuse, because it has only one item. We obtained a value of .561 for family factors subscale; a value of .384 for maternal factors subscale and a value of .572 for family violence subscale.

3.4.2.2. Edinburgh Postnatal Depression Scale

The Edinburgh Postnatal Depression Scale EDPS (Cox et al 1987) is a scale consisting of 10 questions coded from 0 to 3, with a sum score ranging from 0 to 30, representing the level of depression in the previous week. It was developed for postpartum depression screening, but was also validated for being used during pregnancy (Murray & Cox, 1990). It has been widely used in different cultures and has been translated into several languages. In several studies, EDPS has shown a good reliability and sensitivity. This scale was also validated for Portugal (Areias et al 1996), where it is currently widely used.

In this validation process on 410 women of the Oporto area, an average score was found of 7.2 (± 4.7), similar to the value described in other studies (Murray & Carothers, 1990). The cut-off suggested in the literature for identifying depression ranges from 10 to 13 points (Cox et al 1987). In agreement with the recommendations by Murray & Cox (1990), and adopted by the Portuguese Direcção Geral da Saúde (Ministério da Saúde 2005) we used a cut-off of 12 to dichotomize the results, 0 corresponding to a value less than 12 (low level of depression) and 1 to a value higher than or equal to 12 (high level of depression). We evaluated the reliability of the EDPS at each of the three assessments in our study, obtaining a Cronbach’s alpha of .800 for T1, of .728 for T2 and of .711 at T3.

3.4.2.3. General Health Questionnaire – 12 items version

The General Health Questionnaire (GHQ) (Goldberg & Williams, 1988), is a questionnaire that assesses the existence of psychiatric morbidity in the previous four weeks. There are different versions of GHQ, namely with 12 items (Jacob et al, 1997), 28, 30 (Goldberg, 1972) and 60 items. The GHQ does not allow a clear psychiatric diagnosis, but evaluates the potential psychological distress, especially the existence of anxiety and depression. The overall score quantifies the severity of these symptoms. Although GHQ does not allow a psychiatric diagnosis it’s very useful as screening instrument to measure psychiatric burden and to identify potential cases with psychiatric morbidity.
There are several ways to score the items:

- The conventional method (GHQ original / GHQ org) in which the response categories of the items are scored as 0-0-1-1, and the total score ranges from 0 to 12 indicating the degree of psychopathological burden;
- the Likert method (GHQ Likert / GHQ lik) in which the scoring of the responses to each item can be 0-1-2-3, with the total scores ranging from 0 to 36;
- the revised or corrected method (GHQ corrected, GHQ c), in which the items that measure health are scored as 0-0-1-1, and items that measure disease are scored as 0-1-1-1.

Goldberg et al (1997) compared the two versions of 12 and 28 items, and showed no great advantage in using the release of 28 items, except when trying to analyze the subscales. In this WHO study involving 15 international centres and 5348 patients, the corrected method (GHQc), offered no advantages compared to the other versions; the sensitivity was 76.3%, the specificity 83.4% and the threshold for detection of 2/3. The threshold recommended varied in different European Centres, since it was 1/2 in Paris and Verona, 2/3 and 3/4 in Berlin Manchester. The best cut-offs were 1/2 for GHQ original, 4/5 for GHQ corrected, and 11/12 for GHQ likert.

Regarding the 12-item version, Piccinelli et al (1993) demonstrated that its sensitivity ranged from 71 to 75% and the specificity from 73 to 76%, and that the best results were obtained by combining GHQ original and GHQ corrected; the isolated use of GHQ corrected did not prove to increase validity.

We decided to use the version of 12 items, because of the evidence of its robustness for tracking potential cases, and the brevity of filling, which becomes relevant when a large number of instruments are being used. We used the original version, and later dichotomized the scores of the responses into 0 and 1 (0 and 1 =0, and 2 and 3 = 1), with a maximum sum score of 12 points.

The cut-off recommended by several authors as a screening instrument for this version of the scale is 2/3, according to other European studies (Jacob et al,1997) and Portuguese studies (Gonçalves Pereira et al, 2010). The cut-off 1/2 has demonstrated less specificity and an increased number of false positives.

The Cronbach’s alpha obtained in this study was of .793.

3.4.2.4. Sense of Coherence

The “Orientation to Life Questionnaire”, which assesses the internal Sense of Coherence (SOC), was developed by Antonovsky (1998b). According to this author SOC can be define as “a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that (1) the stimuli deriving from one’s internal and external
environments in the course of living are structured, predictable and explicable; (2) the resources are available to one to meet the demands posed by these stimuli; and (3) these demands are challenges, worthy of investment and engagement (Antonovsky, 1987). It’s a self-rating scale with two versions, the expanded 29 items version and the simplified 13 items version (Sjostrom et al 2004). Each item that is part of the scale is coded as Likert scale of 1-7.

As was described before, the expanded version includes three subscales, comprehensibility, manageability and meaningfulness.

Comprehensibility refers to the extent to which individuals perceive the stimuli that confront them as making cognitive sense, as ordered information, consistently structured and clear - and hence, regarding the future as predictable – rather than as nosy, chaotic, disordered, random, accidental or unpredictable.

Manageability refers to the extent to which people perceive that resources that are at their disposal are adequate to meet demands posed by stimuli.

Meaningfulness refers to the emotional counterpart of comprehensibility. People who are high on meaningfulness feel that life makes emotionally sense, that at least some of the problems and demands posed by living are worth investing energy in, and are challenges that are welcome rather than burdens that they would much rather do without.

Comprehensibility includes 11 items, manageability includes 10 items, and meaningfulness includes 8 items. These subscales were created by the author based on the model that underlies this scale. A high score reflects a high sense of coherence (Antonovsky 1984).

According to Langius et al (1996), cited by Sjostrom et al (2004), we can differentiate three levels of sense of coherence:
- Low sense of coherence - Total SOC scores between 35 and 60;
- Moderate sense of coherence - Total SOC scores between 61 and 75;
- High sense of coherence - Total SOC scores between 76 and 91;

Eriksson & Linstrom (2005), reviewed several studies and demonstrated that the mean scale scores ranged from 35.39 (± 0.10) to 77.6 (± 13.8) for the 13 items version, and secondly from 100.5 (± 28.5) to 164.5 (± 17.0) for the 29 item version. This instrument has been widely used in various cultures, assessing the ability to handle stressful situations (Eriksson & Linstrom, 2005, 2006, 2007). Studies of Antonovsky 1987, have provided evidence for a high internal consistency (Cronbach’s alpha 0.84 to 0.93). Research outcomes are not clear about the advantages, or risks of using the subscales or the 13 items version (Klepp et al 2007).
We used the version of 13 items, translated in Portuguese and validated by Nunes (1998). In our study we found a Cronbach’s alpha of .725 at T1, of .770 at T2, and of .775 at T3, lower than the Cronbach alpha obtained by Nunes (1999) between .83 and .90.

### 3.4.2.5. Maternal-Fetal Attachment Scale

The Maternal-Fetal Attachment Scale (MFAS) consists of 24 items that, according to the author “measure the extent to which pregnant women engage in behaviours that reflect an affiliation and interaction with their unborn child” (Cranley, 1981). Each statement can be scored from one to five points, with five points representing the optimal response. The total score can range from 24 to a maximum of 120 points.

This scale was initially developed by Cranley (1981) and subsequently translated and validated for Portuguese pregnant women (Mendes 2002). The questions can be grouped into five subscales: (1) ‘differentiation of self from the fetus’ (4 items), (2) ‘interaction with the fetus’ (5 items), (3) ‘attributing characteristics and intentions to the foetus’ (6 items, e.g. ‘it seems the baby kicks and moves just to keep me from resting’), (4) ‘giving of self’ (5 items), (5) ‘role-taking’ (e.g. ‘I picture myself feeding the baby’, 4 items) (van den Bergh & Simons, 2009).

According to Cranley (1981) the total scale has a Cronbach’s alpha coefficient of 0.85. For the subscales she reported a Cronbach’s alpha that varies from 0.51 to 0.73. However, the subscales were not based on factor analyses, but were theoretically derived, as van den Bergh & Simons (2009) stress in their recent review on scales to measure prenatal attachment. They conclude that the Cronbach’s alpha varies between .76 and .91 for the total scale, and from .41 to .89 for the original subscales. Müller and Ferketich (1993) also believe that the psychometric properties of the MFAS are suitable only when using the total score. In their study with two groups of 371 and 310 pregnant women, they did not achieve to validate the subscales. According to these authors, the maternal-fetal connection should be understood as a one dimensional construct, without using the subscales.

MFAS was widely used in multicultural studies (Ahern & Rulland 2013; Alhusen 2012) and in populations with economic difficulties (Curry, 1987; Lindgren, 2001). Mendes (2002), in Portugal conducted a study with 220 pregnant using the Portuguese version of MFAS. Mendes also concluded that MFAS should be used as a one dimensional construct, finding a value of Cronbach’s alpha coefficient of 0.82.

As a conclusion, Grace (1989), and Muller and Ferketich (1993) recommend the researchers to be careful on the use of the specific subscales, because subscales didn’t proof clearly to predict what they pretended to, and suggest that MFAS is still an ongoing process.

In our study we obtained a Cronbach’s alpha of .771 for the global MFAS.
3.4.2.6. Emotional Availability Scales

To assess the quality of mother-infant interactions, we videotaped mother-baby interactions and used the Emotional Availability Scales (EAS), Infancy / early childhood version 0 to 5 years (Biringen, Robinson & Emde, 1998) to code the interaction. The EAS were initially developed for older children, but there was a posterior development for the use from the first days of life up to 5 years. They include six scales that assess the sensitivity, structuring, hostility and intrusiveness of the mother, and the responsiveness and involvement of the baby. The EAS is worldwide used in many studies on mother-infant interactions and attachment.

The sensitivity scale assesses the ability of the mother to be affectionate and emotionally attached to the child; structuring refers to how the adult appropriately structures the child’s play, taking over or following the will of the child and placing appropriate limits to their behaviour; intrusiveness refers to how the adult interacts with the child providing it a adequate frame or scaffold for interaction; hostility assesses the degree of light or subtle hostility towards the child; child’s; responsiveness measures the positive affection, emotional regulation and organization of affection and behaviour on the part of the child and its response to the interplay with the adult, and finally child’s involvement assesses the child ability to attend and engage in the relationship with the adult.

These scales have a score from 1 to 7, where 7 represents a high quality of interaction, 5 or 6 a moderate level, and less than 5 levels clearly reflect inconsistency or insufficient or disturbed interaction. For purposes of statistical analysis these values were sometimes dichotomized on 0 or 1, where 0 corresponds to scores lower than 5, and 1 to scores greater than or equal to 5. Several studies have demonstrated the existence of a good reliability and validity of EAS (Biringen et al, 2005; Easterbrooks, Biesecker & Lyons-Ruth, 2000).

**Preparation of Emotional Availability Scales**

To use the EAS, we had first to contact Zeynep Biringen, the author of the scales, requesting permission to use them. The author realized the 4th Edition training in the use of the scales held by the author, via internet, and the final evaluation of the course. This training allows us to use EAS, and also provide us the opportunity to clarify some questions with the author via Skype.

We also presented the study to the scale’s author and discussed with her how to use them, and the videotape interaction. We proceeded to the implementation of the necessary conditions for videotaping mother-infant interaction in the PHC Centre. Finally, all the films were coded by two researchers trained in the 4th Edition of EAS by Prof. Zeynep Biringen, myself and Dr. Karin van Doesum of the Radboud University in Nijmegen.
Each video was coded independently by the two observers that were blind to the results of other measures in the study. Disagreements have been discussed and consensus scores obtained. All videos were rated by two observers and the inter-observer reliability was of 100%.

3.5. Statistical analysis

The correct data entry in the database has been confirmed randomly, assuring reliability of data. We performed a descriptive analysis of all relevant variables, followed by an inferential study using parametric hypothesis tests, namely t student tests. To study the linear relationship between quantitative variables, we used the Pearson coefficient. The construction of the multiple linear regressions was conducted according to Hosmer and Lemeshow (2000) recommendations:

1- Individual analysis of each independent variable by Wald statistic;
2- All variables with p value<0.25 were considered as potential candidates, and a model with these was adjusted;
3- After this adjustment several elimination, adjustment and coefficient verification cycles were performed, beginning with the elimination of the variable with the highest p value. This progressive elimination was repeated until all variables were significant at 0.1. At this point the variables that initially had a p value <0.25 were adjusted to investigate if they change the significance, now that they are adjusted together with other variables;
4- After the main effects model was obtained, the linearity of the continuous variables with the logic assumption was studied when applicable.
5- The fit of the model was assessed with Hosmer and Lemeshow statistic for the goodness of fit, with likelihood ratio test,
6- A residue analysis was conducted in order to detect possible outliers and/or influential points

Global interactions between variables were not studied once they increase significantly the difficulty in the model interpretation.

We used also multiple logistic regression when it was possible to dichotomise the dependent variable.

Software was used StataCorp. 2009. Stata Statistical Software: Release 11. College Station, TX: StataCorp LP.
PART II
ORIGINAL RESEARCH

CHAPTER 4
RESULTS
The statistical analysis has been done according the following plan:
- Descriptive analysis of all the variables to be studied;

- Analysis of correlation:
  We have proceeded to a correlation analysis between different variables according to the different research questions.
  Univariate logistic regression:
  In the cases where the dependent variables can be dichotomized, we performed also a univariate logistic regression analysis.

- Multiple linear regression analysis:
  In order to understand what the contributions were of different significant predictors in explaining the variance of a certain dependent variable in our study, we performed a multiple linear regression analysis.
PART II
ORIGINAL RESEARCH

CHAPTER 4
RESULTS

4.1. DESCRIPTIVE STATISTICS
4.1. DESCRIPTIVE STATISTICS

4.1.1. Participation and drop-out

According to the criteria defined by the study protocol, 99 pregnant women of the maternal health consultation in the three PHC Centres where the research took place, were contacted during the period between April to November 2009. Three refused to participate in the study and four had already surpassed the time of pregnancy defined as inclusion criteria for the first evaluation, so they could not be included.

The flow chart of the study is outlined in figure II.4.1, where it’s also possible to observe the variation in the size of the sample, in the three times of evaluation.

Figure II.4.1 – Flowchart of study participation and dropout
Thus, 92 pregnant women constituted the initial sample, the first assessment (T1) occurred until 12 weeks of pregnancy, the second (T2) at the end of pregnancy between 30 and 40 weeks, and the third (T3) after delivery in the 6th month of life.

As it can be seen in figure II.4.1, from the initial 92 pregnant, only 58 concluded the three phases of evaluation. If we analyze the reasons for not attending the assessments we note the following:
- 9 pregnant women performed the first two assessments, not attending the third for different reasons (five missed the appointment even when contacted again, one refused, two had changed their residence to places far away, and one was impossible to contact);
- 7 pregnant women missed the second evaluation (four missed the appointment, one was impossible to contact, and two had preterm births before the scheduled date of assessment), but attended the third evaluation;
- 18 completed only the first appointment (for fetal death in three cases, two missed both appointments after several contacts, seven were impossible to contact, three refused to participate - one for preterm birth and later missing the other appointments, and two by change of residence to distant places).

Even in cases where the initial assessment was missed, at T2 the researchers always tried to reassess mother and baby at T3, what happened in the 7 cases described.

4.1.2. Socio-demographic characteristics of pregnant women in early pregnancy

The socio-demographic characteristics of the 92 pregnant women who constituted the initial sample are summarized in table II.4.1. We observe that they had an average age of 27.8 (± 5.8) years, with a median of 28 years and that 55 (59.8%) were of Portuguese nationality, which also corresponded to the rate of non-immigrants in the population of Amadora (see Health local indicators, chapter 1, part II). A high prevalence of immigrants in this sample is expected in the municipality of Amadora, as well as the fact that the highest percentage matched women from Cabo Verde (19.6%; n=16)). In the total sample, 32 belonged to 1st immigrant generation and 5 to 2nd immigrant generation. Regarding marital status we can see that 23 are unmarried or separated, representing almost 25% of the sample. The level of education is low (although the years of scholarship can go up to 18 years), as the average is 9.7 years of schooling, with a median of 9 years. Although it was not possible to quantify reliably household income, it was found that only 71.7% of the cases had a regular income, as in other cases the income may be uncertain, dependent on social security, corresponding to situations of greater vulnerability. Regarding employment situation, 21.7% were unemployed, and 5.4% were students or housewives.

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**Table II.4.1 – Socio-demographic characteristics of pregnant women (n=92)**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years)</strong></td>
<td>mean (SD) 27.8 (± 5.8), median 28</td>
</tr>
<tr>
<td></td>
<td>min-max: 18-46</td>
</tr>
<tr>
<td><strong>Nationality</strong></td>
<td>Portuguese: 55 (59.8%)</td>
</tr>
<tr>
<td></td>
<td>Cabo Verde: 18 (19.6%)</td>
</tr>
<tr>
<td></td>
<td>Brasil: 7 (7.6%)</td>
</tr>
<tr>
<td></td>
<td>S Tome e Principe: 4 (4.4%)</td>
</tr>
<tr>
<td></td>
<td>Angola: 3 (3.2%)</td>
</tr>
<tr>
<td></td>
<td>Guiné: 3 (3.2%)</td>
</tr>
<tr>
<td></td>
<td>Moçambique: 1 (1.1%)</td>
</tr>
<tr>
<td></td>
<td>Senegal 1 (1.1%)</td>
</tr>
<tr>
<td><strong>Immigrant status</strong></td>
<td>non-immigrant: 55 (59.8%)</td>
</tr>
<tr>
<td></td>
<td>Yes, 1st generation: 32 (34.8%)</td>
</tr>
<tr>
<td></td>
<td>Yes, 2nd generation: 5 (5.4%)</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td>Single: 22 (23.9%)</td>
</tr>
<tr>
<td></td>
<td>Married: 22 (23.9%)</td>
</tr>
<tr>
<td></td>
<td>Cohabitant: 47 (51.1%)</td>
</tr>
<tr>
<td></td>
<td>Separated: 1 (1.1%)</td>
</tr>
<tr>
<td><strong>Scholarity (years)</strong></td>
<td>Mean (SD) 9.7 (± 3.7), median 9</td>
</tr>
<tr>
<td></td>
<td>min-max 0 to 18</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td>Regular: 66 (71, 7%)</td>
</tr>
<tr>
<td></td>
<td>Uncertain, Social Security other: 26 (28.3%)</td>
</tr>
<tr>
<td><strong>Employment situation</strong></td>
<td>Worker on behalf of another: 63 (68.5%)</td>
</tr>
<tr>
<td></td>
<td>Unemployed: 20 (21, 7%)</td>
</tr>
<tr>
<td></td>
<td>Student, housewife: 5 (5.4%)</td>
</tr>
<tr>
<td></td>
<td>Self-employer : 4 (4.4%)</td>
</tr>
</tbody>
</table>

The fathers of the babies to born were also characterized with respect to age and employment status, concluding that they had an average age of 30.48 years (± 6.4), ranging from 17 to 44 years, with a median of 30 years. Regarding employment status 9 (9.8%) of them were unemployed.

According to the high rate of immigrant women in the sample, we compared socio-demographic characteristic of immigrant with non-immigrant pregnant women what can be observed in table II.4.2. In the second generation of immigrant women we can observe a higher rate of single or divorced women, but these results are not statistically significant according to the small number of second generation immigrant women.
Table II.4.2 – Socio-demographic characteristics of immigrant/ non-immigrant pregnant women

<table>
<thead>
<tr>
<th></th>
<th>Non immigrant (n=55)</th>
<th>1st generation Immigrant (n=32)</th>
<th>2nd generation Immigrant (n=5)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mean (sd); Median</td>
<td>27,4 (±6,0); 28</td>
<td>28,88 (±5,3); 28</td>
<td>26,8 (±7,5); 24</td>
</tr>
<tr>
<td><strong>Scholarity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mean (sd); Median</td>
<td>10,1 (±4,05); 9</td>
<td>9,09 (±3,15); 9</td>
<td>8,8 (±3,7); 9</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-single, divorce</td>
<td>13; 24,6%</td>
<td>8; 25%</td>
<td>2; 40%</td>
</tr>
<tr>
<td>1-married; cohabitant</td>
<td>42; 76,4%</td>
<td>24; 75%</td>
<td>3 ; 60%</td>
</tr>
<tr>
<td><strong>Nationality</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portugal</td>
<td>55</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Cabo Verde</td>
<td>0</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>Brasil</td>
<td>0</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Angola</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Moçambique</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>S. Tomé</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Senegal</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

4.1.3. Psychosocial risk in early pregnancy – ALPHA at T1

According to the methodology described we used the Psychosocial Antenatal Health Assessment (ALPHA) that identifies the existence of psychosocial risk factors, grouped into family risk factors, maternal risk factors, risk related to substance abuse or family violence. The different items were rated at 0, 1 or 2 according to no risk (0), low risk (1) high risk (2).

We can observe in table II.4.3, that in relation to family risk factors (ALPHA F), 25% of pregnant women identified lack of social support, 34.8% the existence of stressful life events, and 21, 7% risk in the couple’s relationship.

Concerning maternal risk factors (ALPHA M), 34.8% of pregnant women reported late start of prenatal care, 14.2% refused or quitted prenatal education, 34.8% have still unclear feelings in relation to their baby at 20 weeks of pregnancy, 22.8% reported difficulties in relationships with parents during their childhood, 29.4% identified a low self-esteem, 23.1% had a psychiatric history, and 38% a history of depression during this pregnancy.

In the pregnant women evaluated, 7.6% are at increased risk due to current substance use (ALPHA SA).

Regarding the risk associated with family violence (ALPHA FV), we can see that according to their own self-report 16.3% have been victim or witness of abuse during their childhood, 14.1%
are presently, or were in the past victim of abuse during their adulthood, in 5.4% of the cases their children were victim of abuse by the woman or her partner, and 4.3% reported that their parenting was of great rigidity and discipline.

In what concerns total ALPHA we obtained a mean value of 3.29 (±0.3) with a median of 3.

Table II.4.3 - Assessment of psychosocial risk in early pregnancy - ALPHA at T1 (n=92)

<table>
<thead>
<tr>
<th></th>
<th>ALPHA (0,1,2)</th>
<th></th>
<th>ALPHA (0,1)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FAMILY FACTORS (ALPHA F)</strong></td>
<td>mean (sd) 0,93 ±0,1</td>
<td>median 0; min-max 0-4</td>
<td>0 no risk -69 (75%)</td>
</tr>
<tr>
<td>F1 Lack of social support</td>
<td>0 no risk - 69 (75%)</td>
<td>1 no risk -82 (84%)</td>
<td>0 no risk -69 (75%)</td>
</tr>
<tr>
<td>F2 Stressful life events</td>
<td>0 no risk -60 (65,2%)</td>
<td>1 no risk -32 (34,8%)</td>
<td>0 no risk -60 (65,2%)</td>
</tr>
<tr>
<td>F3 Couple’s relationship of risk</td>
<td>0 no risk -72 (78,3%)</td>
<td>1 no risk -20 (21,7%)</td>
<td>0 no risk -72 (78,3%)</td>
</tr>
</tbody>
</table>

| **MATERNAL FACTORS (ALPHA M)** | mean 1,6 ±1,7 | median 1; min-max (0-5) | 0 no risk -60 (65,2%) |
| M1 Prenatal care (late onset) | 0 no risk -60 (65,2%) | 1 no risk -32 (34,8%) | 0 no risk -60 (65,2%) |
| M2 Prenatal education (refusal or quit) | 0 no risk -79 (85,9%) | 1 no risk -13 (14,2%) | 0 no risk -79 (85,9%) |
| M3 Feelings towards pregnancy after 20 weeks | 0 no risk -60 (65,2%) | 1 no risk -32 (34,8%) | 0 no risk -60 (65,2%) |
| M4 Relationship with parents in childhood | 0 no risk -71(77,2%) | 1 no risk -21 (22,8%) | 0 no risk -71 (77,2%) |
| M5 self esteem | 0 no risk -65(70,7%) | 1 no risk -27 (29,35%) | 0 no risk -65 (70,7%) |
| M6 History of psychiatric/emotional problems | 0 no risk -68(73,9%) | 1 no risk -24 (23,1%) | 0 no risk -68 (73,9%) |
| M7 Depression in pregnancy | 0 no risk -57(62%) | 1 no risk -35 (38%) | 0 no risk -57 (62%) |
### SUBSTANCE ABUSE (ALPHA SA)
- **Mean**: 0.1±0.4; median 0; min-max 0-2
- **Risk Levels**:
  - 0 no risk - 85 (92.4%)
  - 1 low risk - 4 (4.3%)
  - 2 high risk - 3 (3.3%)

### FAMILY VIOLENCE (ALPHA FV)
- **Mean**: 0.45±0.09; median 0; min-max 0-5
- **Risk Levels**:
  - FV1 Woman or partner experienced or witnessed abuse:
    - 0 no risk - 77 (83.7%)
    - 1 low risk - 10 (10.9%)
    - 2 high risk - 5 (5.4%)
  - FV2 Current or past woman abuse:
    - 0 no risk - 79 (85.9%)
    - 1 low risk - 9 (9.8%)
    - 2 high risk - 4 (4.3%)
  - FV3 Previous child abuse by woman or partner:
    - 0 no risk - 87 (94.6%)
    - 1 low risk - 4 (4.3%)
    - 2 high risk - 1 (1.1%)
  - FV4 Child discipline:
    - 0 no risk - 88 (95.7%)
    - 1 low risk - 3 (3.2%)
    - 2 high risk - 1 (1.1%)

### TOTAL ALPHA
- Mean 3.29±0.3; median 3; min-max 0-12

4.1.4. Depression assessment – EDPS at T1, T2, T3

The Edinburgh Postnatal Depression Scale (EDPS), was utilized at each of the three moments of assessment. To facilitate interpretation of the data, results of the three assessments are presented together (table II.4.4).

Over the three assessments there was a progressive decrease in the average and median of EDPS; the mean values were always below the cut-off of 12 suggested in the literature to identify patients with depression.

As stated in the previous paragraph, and according to the literature, we dichotomized the results, with 0 corresponding to a value of less than 12 (low level of depression) and one of to a value higher than or equal to 12 (high level of depression). In this sample, according to this cut-off, 19.57% of pregnant women in early pregnancy, 7.69% in late pregnancy and postpartum 7.94% after delivery had values of EDPS greater or equal to 12.
Table II.4.4 - Depression at T1, T2 and T3 assessed by EDPS

<table>
<thead>
<tr>
<th></th>
<th>Early pregnancy T1 (n -92)</th>
<th>End of pregnancy T2 (n -67)</th>
<th>6 months after delivery T3 (n- 65)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EDPS (0-30)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average (sd); median (min-max)</td>
<td>7,30 (±4,88);7 (0-25)</td>
<td>6,15 (±3,9); 6 (0-19)</td>
<td>5,26 (±3,4);5 (0-14)</td>
</tr>
<tr>
<td><strong>EDPS (0,1)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 – high EDPS ≥12</td>
<td>18 (19,57%);</td>
<td>5 (7.69 %)</td>
<td>5 (7.94%)</td>
</tr>
<tr>
<td>0 – low EDPS &lt; 12</td>
<td>74 (80.43%);</td>
<td>60 (92.31%)</td>
<td>58 (92.06%)</td>
</tr>
</tbody>
</table>

Assessment of depression in the 58 pregnant women who completed all three phases of evaluation

To understand if the decrease in depression level over the three assessments was due to the fact that the most depressed women could be lost to follow-up, creating a bias in the data analysis, we performed an analysis of the evolution of the EDPS of the 55 pregnant women who have participated in all the three assessments. At table II.4.5 we can observe the same effect of a reducing mean and median of the EDPS across time, excluding this hypothesis.

Table II.4.5 - Depression at T1, T2 and T3 on women who completed the three evaluations (n-58)

<table>
<thead>
<tr>
<th></th>
<th>Early pregnancy T1</th>
<th>End of pregnancy T2</th>
<th>6 months after delivery T3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EDPS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (sd); Median</td>
<td>7,3636 (±4,20); 7</td>
<td>6,0543 (±3,98); 5</td>
<td>4,8545(±3,31); 4</td>
</tr>
</tbody>
</table>

We analyze specifically if the women who only performed the first assessment, were more depressed than the other. As we can see in Table II.4.12, although the mean value of EDPS is higher on the group that just performed T1 when compared with the others, this difference is not statistical significant (using a t-test).

There are five cases of women defined as cases of depression (EDPS ≥12) at T1 and T2.

4.1.5. Evaluation of minor psychiatric morbidity - GHQ at T1

To evaluate the existence of minor psychiatric symptoms, we used the General Health Questionnaire 12. The questions are scored from 0 to 4, thus obtaining a sum value which can
vary between 0 and 36. A higher score reflects greater disturbance. There are other versions of quotation scale that were described in the previous chapter.

In this study we used the original version and the conventional method, in which the scores of the responses are dichotomized into 0 and 1 (where and 1 = 0 and 2 and 3 = 1), with a maximum score of 12 points. As we can see in Table II.4.6, the mean GHQ in this sample of pregnant women was 1.75 and 24.7% of women had scores higher or equal to 3, the cut-off suggested for the definition of “cases”.

**Table II.4.6.** – Evaluation of minor psychopathology assessed by GHQ at T1 (n=92)

<table>
<thead>
<tr>
<th>GHQ original (0-12)</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of cases – GHQ ≥ 3</td>
<td>24.7%</td>
</tr>
<tr>
<td>Mean (sd), median; min-max</td>
<td>1.752 (±2.31); 1; 0-10</td>
</tr>
</tbody>
</table>

### 4.1.6. Assessment of sense of coherence - SOC at T1, T2, T3

To evaluate sense of coherence, Orientation to life questionnaire was applied in the three moments of evaluation. At T1 4 women didn’t fill SOC, neither 7 at T2 and 7 at T3. As we can see at Table II.4.7, the values obtained for the average and median of SOC in the three assessments are low to moderate compared with the existing values on literature (Langius et al 1996), though there is an increase in the average and median of the SOC across the study. The values are lower than those obtained in other studies, being the average value of SOC in pregnant women 67 (± 12) in early pregnancy, 68 (± 11) at the end of pregnancy and 67 (± 10) at 8 weeks postpartum (Sjostrom et al 2004).

**Table II.4.7** – Evaluation of sense of coherence at T1, T2 and T3

<table>
<thead>
<tr>
<th>SOC Total score (13 a 91)</th>
<th>Early pregnancy T1 (n 88)</th>
<th>End of pregnancy T2 (n 60)</th>
<th>6 months after delivery T3 (n 58)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (sd); median (min-max)</td>
<td>59.66 (± 10.46); 60 (33-90)</td>
<td>63.85 (±9.42); 63 (40-84)</td>
<td>64.69 (±9.46); 66.5 (41-80)</td>
</tr>
</tbody>
</table>
In order to understand if this increase in the level of SOC along pregnancy was due to the fact that women with lower levels had left the study, creating a bias, we analyzed the evolution of SOC in the 48 pregnant women who participated in all the three assessments. As it can be seen in Table II.4.8, we observe the same phenomenon, the improvement of the values of SOC, over the three assessments.

**Table II.4.8 – Evaluation of sense of coherence in women that completed T1, T2 and T3 (n=48)**

<table>
<thead>
<tr>
<th></th>
<th>Early pregnancy T1 (n 48)</th>
<th>End of pregnancy T2 (n 48)</th>
<th>6 months after delivery T3 (n 48)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SOC Total score (13 a 91)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (sd); median (min-max)</td>
<td>60,86 (±0,03); 60,50 (43 -78)</td>
<td>66,31 (±7,36); 66,50 (52 -84)</td>
<td>66,17 (±7,69); 66,50 (49 -79)</td>
</tr>
</tbody>
</table>

4.1.7. Maternal-fetal attachment - MFAS at T2

In order to evaluate the maternal-fetal attachment in late pregnancy, the MFAS was applied. The total score on this scale may range from 0 to 120, The results obtained are in Table II.4.9, where we can see that the scores ranged between 81 and 111, with an average of 98,015.

**Table II.4.9 - Evaluation of maternal-fetal attachment assessed by MFAS at T2 (n=67)**

<table>
<thead>
<tr>
<th>MFAS</th>
<th>End of pregnancy T2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (sd); median (min-max)</td>
<td>98,015 (±8,098); 100 (81 -111)</td>
</tr>
</tbody>
</table>

4.1.8. Emotional availability assessed 6 months after delivery – EAS at T3

Interaction between mother and baby was assessed, according to what is described in the methodology chapter. We used the Emotional Availability Scales 4th edition, an adapted version for children aged 0 to 5 years of age, in its various subscales, namely sensitivity, structuring, non-hostility and non-intrusiveness related to mother, and child responsiveness and involvement. Each dimension is coded on a 7-point scale in which 7 represents a high level, scores of 6 and 5 reflected moderate levels of various dimensions, and scores lower than
5 clearly reflect inconsistency or insufficient or disturbed relationship. For statistical reasons the results of the six dimensions were dichotomized into 0 and 1, as scores greater than or equal to 5 were listed as 1 and less than 5 were listed as 0. So the more positive features in the mother-baby are quoted as 1. To facilitate reading the table, a high level of non-intrusiveness is reported also as low intrusiveness, and high non-hostility is described as low hostility.

From 65 videotaped interactions it was only possible to code 61, since in four of the videos, the material was insufficient or because the films were too short due to the unavailability of the mothers, or because the baby was almost always asleep.

At the following graphics (Graphic II.4.1–II.4.6) we can observe the distribution of the results obtained in the different dimensions of EAS (after delivery T3).

---

Graphic II.4.1 – Adult sensitivity (EAS)  
Graphic II.4.2 – Adult structuring (EAS)

Graphic II.4.3 – Adult non-intrusiveness (EAS)  
Graphic II.4.4 – Adult non-hostility (EAS)
As we can see in Table II.4.10, 55.7% of the mothers had a low sensitivity, 44.3% a low structuring, 55.7% are very intrusive and 14.7% demonstrate hostility in the relationship with the baby. Regarding infants, 50.8% had low responsiveness to their mothers, and 68.9% had low ability to stimulate the involvement of mothers. These values indicate the existence of difficulties in mother-baby interaction.

Table II.4.10 – Emotional Availability Scales (dichotomized) at T3 (n-61)

<table>
<thead>
<tr>
<th>Emotional Availability Scales</th>
<th>Results</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Mother’s sensitivity ≥ 5</td>
<td>1</td>
<td>27</td>
</tr>
<tr>
<td>Low mother’s sensitivity &lt; 5</td>
<td>0</td>
<td>34</td>
</tr>
<tr>
<td>High mother’s structuring ≥ 5</td>
<td>1</td>
<td>34</td>
</tr>
<tr>
<td>Low mother’s structuring &lt; 5</td>
<td>0</td>
<td>27</td>
</tr>
<tr>
<td>High mother’s non-intrusiveness ≥ 5 (low intrusiveness)</td>
<td>1</td>
<td>27</td>
</tr>
<tr>
<td>Low mother non-intrusiveness &lt; 5 (high intrusiveness)</td>
<td>0</td>
<td>34</td>
</tr>
<tr>
<td>High mother non-hostility ≥ 5 (low hostility)</td>
<td>1</td>
<td>52</td>
</tr>
<tr>
<td>Low mother non-hostility &lt; 5 (high hostility)</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>High child responsiveness ≥ 5</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>Low child responsiveness &lt; 5</td>
<td>0</td>
<td>31</td>
</tr>
<tr>
<td>High child involvement ≥ 5</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>Low child involvement &lt; 5</td>
<td>0</td>
<td>42</td>
</tr>
</tbody>
</table>

As we can see in Table II.4.11, the values in these ranges are low, as the average of sensitivity was 4.08 (± 1.144) of structuring 3.97 (± 1.110); of non-intrusiveness 3.97 (± 1.110); of non-hostility 5.41 (± 1.202); in child responsiveness 4.16 (± 1.241) and in child involvement 3.69 (± 1.323).
Table II.4.11 – Emotional Availability Scales at T3 (n=61)

<table>
<thead>
<tr>
<th></th>
<th>Sensitivity</th>
<th>Structuring</th>
<th>Non-intrusiveness</th>
<th>Non-hostility</th>
<th>Child Responsiveness</th>
<th>Child Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (sd)</td>
<td>4.08 (+1.144)</td>
<td>4.18 (+1103)</td>
<td>3.97 (+1,110)</td>
<td>5.41 (+ 1,202)</td>
<td>4.16 (+1,241)</td>
<td>3.69 (+1,323)</td>
</tr>
<tr>
<td>Med(min-max)</td>
<td>4 (1-6)</td>
<td>5 (2-6)</td>
<td>4 (1-6)</td>
<td>5 (2-7)</td>
<td>4 (1-6)</td>
<td>3 (1-7)</td>
</tr>
</tbody>
</table>

4.1.9. Characterization of the women who dropped out after the first assessment

Of the initial sample of 92 pregnant women included, we can observe that 18 only completed the first assessment, missing T2 and T3. In order to understand if these 18 women had a higher risk than those who completed the other evaluations, introducing a bias in the results analysis, we compared the data related with them, with the data from the other women. This analysis included only 15 of the 18 pregnant, since in three women the reason for not completing the other assessments, was fetal death, what we consider a complete different problem. The results are listed in table II.4.12.

Table II.4.12 - Women that just completed T1 /other women

<table>
<thead>
<tr>
<th></th>
<th>Women who just completed T1 (n=15)</th>
<th>Other women (n=74)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>25 (+4.07); 25; (19-31)</td>
<td>28.5 (+6.01); 29; (18-46)</td>
</tr>
<tr>
<td>Marital status(0,1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 single, divorced</td>
<td>4 (26.7%)</td>
<td>18 (24.32%)</td>
</tr>
<tr>
<td>1 married, cohabitant</td>
<td>11 (73.3%)</td>
<td>56 (75.68%)</td>
</tr>
<tr>
<td>Scholarity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 ≤ 9 years</td>
<td>11 (73.3%)</td>
<td>42 (56.8%)</td>
</tr>
<tr>
<td>1 &gt; 9 years</td>
<td>4 (26.7%)</td>
<td>32 (43.2%)</td>
</tr>
<tr>
<td>Nationality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portugal</td>
<td>8 (53.3%)</td>
<td>47 (63.5%)</td>
</tr>
<tr>
<td>Cabo Verde</td>
<td>4 (26.7%)</td>
<td>12 (16.2%)</td>
</tr>
<tr>
<td>Brasil</td>
<td>3 (20%)</td>
<td>4 (5.4%)</td>
</tr>
<tr>
<td>Angola</td>
<td>0</td>
<td>2 (2.7%)</td>
</tr>
<tr>
<td>Guiné</td>
<td>0</td>
<td>3 (4.1%)</td>
</tr>
<tr>
<td>Moçambique</td>
<td>0</td>
<td>1 (1.35%)</td>
</tr>
<tr>
<td>S. Tomé</td>
<td>0</td>
<td>4 (5.4%)</td>
</tr>
</tbody>
</table>
### Immigrant

<table>
<thead>
<tr>
<th></th>
<th>No (60%)</th>
<th>First generation (40%)</th>
<th>Second generation (0%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDPS &lt;12 mean</td>
<td>7,4 ±6.46</td>
<td>13 (86.7%)</td>
<td>2 (13.3%)</td>
</tr>
<tr>
<td>EDPS ≥12 mean</td>
<td>1 (1-25)</td>
<td>59 (79.7%)</td>
<td>15 (20.3%)</td>
</tr>
<tr>
<td>GHQ mean</td>
<td>2,2 ±3.00</td>
<td>1,67 ±12.18</td>
<td>1 (0-9)</td>
</tr>
</tbody>
</table>

### Sense of coherence

<table>
<thead>
<tr>
<th></th>
<th>Mean (SD); Median (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Factors</td>
<td>1 ±1.19; 1 (0-3)</td>
</tr>
<tr>
<td>Maternal Factors</td>
<td>1,40 ±1.84; 1 (0-5)</td>
</tr>
<tr>
<td>Substance Abuse</td>
<td>0,13 ±0,516; 0 (0-2)</td>
</tr>
<tr>
<td>Family Violence</td>
<td>0,27 ±0,594; 0 (0-2)</td>
</tr>
<tr>
<td>Total ALPHA</td>
<td>3,2 ±3,56; 2 (0-12)</td>
</tr>
</tbody>
</table>

We can conclude that the two groups are very similar in their socio-demographic, level of risk and clinical dimensions, excepting on mother's age. Pregnant women who only held the first evaluation, had a lower average age than the others (25 ± 4.07/28.5 ± 6.01), and this difference was statistically significant (applied a test of T student - p 0.03). None of the other variables showed significant differences between the two groups using T-test. We can see these results in graphic II.4.7.
PART II
ORIGINAL RESEARCH

CHAPTER 4
RESULTS

4.2. CORRELATION ANALYSIS AND UNIVARIATE LOGISTIC REGRESSION
4.2. CORRELATION ANALYSIS

To facilitate the comprehension of results we’ll present them after each research question that will be represented in the theoretical model.

4.2.A - In pregnant women, which variables are associated with an increased psychosocial risk, as measured by ALPHA at the beginning of pregnancy?

We performed a correlation analysis between socio-demographic data of pregnant women and psychosocial risk evaluated by ALPHA, and secondly between depression evaluated with EPDS, minor psychiatric symptoms assessed by GHQ, and sense of coherence measured by SOC, with the various dimensions of psychosocial risk assessed by ALPHA.

4.2.A.1 - Are the socio-demographic characteristics (age, marital status, immigration status, education) associated with an increased or lower psychosocial risk, as measured by ALPHA? Could we identify among pregnant women specific groups at high risk of psychosocial problems?

We used each ALPHA question corresponding to a different psychosocial risk factor, the subtotals defined as the sum of group scores (Family risk factors - ALPHA F; Maternal risk...
As we can see in table II.4.13, scholarly, father’s age, marital situation, nationality and immigrant situation are correlated with psychosocial risk. Mother’s age has no significant correlation with psychosocial risk. The number of years a women has studied is a protective factor, as it is negatively correlated with lack of social support (F1), the existence of a problematic couple’s relationship (F3), the absence of prenatal care (M1), risk feelings towards pregnancy at 20 weeks of pregnancy (M3), a bad relationship with their parents, and with family risk factors in general (ALPHA F), substance abuse (ALPHA SA) and with total risk score of ALPHa. The increase of father’s age is also a protective factor as it is correlated with a less problematic couple’s relationship (F3), and lower risk of a mother’s psychiatric history (M6), and also with less maternal risk factors (ALPHA M), less substance abuse (ALPHA SA) and a lower total ALPHA. Finally being married or living with a partner and a good self-esteem are also protective factors, decreasing family risk subtotal (ALPHA F) and total ALPHA.
On the contrary being non-Portuguese or immigrant is a risk factor for the existence of more life events (F2), and familiar risk (ALPHA F).

4.2.A.2 - Do mothers with previous mental health problems, namely depression, minor psychopathology or low sense of coherence have a higher level of global psychosocial risk in the beginning of pregnancy?

As was described earlier in chapter 4 Part I, mothers with mental illness are more exposed to multiple psychosocial risk factors, such as unplanned pregnancy, poor antenatal care, low socioeconomic status, less education and fewer social support that will increase parenting difficulties (Miller, 1997; Miller & Finnerty, 1996). This increased association with risk, put them already in the beginning of pregnancy, in a more vulnerable situation. According this theoretical background, we decided to evaluate the correlation between mental health dimensions measured in the beginning of pregnancy, namely depression, minor psychopathology and low sense of coherence with psychosocial risk.

Depression in the beginning of pregnancy and ALPHA

As explained earlier, ALPHA was built from the combination of several risk factors that have proven to have a strong association with postpartum depression, child or women abuse, couple dysfunction and physical illness. Many authors agree on the fact that depression during pregnancy and after birth have the same determinants (Beck, 1996; O’Hara & Swain, 1996; Wilson et al, 1996).

The questions that were introduced by the authors in the instrument for having a proved association with postpartum depression (marked in table 17 with #) were F1 (risk of lack of social support), F2 (stressful life-events), F3 (couple relationship), Family Factors subtotal, M6 (psychiatric history), M7 (history of depression), and VF2 (current or past women).

In this study, almost all the risk factors that the authors of ALPHA assumed to be related with later postpartum depression, are also correlated with an existing depression at the beginning of pregnancy.

As we can see in table II.4.4 the lack of social support (F1), the existence of life events (F2), problems in the marital relationship (F3), history of psychiatric/emotional problems (M6), history of depression (M7), current or past woman abuse (VF2) and ALPHA Family demonstrated all to be correlated with higher levels of depression in the beginning of pregnancy using EDPS in the continuous version.

A problematic relationship with parents (M4), low self-esteem (M5), maternal factors subtotal (ALPHA M), family violence subtotal (ALPHA FV) and total ALPHA, that were not indicated by the authors as variables associated with a higher risk of postpartum depression, have also
demonstrated to be positively correlated with depression already in the beginning of pregnancy.
We can conclude that women who are depressed in the beginning of pregnancy have a higher psychosocial risk as measured by ALPHA.

**Table II.4.14 - Correlation analysis between depression in the beginning of pregnancy and psychosocial risk at T1 (n = 92)**

<table>
<thead>
<tr>
<th></th>
<th>EDPS continuous coefficient (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1 Lack of social support (0,1,2)#</td>
<td>0.395 (0.000)</td>
</tr>
<tr>
<td>F2 Stressful life-events (0,1,2)#</td>
<td>0.393 (0.000)</td>
</tr>
<tr>
<td>F3 Couple’s relationship of risk(0,1,2)#</td>
<td>0.388 (0.000)</td>
</tr>
<tr>
<td>M4 Relationship with parents (0,1,2)</td>
<td>0.238 (0.023)</td>
</tr>
<tr>
<td>M5 Self-esteem (0,1,2)</td>
<td>0.338 (0.001)</td>
</tr>
<tr>
<td>M6 History of psychiatric/emotional problems (0,1,2)#</td>
<td>0.268 (0.010)</td>
</tr>
<tr>
<td>M7 Depression in pregnancy (0,1,2)#</td>
<td>0.491 (0.000)</td>
</tr>
<tr>
<td>VF 2 Current or past woman abuse (0,1,2)#</td>
<td>0.300 (0.004)</td>
</tr>
<tr>
<td>Family Factors - ALPHA F (0,1,2)#</td>
<td>0.533 (0.000)</td>
</tr>
<tr>
<td>Maternal Factors - ALPHA M (0,1,2)</td>
<td>0.501 (0.000)</td>
</tr>
<tr>
<td>Family violence – ALPHA FV (0,1,2)</td>
<td>0.213 (0.042)</td>
</tr>
<tr>
<td>TOTAL ALPHA (0,1,2)</td>
<td>0.557 (0.000)</td>
</tr>
</tbody>
</table>

Minor psychopathology in the beginning of pregnancy and ALPHA

As we can see in Table II.4.15, lack of social support (F1), stressful life-events (F2), problematic couple’s relationship (F3), the existence of negative feelings about the pregnancy at 20 weeks (M3), a problematic relationship with their parents (M4), a low self-esteem (M5), the existence of psychiatric history (M6), history of depression during pregnancy (M7) and current or past women abuse (VF2) are associated with higher rates of GHQ, i.e. with a higher level of minor psychopathology. These results have demonstrated to be of statistical significance. Family factors (F ALPHA), maternal factors (ALPHA M), and family violence (ALPHA FV) have also a positive correlation with GHQ. The increase in the total number of psychosocial risk factors detected by Total ALPHA is also associated with higher scores on the GHQ. So, we can conclude that the existence of minor psychopathology is strongly correlated with a higher psychosocial risk in pregnancy.
Table II.4.15 - Correlation analysis between minor psychopathology assessed by GHQ and psychosocial risk at T1 (n=92)

<table>
<thead>
<tr>
<th>Minor psychopathology - GHQ coefficient (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1 Social support (0,1,2)</td>
</tr>
<tr>
<td>F2 Stressful life-events (0,1,2)</td>
</tr>
<tr>
<td>F3 Couple’s relationship of risk (0,1,2)</td>
</tr>
<tr>
<td>M3 Feelings towards pregnancy after 20 weeks (0,1,2)</td>
</tr>
<tr>
<td>M4 Relationship with parents (0,1,2)</td>
</tr>
<tr>
<td>M5 Self-esteem (0,1,2)</td>
</tr>
<tr>
<td>M6 History of psychiatric/emotional problems (0,1,2)</td>
</tr>
<tr>
<td>M7 Depression in pregnancy (0,1,2)</td>
</tr>
<tr>
<td>VF2 Current or past women abuse (0,1,2)</td>
</tr>
<tr>
<td>Family factors - ALPHA F (0,1,2)</td>
</tr>
<tr>
<td>Maternal factors - ALPHA M (0,1,2)</td>
</tr>
<tr>
<td>Family violence – ALPHA VF (0,1,2)</td>
</tr>
<tr>
<td>TOTAL ALPHA (0,1,2)</td>
</tr>
</tbody>
</table>

Sense of coherence in the beginning of pregnancy and ALPHA

We used again a Pearson correlation to study these relationships, and the results that meet statistical significance are reflected in Table II.4.16.

As is shown, there is a statistically significant negative correlation between sense of coherence and various dimensions of risk, including lack of social support (F1), stressful life events (F2), problematic couple’s relationship of risk (F3), low self-esteem (M5), psychiatric history (M6), previous history of depression (M7), current or past woman abuse (VF2), child discipline (VF4). Sense of coherence is also negatively correlated with the family factors subtotal (ALPHA F), maternal factors subtotal (ALPHA M) and with the family violence subtotal (ALPHA VF) as shown in Table 19. To conclude, a low sense of coherence is associated with more risk in general detected by total ALPHA, or it might suggest that a high sense of coherence functions as a protective factor for psychosocial risk.
**Table 4.16** - Correlation analysis between sense of coherence and psychosocial risk at T1 (n=88)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Sense of coherence coefficient (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1  Social support (0,1,2)</td>
<td>-0.273 (0.010)</td>
</tr>
<tr>
<td>F2  Stressful life-events (0,1,2)</td>
<td>-0.422 (0.000)</td>
</tr>
<tr>
<td>F3  Couple’s relationship (0,1,2)</td>
<td>-0.242 (0.023)</td>
</tr>
<tr>
<td>M5  Self-esteem (0,1,2)</td>
<td>-0.242 (0.023)</td>
</tr>
<tr>
<td>M6  History of psychiatric/emotional problems (0,1,2)</td>
<td>0.3698 (0.000)</td>
</tr>
<tr>
<td>M7  Depression in pregnancy (0,1,2)</td>
<td>-0.425 (0.000)</td>
</tr>
<tr>
<td>VF2  Current or past woman abuse (0,1,2)</td>
<td>-0.259 (0.015)</td>
</tr>
<tr>
<td>VF4  Child discipline (0,1,2)</td>
<td>-0.234 (0.028)</td>
</tr>
<tr>
<td>Family factors ALPHA F (0,1,2)</td>
<td>-0.418 (0.000)</td>
</tr>
<tr>
<td>Maternal factors ALPHA M (0,1,2)</td>
<td>-0.514 (0.000)</td>
</tr>
<tr>
<td>Family Violence ALPHA FV (0,1,2)</td>
<td>-0.304 (0.004)</td>
</tr>
<tr>
<td>TOTAL ALPHA (0,1,2)</td>
<td>-0.2818 (0.0321)</td>
</tr>
</tbody>
</table>
4.2.B - Which pregnant women are more vulnerable to depression, minor psychopathology or lower sense of coherence?

Figure 11.4.3 – Research questions B1, B2, B3, B4 and B5

4.2.B1, B2 and B3 - Which socio-demographic characteristics are associated with higher rates of minor psychopathology in the beginning of pregnancy and with higher rates of depression and low sense of coherence in the beginning, in the end of pregnancy, and 6 months after birth?

Minor psychopathology

We concluded (table II.4.17) that being married or having a marital relationship is associated with a lower level of psychopathology in the beginning of pregnancy. Being immigrant or non-Portuguese is correlated with higher psychopathology.
Table II.4.17 - Correlation analysis between socio-demographic variables and minor psychopathology at T1

<table>
<thead>
<tr>
<th></th>
<th>Marital status (0,1) coefficient (p)</th>
<th>Migrant situation (0,1) coefficient (p)</th>
<th>Nationality (0,1) coefficient (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHQ</td>
<td>-0.217 (0.041)</td>
<td>0.338 (0.001)</td>
<td>0.365 (0.001)</td>
</tr>
</tbody>
</table>

Depression

We analyzed the correlation between socio-demographic variables in pregnant women and depression in early and end of pregnancy, evaluated by EDPS. We concluded (table II.4.18) that marital status, the condition of immigrant and nationality influences depression, as being single or divorced increases the level of depression, and being migrant or non Portuguese is associated with a higher level of depression in the beginning of pregnancy. In the end of pregnancy, depression is correlated with marital status, as women who are married or living in a marital relationship, have lower levels of depression, as it happens in the beginning of pregnancy. Immigrant situation or nationality, are not significantly statistical correlated with depression in the end of pregnancy. Six months after birth, neither marital status, immigrant situation or nationality, are correlated with depression. We didn’t found significant associations with other socio-demographic variables, such as mother’s or father’s age or years of education.

Table II.4.18 - Correlation analysis between socio-demographic variables and depression at T1, T2 and T3

<table>
<thead>
<tr>
<th></th>
<th>Marital status (0,1) coefficient (p)</th>
<th>Migrant situation (0,1) coefficient (p)</th>
<th>Nationality (0,1) coefficient (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDPS continuous T1</td>
<td>-0.253 (0.015)</td>
<td>0.322 (0.002)</td>
<td>0.304 (0.003)</td>
</tr>
<tr>
<td>EDPS continuous T2</td>
<td>-0.240 (0.05)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDPS continuous T3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

We also conducted a univariate logistic regression analysis between socio-demographic variables and depression at T1, T2 and T3, assessed by the EDPS. None of the results obtained at T2 and T3 were statistically significant. We present the results at T1 at table II.4.19.
Table II.4.19 - Univariate logistic regression between socio-demographic variables and depression assessed by EDPS version (O, 1) at T1 (n=92)

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variable</th>
<th>Categories</th>
<th>p value</th>
<th>OR</th>
<th>IC OR (95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression (0,1)</td>
<td>Nationality</td>
<td>Cabo Verde</td>
<td>0,044</td>
<td>4,167</td>
<td>1,037</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Brasil</td>
<td>0,664</td>
<td>1,667</td>
<td>0,166</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Angola</td>
<td>0,022</td>
<td>20,000</td>
<td>1,530</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Guiné</td>
<td>0,220</td>
<td>5,000</td>
<td>0,382</td>
</tr>
<tr>
<td></td>
<td></td>
<td>São Tomé</td>
<td>0,037</td>
<td>10,000</td>
<td>1,148</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Portugal</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Migrant</td>
<td>Yes - first generation</td>
<td>0,012</td>
<td>4,545</td>
<td>1,390</td>
<td>14,865</td>
</tr>
<tr>
<td></td>
<td>Yes - second generation</td>
<td>0,008</td>
<td>15,000</td>
<td>2,007</td>
<td>112,124</td>
</tr>
<tr>
<td></td>
<td>Non immigrant</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Referring only to situations with a statistically significant association, we can verify that pregnant women from Cabo Verde, have a four times higher risk (OR=4.167) of having a higher level of depression (EDPS ≥12) compared with the Portuguese pregnant women (category reference); women from Angola have a risk of depression twenty times higher (OR=20) and those who are from S. Tomé have ten times a higher risk (OR=20) of having higher levels of depression (EDPS ≥12) in comparison to Portuguese pregnant women. We need to take into account that these results are based on very low numbers of women in some of these immigrant nationalities.

Mothers from the first immigrant generation have a 4.5 times greater risk of having depression (EDPS≥12) than non-immigrants, and the second immigrant generation shows a 15 times higher risk for depression than non-immigrants, who constitute the reference category.

Sense of coherence

The correlation analysis between socio-demographic variables and sense of coherence in early pregnancy shows that father’s age is positively correlated with the mother’s sense of coherence (table II.4.20). There is also a significant positive correlation between marital status and sense of coherence. Pregnant women who are married or living in a marital relationship have a greater sense of coherence in the beginning of pregnancy, but this correlation is not statistical significant in the end of pregnancy and 6 months after birth. The other demographic variables did not show a statistically significant correlation, namely education level, mother’s age, migrant situation or nationality.
**Table II.4.20** Correlation analysis between marital status and sense of coherence at T1

<table>
<thead>
<tr>
<th></th>
<th>Father's age coefficient (p)</th>
<th>Marital situation (0,1) coefficient (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC at T1</td>
<td>0,2494(0,0191)</td>
<td>0,278 (0,009)</td>
</tr>
</tbody>
</table>

4.2.B4 and B5 Which psychosocial risk factors assessed by ALPHA, are associated with higher rates of depression and with lower rates of sense of coherence in the end of pregnancy and 6 months after birth?

**Depression**

It was already explained that the authors of ALPHA proved that a higher psychosocial risk evaluated by ALPHA was later associated with negative outcomes as postpartum depression, child abuse, women abuse, couple dysfunction and physical illness. The items associated with postpartum depression have been identified with # in table 11.4.21.

We have already demonstrated that depressed women in the beginning of pregnancy have a higher global psychosocial risk as measured by ALPHA. Now, we have analysed the correlation of psychosocial risk in the beginning of pregnancy with a higher rate of depression in the end of pregnancy and six months after delivery.

As we can observe in table II.4.21, stressful life-events (F2), non secure feelings about the pregnancy at 20 weeks (M3), history of psychiatric/emotional problems (M6), existence of previous depression (M7), the presence of maternal risk factors in general (ALPHA M), the presence of family risk factors (ALPHA F) and substance abuse (ALPHA SA), all measured at T1 are positively predicting the level of depression in late pregnancy. The overall psychosocial risk assessed by ALPHA total also has a positive correlation with the EDPS in the end of pregnancy.

In the assessment 6 months after birth, only history of psychiatric/emotional problems (M6), depression during pregnancy (M7), maternal risk factors (ALPHA M), substance abuse (ALPHA SA) and Total ALPHA predicted a higher level of depression.

To facilitate the interpretation in table II.4.21 we introduced the correlations of ALPHA with EDPS evaluated at the three moments.
Table II.4.21 – Correlation analysis between psychosocial risk factors evaluated at T1 and depression at T1, T2 and T3

<table>
<thead>
<tr>
<th></th>
<th>EDPS continuous T1 coefficient (p)</th>
<th>EDPS continuous T2 coefficient (p)</th>
<th>EDPS continuous T3 coefficient (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1 Lack of social support (0,1,2)#</td>
<td>0,395 (0,000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F2 Stressful life-events (0,1,2)#</td>
<td>0,393 (0,000)</td>
<td>0,249 (0,046)</td>
<td></td>
</tr>
<tr>
<td>F3 Couple’s relationship of risk (0,1,2)#</td>
<td>0,388 (0,000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M3 Feelings 20 weeks (0,1,2)</td>
<td></td>
<td>0,295 (0,017)</td>
<td></td>
</tr>
<tr>
<td>M4 Relationship with parents (0,1,2)</td>
<td>0,238 (0,023)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M5 Self-esteem (0,1,2)</td>
<td>0,338 (0,001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M6 History of psychiatric problems (0,1,2)#</td>
<td>0,268 (0,010)</td>
<td>0,467 (0,000)</td>
<td>0,344 (0,006)</td>
</tr>
<tr>
<td>M7 Depression in pregnancy (0,1,2)#</td>
<td>0,491 (0,000)</td>
<td>0,374 (0,002)</td>
<td>0,420 (0,001)</td>
</tr>
<tr>
<td>VF2 Current or past woman abuse (0,1,2)#</td>
<td>0,300 (0,004)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Factors - ALPHA F (0,1,2)#</td>
<td>0,533 (0,000)</td>
<td>0,273 (0,028)</td>
<td></td>
</tr>
<tr>
<td>Maternal Factors - ALPHA M (0,1,2)</td>
<td>0,501 (0,000)</td>
<td>0,405 (0,001)</td>
<td>0,322 (0,010)</td>
</tr>
<tr>
<td>Substance abuse – ALPHA SA (0,1,2)</td>
<td></td>
<td>0,277 (0,026)</td>
<td>0,241 (0,05)</td>
</tr>
<tr>
<td>Family violence – ALPHA FV (0,1,2)</td>
<td>0,213 (0,042)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL ALPHA (0,1,2)</td>
<td>0,557 (0,000)</td>
<td>0,407 (0,001)</td>
<td>0,265 (0,036)</td>
</tr>
</tbody>
</table>

Sense of coherence

We have already demonstrated that a low sense of coherence in the beginning of pregnancy is associated with more risk in general detected by total ALPHA, suggesting that a high sense of coherence functions as a protective factor for psychosocial risk.

We have analyzed if this correlation between a higher psychosocial risk in women and a low sense of coherence continues during pregnancy and after birth.

As we can see in table II.4.22, we observed also a negative correlation of the existence of several risk factors like life-events (F2), history of psychiatric/emotional problems (M6), history of depression (M7), women past experience of abuse (VF1), women child discipline (VF4) family and also with the maternal factors and family violence subtotals (ALPHA F, ALPHA M, ALPHA FV), and total ALPHA with sense of coherence in the end of pregnancy.

Finally, the history of psychiatric/emotional problems (M6), history of depression (M7) and total ALPHA are negatively correlated with SOC six months after birth.
So we can conclude that women with higher psychosocial risk in several dimensions of ALPHA and according to total ALPHA are also those who will maintain a lower sense of coherence during pregnancy and six months after birth. In table II.4.22 we introduced the correlations with SOC at the three moments of evaluation.

### Table II.4.22 – Correlation analysis between psychosocial risk factors at T1 and sense of coherence at T1, T2 and T3

<table>
<thead>
<tr>
<th>Category</th>
<th>SOC continuous T1 coefficient (p)</th>
<th>SOC continuous T2 coefficient (p)</th>
<th>SOC continuous T3 coefficient (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1 Lack of social support (0,1,2)</td>
<td>-0.273 (0.010)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F2 Stressful life events (0,1,2)</td>
<td>0.422 (0.000)</td>
<td>-0.318 (0.013)</td>
<td></td>
</tr>
<tr>
<td>F3 Couple’s relationship of risk (0,1,2)</td>
<td>-0.242 (0.023)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M5 Self-esteem (0,1,2)</td>
<td>-0.242 (0.023)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M6 History of psychiatric problems (0,1,2)</td>
<td>-0.398 (0.000)</td>
<td>-0.346 (0.007)</td>
<td>-0.265 (0.044)</td>
</tr>
<tr>
<td>M7 Depression in pregnancy (0,1,2)</td>
<td>-0.425 (0.000)</td>
<td>-0.376 (0.003)</td>
<td>-0.286 (0.029)</td>
</tr>
<tr>
<td>VF1 Women experience of abuse (0,1,2)</td>
<td></td>
<td>-0.263 (0.042)</td>
<td></td>
</tr>
<tr>
<td>VF2 Current or past woman abuse (0,1,2)</td>
<td>-0.259 (0.015)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VF4 Child discipline (0,1,2)</td>
<td>-0.234 (0.028)</td>
<td>-0.346 (0.007)</td>
<td></td>
</tr>
<tr>
<td>Family Factors - ALPHA F (0,1,2)</td>
<td>-0.418 (0.000)</td>
<td>-0.311 (0.015)</td>
<td></td>
</tr>
<tr>
<td>Maternal Factors - ALPHA M (0,1,2)</td>
<td>-0.514 (0.000)</td>
<td>-0.441 (0.000)</td>
<td></td>
</tr>
<tr>
<td>Family violence – ALPHA FV (0,1,2)</td>
<td>-0.304 (0.004)</td>
<td>-0.365 (0.004)</td>
<td></td>
</tr>
<tr>
<td>TOTAL ALPHA (0,1,2)</td>
<td>-0.2818 (0.0321)</td>
<td>-0.527 (0.000)</td>
<td>-0.282 (0.032)</td>
</tr>
</tbody>
</table>
4.2.C - What are the determinants of maternal-fetal attachment at the end of pregnancy?
- Which populations of pregnant women are associated with poor maternal-fetal attachment at the end of pregnancy?
- What are their risk and protective factors?

Figure II.4.4 – Research Hypothesis C1, C2, C3 and C4

4.2.C1 - Which populations of pregnant women defined by socio-demographic characteristics will have later a poorer maternal-fetal attachment?

As we can see at table II.4.23, mother’s age and father’s age as well, are positively correlated with MFA, as the increase of mother’s and father’s age increases maternal-fetal attachment. The other demographic variables showed no statistically significant relationship, namely marital situation, nationality, migrant situation or years of education.

Table II.4.23 – Correlation analysis between socio-demographic data and maternal-fetal attachment

<table>
<thead>
<tr>
<th>Maternal-fetal attachment (continuous version)</th>
<th>Mother’s age coefficient(p)</th>
<th>Father’s age coefficient(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.3179(0.0099)</td>
<td>0.2616(0.0353)</td>
</tr>
</tbody>
</table>
4.2.C2 and C3 - Are minor psychopathology, depression and low sense of coherence in first and second assessment associated with poor maternal-fetal attachment?

The correlations of GHQ and SOC with MFAS did not show significant results. We studied the correlation of depression (as a continuous variable) assessed at the beginning and at the end of pregnancy with maternal-fetal attachment, and we found no statistically significant results. We repeated this analysis using EDPS dichotomized, and found a negative correlation only at T1 presented at table II.4.24. According these results, women with an EDPS higher than 12 in the beginning of pregnancy, have a lower score at MFAS in the end of pregnancy.

<table>
<thead>
<tr>
<th>Maternal-fetal attachment (continuous version) coefficient (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Depression - EDPS (0,1) at T1</strong></td>
</tr>
<tr>
<td>0 &lt; 12; 1≥12</td>
</tr>
</tbody>
</table>

4.2.C4 – Which psychosocial risk factors as measured by ALPHA are associated with a later poor maternal-fetal attachment?

Analysis of correlation between the various dimensions of the ALPHA and maternal foetal attachment suggests that current or past women abuse (VF 2) is associated with higher maternal-fetal attachment (table II.4.25). Other risk factors evaluated by ALPHA, ALPHA subgroups or ALPHA total did not show any statistically significant relationship with the maternal fetal attachment.

<table>
<thead>
<tr>
<th>Maternal-fetal attachment (continuous version) coefficient (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VF 2 current or past women abuse (0,1,2)</strong></td>
</tr>
<tr>
<td>0.248 (0.046)</td>
</tr>
</tbody>
</table>
4.2.D – What are the determinants of postnatal mother-child interaction, more specifically mother-baby emotional availability?

- Which populations of pregnant women are associated with poor mother-baby emotional availability?
- What are their risk and protective factors?

Figure II.4.5. – Research Questions D1, D2, D3, D4 and D5

4.2.D1-Which socio-demographic populations are associated with more difficulties in mother-baby emotional availability?

We analyzed the correlations between socio-demographic variables and the six dimensions of emotional availability. The statistically significant results are shown in Table II.4.26. We can conclude that marital status and mother’s and father’s age (continuous) are not correlated with the dimensions of emotional availability. Being immigrant diminishes child responsiveness. Mother’s level of education, is positively associated with a higher sensitivity of the mother and a higher responsiveness of the child.
Table II.4.26 - Correlation analysis between socio-demographic variables at T1 and emotional availability at T3 (n = 61)

<table>
<thead>
<tr>
<th>Scholarity coefficient (p)</th>
<th>Immigrant status (0,1) coefficient (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity (1-7)</td>
<td>0.2542 (0.0481)</td>
</tr>
<tr>
<td>Child responsiveness (1-7)</td>
<td>0.3430 (0.0066) -0.271 (0.035)</td>
</tr>
</tbody>
</table>

We used a univariate logistic regression to study the relationship between socio-demographic variables assessed in early pregnancy and the dichotomized dimensions of emotional availability in T3. The statistically significant results are on Table II.4.27.

As we can observe being a first generation immigrant increases by 2.77 times the possibility a being non intrusive, i.e. reduces intrusiveness. Regarding baby’s father age, each additional year of the father increases in 0.7% the possibility that mothers have a greater structuring capacity to the baby. Each additional year of the mother increases by 13% the possibility of non intrusive, i.e. reduces her intrusiveness related to the baby. Each more year of education increases in 18% the possibility of a greater child’s responsiveness (up to 5).

Each more point on EDPS in the end of pregnancy or six months after birth decreases the possibility of high non hostility decreases in (1-0.76) 24%, what means that it increases the likelihood of hostile behaviour towards the baby.

Table II.4.27 - Univariate logistic regression between socio-demographic variables and emotional availability at T3 (n = 61)

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variables</th>
<th>Categories</th>
<th>P value</th>
<th>Odds Ratio</th>
<th>IC OR (95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structuring (0,1)</td>
<td>Father’s age</td>
<td></td>
<td>0.099</td>
<td>1.07</td>
<td>0.986884 - 1.167385</td>
</tr>
<tr>
<td>Non-intrusiveness (0,1)</td>
<td>Immigrant status</td>
<td>First generation</td>
<td>0.075</td>
<td>2.77</td>
<td>0.902955 - 8.492826</td>
</tr>
<tr>
<td></td>
<td>Mother’s age</td>
<td></td>
<td>0.017</td>
<td>1.13</td>
<td>1.021813 - 1.242625</td>
</tr>
<tr>
<td></td>
<td>Nationality</td>
<td>non-Portuguese</td>
<td>0.045</td>
<td>2.99</td>
<td></td>
</tr>
<tr>
<td>Non-hostility (0,1)</td>
<td>Depression EDPS at T2</td>
<td></td>
<td>0.008</td>
<td>0.76</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Depression EDPS at T3</td>
<td></td>
<td>0.016</td>
<td>0.76</td>
<td></td>
</tr>
<tr>
<td>Child responsiveness (0,1)</td>
<td>Scholarity</td>
<td></td>
<td>0.029</td>
<td>1.18</td>
<td>0.017 - 1.36952</td>
</tr>
</tbody>
</table>
4.2. D2, D3, D4- Is minor psychopathology in the beginning of pregnancy and depression or low sense of coherence during pregnancy or six months after birth associated with difficulties in mother-baby emotional availability?

**Depression and emotional availability**

We analyzed the correlation between depression assessed in the three time moments and the dimensions of post-natal mother-baby interaction. Table II.4.28 includes only the statistically significant correlations at T2, because there were no statistical significant results at T1 and T3.

**Table II.4.28** - Correlation analysis between depression at T2 and emotional availability at T3

<table>
<thead>
<tr>
<th></th>
<th>Depression at the end of pregnancy T2 (n 58)</th>
<th>EDPS continuous coefficient (p)</th>
<th>EDPS 0 EDPS&lt;12; 1EDPS ≥12 coefficient (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structuring (1 - 7)</td>
<td>-0.3332 (0,0158)</td>
<td>-0.292 (0,036)</td>
<td></td>
</tr>
<tr>
<td>Non-hostility (1 - 7)</td>
<td>-0.2617 (0,0609)</td>
<td>-0.274 (0,050)</td>
<td></td>
</tr>
</tbody>
</table>

At the end of pregnancy EDPS is negatively correlated with mother's structuring; more depressed mothers will have lower capacity to structure the relation with their baby. Repeating these analysis with the values of EDPS dichotomized we obtained a negative correlation not only between depression at the end of pregnancy and structuring but also with non hostility, what means that women with higher levels of depression will be more hostile with their child.

**Minor psychopathology and emotional availability**

We found no statistically significant correlations between GHQ and the various dimensions of emotional availability, neither in version 0,1 nor 1 to 7

**Sense of coherence and emotional availability**

We proceeded to the analysis of correlation between these various dimensions, but we did not found statistically significant correlations between the sense of coherence evaluated in three stages and the various dimensions of emotional availability, neither in version 0,1 nor 1 to 7.
4.2.D5 - Which risk factors as detected by ALPHA are more associated with more difficulties in mother-baby emotional availability?

For this purpose we studied the correlation of Total ALPHA, ALPHA Subgroups and each separate ALPHA risk factor with the various dimensions of emotional availability. We used the continuous version of both scales.

The only significant correlation we have found was a negative correlation between VF2 (current or past women abuse) and child responsiveness, that we present in table II.4.29.

All the other correlations were non-significant.

<table>
<thead>
<tr>
<th>Table II.4.29 - Correlation analysis between psychosocial risk at T1 and emotional availability at T3 (n 61)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VF2</strong></td>
</tr>
<tr>
<td>Child responsiveness (1 - 7)</td>
</tr>
</tbody>
</table>
4.2.E - Is maternal-fetal attachment related with postnatal mother-child interaction, more specifically with maternal emotional availability?

Figure II.4.6 – Research Question E

We analyzed the correlation between MFAS and EAS and we found no statistical significant results.
4.2.F. Do women with a lower sense of coherence have a higher rate of minor psychopathology or depression during pregnancy and six months after the child is born?

4.2.F1- Is minor psychopathology correlated with low sense of coherence along pregnancy and after delivery?

For their relevance and as a way to answer some questions posed by the study, we proceeded to the correlation analysis between psychopathology assessed by the GHQ and sense of coherence at the three time points.

We found a negative correlation between GHQ at the beginning of pregnancy and the sense of coherence in the three assessments as we can see at table II.4.30.

Table II.4.30. Correlation analysis between minor psychopathology and sense of coherence at the three assessments

<table>
<thead>
<tr>
<th></th>
<th>Sense of coherence T1 (n - 88) coefficient (p)</th>
<th>Sense of coherence T2 (n - 60) coefficient (p)</th>
<th>Sense of coherence T3 (n - 58) coefficient (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHQ</td>
<td>-0,483 (0,000)</td>
<td>-0,256(0,053)</td>
<td>-0,337(0,010)</td>
</tr>
</tbody>
</table>

4.2.F2- Is depression correlated with low sense of coherence along pregnancy and after delivery?

Is SOC during pregnancy and after delivery a protective factor for depression at the three assessments? To answer this question we used the continuous version of EDPS and as reflected in table II.4.31 we found negative concurrent and prospective correlations between sense of coherence during pregnancy and depression.

Table II.4.31. Correlation analysis between sense of coherence and depression in the three assessments

<table>
<thead>
<tr>
<th></th>
<th>Sense of coherence T1 (n 88) coefficient (p)</th>
<th>Sense of coherence T2(n 60) Coefficient (p)</th>
<th>Sense of coherence T3 (n 58) coefficient (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDPS T1 continuous</td>
<td>-0,545(0,000)</td>
<td>-0,332(0,010)</td>
<td>-0,331(0,011)</td>
</tr>
<tr>
<td>EDPS T2 continuous</td>
<td>-0,536 (0.0002)</td>
<td>-0,559(0,000)</td>
<td>-0,427(0,002)</td>
</tr>
<tr>
<td>EDPS T3 continuous</td>
<td></td>
<td></td>
<td>-0,500(0,000)</td>
</tr>
</tbody>
</table>
Pregnant women with a higher sense of coherence at the beginning of pregnancy had lower levels of depression at the end of pregnancy; and those with higher levels of depression at the beginning had lower sense of coherence at the end of pregnancy. Sense of coherence during pregnancy was not predictive for depression after delivery.

To facilitate the comprehension of the correlation results, we will present them in the following figures II.4.7. to II.4.10:
Figure II.4.7 - Correlation analysis between socio-demographic variables and mental health Indicators with psychosocial risk at T1

Pearson negative correlation

Pearson positive correlation
Figure II.4.8 - Correlation between socio-demographic variables and mental health indicators at T1

Pearson negative correlation

Pearson positive correlation
Figure II.4.9 - Correlation analysis between socio-demographic variables, mental health indicators and psychosocial risk at T1 with maternal-fetal attachment at T2

Pearson negative correlation

Pearson positive correlation
Figure II.4.10 – Correlation analysis and univariate logistic regression at T1, T2 and T3

Pearson negative correlation
Pearson positive correlation

Univariate logistic regression
Univariate logistic regression
Figure II.4.11 Synthesis of the most relevant results from correlation analysis and univariate logistic regression
PART II
ORIGINAL RESEARCH

CHAPTER 4
RESULTS

4.3. MULTIPLE LINEAR REGRESSION ANALYSIS
4.3. MULTIPLE LINEAR REGRESSION ANALYSIS

As we have stated before, to understand what are the main contributions of possible predictors to the dependent variables, we have run a multiple linear regression analysis, as all of our dependent variables in study, ALPHA, MFAS, EAS, EDPS are continuous.

As methodology we decide to use a stepwise backward multiple linear regression analysis. We have studied first the linear relations and multiple linear regression relations between demographic variables and dependent variables to get a demographic profile of those mothers who have “high psychosocial risk”, “poor maternal-fetal attachment”, “high risk of depression” and “poor or lower emotional availability to their babies after birth”.

Secondly, we have looked at how known risk factors and mental health indicators are able to predict these dependent variables.

Finally, we will present what the summative predictive value is of the predictors, based on a multiple linear regression analysis.

We have run a backward multiple regression analysis starting with all predictor variables that had a significance level of p<.25. Progressively we excluded the variables with lower statistical significance, until we arrive to a significant model. The choice of potential predictors for the multiple linear regression analysis of ALPHA, MFAS, EAS and EDPS was also guided by the major findings of the preceding correlation analysis and the literature review.

As we could have the special combination of risk factors or of some risk and protective factors, we performed first an interaction analysis. Based on theoretical considerations and results from the research literature, we have tested the existence of the following interactions:
- between high risk (ALPHA) and protective power (SOC) in predicting MFA and EA. With no significant results;
- between psychiatric symptoms (GHQ) and maternal-fetal attachment (MFA) in predicting EA, with no significant results. Only for GHQ x MFA in predicting EA structuring we have found a marginal level of significance. (p=.07);
- between depression (EPDS at T2 or EPDS at T3) and attachment (MFA) in predicting EA, with no significant results;

We conclude that there is no evidence of interactions processes between relevant predictors in explaining variation in the targeted dependent variables. As a result, we have not introduced interaction variables in the multiple linear regression analyses.
4.3.1. Multiple linear regression analysis applied to ALPHA

First, we have run a backward multiple regression analysis only using the socio-demographic variables that have shown a p< than 0.25, namely scholarity, marital situation, father’s and mother’s age. Only scholarity (p 0.044) and marital situation (0.017) remain significant predictors. Women with a low scholarity and those who are not married and don’t live with a partner have a higher level of psychosocial risk.

Next, we have run a backward multiple regression analysis only using the selected social and mental risk and protective factors that have shown a p< 0.25, namely EDPS at T1, GHQ, SOC at T1. SOC at T1 was excluded and EDPS (p 0.03) and GHQ (p 0.016) remain significant predictors. Women that were depressed and showed a higher level of psychopathology at the start of pregnancy show a higher risk of future psychosocial problems as measured by the risk indicator total ALPHA.

Finally we have run the second backward multiple regression analysis once more, but now adding scholarity and marital situation to GHQ and EDPS at T1. Only marital situation was not significant. The final results are reflected in table II.4.32.

<p>| Table II.4.32 – Multiple linear regression analysis predicting ALPHA from socio-demographic and mental health risk and protective factors |
|----------------------------------|----------------|-----------|---------|</p>
<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variables</th>
<th>Coefficient B</th>
<th>SE</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALPHA</td>
<td>Scholarity</td>
<td>-0.125</td>
<td>0.070</td>
<td>0.078</td>
</tr>
<tr>
<td></td>
<td>GHQ</td>
<td>0.313</td>
<td>0.150</td>
<td>0.040</td>
</tr>
<tr>
<td></td>
<td>EDPS T1</td>
<td>0.235</td>
<td>0.071</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Cons</td>
<td>2.140</td>
<td>0.803</td>
<td>0.009</td>
</tr>
</tbody>
</table>

According to these results, mother’s scholarity, her level of psychopathology and depression are the main contributes for her psychosocial risk in general. For each year of mother’s scholarity there in an average risk decrease of 0.125 on Total ALPHA, each point on GHQ predicts an average increase of 0.313 on Total ALPHA, and finally for each more point on EDPS at T1 there is a risk increase on Total ALPHA of 0.235. Although scholarity was found a single significant predictor, its independent contribution in the prediction model was only marginally significant, probably owing to some overlap in predictive power between scholarity and mental health indicators.

So, we can conclude that total ALPHA can be estimate through the following formula:

Total ALPHA = 2.140 -0.125 x scholarity + 0.313 X GHQ + 0.235 X EDPS 1

This model explains 36% of the variance of total ALPHA.
4.3.2. Multiple linear regression analysis applied to MFAS

First, we have run a backward multiple regression analysis only using the socio-demographic variables that had shown a p< 0,25, namely mother’s and father’s age, marital situation, immigrant situation, scholarity. Mother’s age (0,003) and immigrant situation (0,05) revealed to be significant, meaning that poor maternal-fetal attachment is especially present in very young mothers and in immigrant mothers.

Next, we have run a backward multiple regression analysis only using the selected social and mental risk and protective factors that have shown a p< than 0,205 – EDPS at T1 (0,1) VF2, F3, M2, M6, SA, GHQ. The variables that were significant were EDPS at T1 (0,1), problematic psychiatric history (M6), substance abuse (SA) and a situation of past or present woman abuse (VF2).

Finally, we have run the second backward multiple regression analysis once more, but now adding as a second block the selected demographic variables, namely mother’s age and immigrant situation.

The final results are on table II.4.33.

Table II.4.33 – Multiple linear regression analysis predicting MFAS from socio-demographic and mental health risk and protective factors

| Dependent Variable | Independent variables | Coefficient B | SE  | P>|t| | R² |
|--------------------|-----------------------|---------------|-----|-----|-----|
| MFAS               | Age                   | 0,517         | 0,158 | 0,002 | 0,28 |
|                    | M6 History of psychiatric problems (0,1,2) | 5,207 | 1,644 | 0,002 |
|                    | EDPS T1(0,1)          | -6,391        | 2,159 | 0,004 |
|                    | Cons                  | 82,975        | 4,725 | 0,000 |

According to these results for each more year of the mother, there is an increase of an average of 0,517 on maternal-fetal attachment, women with previous psychiatric or emotional problems have an average of 5,207 on maternal-fetal attachment and finally women who have an EDPS above 12, have a decrease on maternal-fetal of 6,391 on average.

So, we can conclude that maternal-fetal attachment can best be estimated through the following prediction model:

Maternal-fetal attachment = 82,975 + 0,517 x mother’s age + 5,207 x history of psychiatric problems – 6,391 x EDPS (0,1).

Maternal depression during pregnancy, a psychiatric history and young maternal age where the best predictors of poor maternal-fetal attachment and were together able to predict 28% of the variation in maternal-fetal attachment.
4.3.3. **Multiple linear regression analysis applied to EAS**

4.3.3.1. **Multiple linear regression analysis applied to sensitivity**

As scholarly was the only variable that had a Pearson correlation with a p< than 0.25, we have not run a multiple linear regression analysis.

4.3.3.2. **Multiple linear regression analysis applied to structuring**

First, we have run a backward multiple regression analysis only using the socio-demographic variables that have shown a p< than 0.25 – father’s age and scholarly. The results had not statistical significance.

Next we have run a backward multiple regression analysis only using the selected social and mental risk and protective factors that have shown a p< than 0.25, namely EDPS at T2, psychiatric history (M6), substance abuse (SA), EDPS at T3, history of violence in mother’s childhood (VF1). Only Depression at T2 had statistical relevance (p 0,016) after controlling for the influence of other predictors, so it was not possible to run a final multiple regression analysis. This model predicts 11% of the variance of structuring.

4.3.3.3. **Multiple linear regression analysis applied to non-hostility**

Following the same methodology we have run a backward multiple regression analysis only using the socio-demographic variables that have shown a p< than 0.25 – mother’s age, father’s age, schooling. We selected only mother’s age (p 0,178).

Next we have run a backward multiple regression analysis using the selected social and mental risk and protective factors that have shown a p< than 0.25, namely recent life events (F2), mother’s problematic relationship with their parents in childhood (M4), EDPS at T2, EDPS at T3. Only EDPS at T2 was selected (p 0,061).

Finally we have run a multiple regression analysis once more, using now mother’s age and EDPS at T2, but we had no significant results.

4.3.3.4. **Multiple linear regression analysis applied to non-intrusiveness**

We have done again a backward multiple regression analysis using the socio-demographic variables that have shown a p< than 0.25, namely mother’s and father’s age, immigrant situation and scholarly. Only mother’s age remain significant.
Next we have run a backward multiple regression analysis but now adding EDPS 2 to mother’s age. Only mother’s age continued almost significant (p 0,054).

**4.3.3.5. Multiple linear regression analysis applied to child responsiveness**

Following the same methodology, we have run a backward multiple regression analysis using marital situation, immigrant situation and scholarity. All of them were significant. Married women (p 0,032), immigrants (0,036) and women with a low level of scholarity (0,018) have children with lower responsiveness to their mothers.

Next we have run a backward multiple regression analysis using the selected social and mental risk and protective factors that have shown a p< than 0,25, namely low social support (F1), problematic couple’s relationship (F3), psychiatric history (M6), women past or present abuse (VF2), EDPS at T2. Only women past or present abuse (VF2) was significant (p 0,04).

Finally we have run the first backward multiple regression analysis once more, but now adding VF2. Marital situation, immigrant and scholarity had significant results that can be observed on table II.4.34.

**Table II.4.34 – Multiple linear regression analysis predicting child responsiveness from socio-demographic and mental health risk and protective factors**

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variable</th>
<th>coefficient B</th>
<th>SE</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child responsiveness</td>
<td>Immigrant situation</td>
<td>-0,532</td>
<td>0,248</td>
<td>0,036</td>
</tr>
<tr>
<td></td>
<td>Scholarity</td>
<td>0,096</td>
<td>0,039</td>
<td>0,018</td>
</tr>
<tr>
<td></td>
<td>Marital situation</td>
<td>-0,389</td>
<td>0,177</td>
<td>0,032</td>
</tr>
<tr>
<td></td>
<td>_cons</td>
<td>4,902</td>
<td>0,796</td>
<td>0,000</td>
</tr>
</tbody>
</table>

According to these results for each additional year of mother’s scholarity, there in an average increase of 0,096 on child responsiveness, babies of immigrant women have a an average decrease of 0,532 on their child responsiveness and finally the babies of married women or of those who live with their partners show a 0,389 lower score in their child responsiveness.

So, we can say that child responsiveness can be estimate through the following formula:

\[
\text{Child responsiveness} = 82,975 - 0,532 \times \text{immigrant situation} + 0,096 \times \text{scholarity} - 0,389 \times \text{marital situation}.
\]

Immigrant status, mother’s scholarity and marital situation were the best predictors of their child responsiveness and were together able to predict 22% of the variation in child responsiveness.
4.3.3.6. Multiple linear regression analysis applied to child involvement

First we have run a backward multiple regression analysis only using the socio-demographic variables that have shown a p< than 0,25, namely immigrant situation and scholarity. None of them was significant, but we only excluded scholarity.

Next we have run a backward multiple regression analysis adding recent life events (F2) to the selected demographic variables. None of them was significant, so it was not possible to find a significant prediction model for this variable.

4.3.4. Multiple linear regression analysis applied to Depression - EDPS

As we wanted to understand who were the most vulnerable women to depression, during pregnancy and six months after delivery, and what were the risk and protective factors, we have done a multiple linear correlation analysis to EDPS at T1, at T2 and at T3.

4.3.4.1. Multiple linear regression analysis applied to EDPS at T1

First we have run a backward multiple regression analysis using the socio-demographic variables that have shown a p< than 0,25, namely marital situation and immigrant situation. Both were significant. Women who live alone (0,03) and immigrants (p 0,002) are more depressed in the beginning of pregnancy. These socio-demographic variables predicted 16% of depression in the beginning of pregnancy.

Next we have run a backward multiple regression analysis only using the selected social and mental risk and protective factors that have shown a p< than 0,25, namely ALPHA and SOC. Both were significant ALPHA (p 0,019) and SOC at T1 (0,00), and predicted 34% of the variance of depression.

Finally we have run the second backward multiple regression analysis once more, but now adding marital and immigrant situation. Only marital situation was not significant, and was excluded. The final results are on table II.4.35.

According to these results, depression at T1 is mainly predicted by immigrant situation, ALPHA and SOC. Immigrant mothers have an increase of an average of 1,186 on EDPS, and each more point on total ALPHA increases EDPS in 0,389. SOC is a relevant protective factor as for each point of SOC there is a decrease of 0,145 in depression.

Concluding depression can be estimate through the following formula:
Depression T1 = 11,844 + 1,886 x immigrant situation + 0,389 x total ALPHA − 0,145 X SOC
This model predicts 40 % of depression at the beginning of pregnancy.

Table II.4.35 – Multiple linear regression analysis predicting depression in the beginning of pregnancy from socio-demographic and mental health risk and protective factor

| Dependent variable | Independent variable | Coefficient B | SE  | P>|t| | R² | 0,40 |
|--------------------|----------------------|---------------|-----|-----|-----|------|
| EDPS T1            | ALPHA total          | 0,389         | 0,16284 | 0,019 |
|                    | SOC 1                | -0,145        | 0,0454  | 0,002 |
|                    | Immigrant situation  | 1,886         | 0,65402 | 0,005 |
|                    | _cons                | 11,844        | 3,34538 | 0,001 |

4.3.4.2. Multiple linear regression analysis applied to EDPS at T2

We have run a backward multiple regression analysis using the socio-demographic variables that have shown a p< than 0,25, namely marital situation, father’s age, immigrant situation. Only marital situation was not significant, and was excluded. Father’s age (p 0,003) and immigrant situation (p 0,02) explained 18% of the variance of depression in the end of pregnancy.

Next we have run a backward multiple regression analysis using the selected social and mental risk and protective factors that have shown a p< than 0,25 ALPHA and SOC2. ALPHA was excluded.

Finally we have run the first backward multiple regression analysis once more but now adding SOC2. Immigrant situation was excluded. We present the final results at table II.4.36.

According to these results, depression in the end of pregnancy is best predicted by father’s age and SOC in the end of pregnancy. They are relevant protective factors as for each more year of the father’s age, EDPS at the end of pregnancy decreases 0,161, and for each point on SOC, EDPS decreases in 0,044.

Table II.4.36 – Multiple linear regression analysis predicting depression in the end of pregnancy from socio-demographic and mental health risk and protective factors

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variable</th>
<th>Coefficient B</th>
<th>SE</th>
<th>P value</th>
<th>R²</th>
<th>0,38</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDPS 2</td>
<td>Father’s age</td>
<td>-0,161</td>
<td>0,065094</td>
<td>0,016</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SOC 2</td>
<td>-0,225</td>
<td>0,044507</td>
<td>0,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>_cons</td>
<td>25,513</td>
<td>3,349881</td>
<td>0,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Concluding depression at the end of pregnancy can be estimate through the following formula:
Depression at T2 = 25,513 – 0,161 x father’s age - 0,225 x SOC 2
This model predicts 38 % of depression at the end of pregnancy.

4.3.4.3. Multiple linear regression analysis applied to EDPS at T3

First, run a backward multiple regression analysis only using the socio-demographic variables that have shown a $p< 0.25$ namely marital situation, father’s age, immigrant situation. Only marital situation was not significant.

Next we have run a backward multiple regression analysis only using the selected social and mental risk and protective factors that have shown a $p< 0.25$, namely ALPHA and SOC3. We excluded SOC 3.

Finally we have run the first backward multiple regression analysis once more, but now adding ALPHA. We exclude ALPHA and performed a new analysis. The final results are on table II.4.37.

Table II.4.37 – Multiple linear regression analysis predicting depression six months after delivery from socio-demographic and mental health risk and protective factors

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variable</th>
<th>Coefficient B</th>
<th>SE</th>
<th>P value</th>
<th>$R^2$ 0.21</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDPS 3</td>
<td>Father’s age</td>
<td>-0.187</td>
<td>0.06061</td>
<td>0.003</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Immigrant situation</td>
<td>1.695</td>
<td>0.63426</td>
<td>0.010</td>
<td></td>
</tr>
<tr>
<td></td>
<td>_cons</td>
<td>8.712</td>
<td>2.13016</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

According to these results, depression six months after delivery is mainly predicted by father’s age and immigrant situation. Father’s age is a relevant protective factor as for each additional father’s years, there is a decrease in EDPS of 0.187. On the contrary, Immigrants situation is a risk factor as immigrant situation increases depression in 1.695.

Concluding depression six months after delivery can be estimate through the following formula: Depression at T3 = 8.712 – 0.187 x father’s age + 1.695 x immigrant situation. So, postnatal depression is most likely among immigrant mothers and in cases where the father is young.

This model predicts 21 % of depression at the end of pregnancy.

In the figure II.4.12 are represented the results of multiple linear analysis
Figure II.4.12 – Multiple linear analysis and the most relevant results of correlations and univariate logistic regression
PART II
ORIGINAL RESEARCH

CHAPTER 5
DISCUSSION
5. DISCUSSION

5.1. DESCRIPTIVE RESULTS AND LITERATURE FRAMEWORK

5.1.1. Socio-demographic characteristics of the sample

The characteristics of the studied sample are in line with the Health Local Indicators of the Amadora region described in chapter II.1. Despite the majority of the women are Portuguese we can observe a high rate of non-Portuguese women (39.6%) with the largest group originated from Cabo Verde, most of them from the first immigrant generation. Almost 25 % of the women are single or separated, with a low level of education, and 21.7 % of them are unemployed. The fathers of their children have also a high rate of unemployment taking into account the Portuguese situation of 2009 (8.8%).

We can conclude that this sample is a risk sample, representative of the population living in this area, and clearly not representative of the Portuguese population. Despite the high rate of immigrants, within the Amadora sample these women don’t differ from non-immigrants in their demographic profile, as there are no significant differences in age, years of education or marital situation between the two groups.

5.1.2. Antenatal Psychosocial Health Assessment

There are not many studies describing the use of ALPHE, what makes the comparison of data more difficult.

We can compare our results, with those from a study done in Canada with 98 pregnant women from 4 communities in Ontario, Canada (Carroll et al 2005). These communities were urban, suburban and from small towns, with patients from diverse socioeconomic and ethnic backgrounds. A total of 21 care providers (physicians, obstetricians and midwives) were trained in the assessment with ALPHE. As we can see at table II.5.1, the sample in Canada had a similar average age as the Portuguese one, but there are also large differences between these groups, namely a higher rate of immigrants, single or separated mothers, and lower number of mother’s years of education in Portugal compared to the mentioned population studied in Canada. The sample in Amadora is also a clearly suburban population.
Table II.5.1 - Socio-demographic characteristics of women in two studies using ALPHA in Portugal and Canada

<table>
<thead>
<tr>
<th></th>
<th>Present study</th>
<th>Canada (n 98)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (sd); Min-max</td>
<td>27.8 (±5.8); 18-46</td>
<td>29.1(±5.4); 17-47</td>
</tr>
<tr>
<td><strong>Nationality</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portuguese</td>
<td>55 (59.8%)</td>
<td>Canadian 84 (85.7%)</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married /living with partner</td>
<td>69 (75%)</td>
<td>86 (87.8%)</td>
</tr>
<tr>
<td><strong>Scholarity (years)</strong></td>
<td>Mean (sd) 9.7 (± 3.7), median 9</td>
<td>high school or less 19 (19.4%)</td>
</tr>
<tr>
<td></td>
<td>min-max 0 to 18</td>
<td>some college/university 25 (20.3%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>completed college/university 68 (53.1%)</td>
</tr>
</tbody>
</table>

As we can see in table II.5.2, the rates of risk detected by ALPHA are markedly higher in our sample than in the one in Canada. This is not surprising, as we know that Amadora is a suburban population, with worrying Health Local Indicators. Curiously, only in the field of domestic violence, the risk of violence is not much higher, what might indicate that domestic violence exists across all societies, and across all social classes. Between the identified malleable determinants that we could try to influence, we find the lack of support in 25% of the women, the late onset of prenatal care, or the refusal for prenatal education in 34.8% and 14.2% of the women, a depressive mood during this pregnancy for 38% and a risk for substance abuse in 7.6%. Also concerning violence, a more complex field for intervention, but with so many implications in the future, 14.1% of the women are or were submitted in the past to abuse, and in 5.4% of the cases there was a previous child abuse from her or her husband.
### Table II.5.2 – Psychosocial risk detected by ALPHA in two studies in Portugal and Canada

<table>
<thead>
<tr>
<th>Family Factors (ALPHA F)</th>
<th>Portugal (n=92)</th>
<th>Canada (n=98)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ALPHA (0,1)</td>
<td>MODERATE AND SEVERE RISK</td>
</tr>
<tr>
<td>F1 Lack of social support</td>
<td>23 (25%)</td>
<td>10 (10.2%)</td>
</tr>
<tr>
<td>F2 Stressful life events</td>
<td>32 (34.8%)</td>
<td>14 (14.3%)</td>
</tr>
<tr>
<td>F3 Couple’s relationship of risk</td>
<td>20 (21.7%)</td>
<td>11 (11.2%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maternal Factors (ALPHA M)</th>
<th>Portugal (n=92)</th>
<th>Canada (n=98)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1 Prenatal care (late onset)</td>
<td>32 (34.8%)</td>
<td>1 (1%)</td>
</tr>
<tr>
<td>M2 Prenatal education (refusal or quit)</td>
<td>13 (14.2%)</td>
<td>5 (5.1%)</td>
</tr>
<tr>
<td>M3 Feelings towards pregnancy after 20 weeks</td>
<td>32 (34.8%)</td>
<td>8 (8.2%)</td>
</tr>
<tr>
<td>M4 Relationship with parents in childhood</td>
<td>21 (22.8%)</td>
<td>8 (8.2%)</td>
</tr>
<tr>
<td>M5 Self esteem</td>
<td>27 (29.35%)</td>
<td>8 (8.2%)</td>
</tr>
<tr>
<td>M6 History of psychiatric/emotional problems</td>
<td>24 (23.1%)</td>
<td>13 (13.3%)</td>
</tr>
<tr>
<td>M7 Depression in pregnancy</td>
<td>35 (38%)</td>
<td>8 (8.2%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substance Abuse (ALPHA SA)</th>
<th>Portugal (n=92)</th>
<th>Canada (n=98)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>7 (7.6%)</td>
<td>1 (1%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Family Violence (ALPHA VF)</th>
<th>Portugal (n=92)</th>
<th>Canada (n=98)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VF1 Woman or partner experienced or witnessed abuse</td>
<td>15 (16.3%)</td>
<td>14 (14.3%)</td>
</tr>
<tr>
<td>VF2 Current or past woman abuse</td>
<td>13 (14.1%)</td>
<td>6 (6.1%)</td>
</tr>
<tr>
<td>VF3 Previous child abuse by woman or partner</td>
<td>5 (5.4%)</td>
<td>4 (4.1%)</td>
</tr>
<tr>
<td>V4 Child discipline</td>
<td>1 Risk 4 (4.3%)</td>
<td>4 (4.1%)</td>
</tr>
</tbody>
</table>

#### 5.1.3. Depression

In our sample, 19.57% of the women in early pregnancy, 7.69% at the end of pregnancy, and 7.94% of the women six months after birth, had a EDPS higher than 12, the cut-off suggested in the literature for the definition of case (Warner et al, 1996), and recommended by the Portuguese Ministry of Health (Ministério da Saúde, 2005). Although there was a decline in the rate of depressed women across pregnancy, there was no evidence that the more depressed
had dropped out. In fact, we can observe the same decrease in EDPS, in the 55 women that completed the three moments of assessment. Only 5 (8%) of the women had a chronic depression, with an EDPS of more than 12 at all the three moments of assessment.

According to Leadbater & Linares 1992, 50% of women who live in a low social economical status report depressive symptoms, so it would be understandable that these women are at a considerable risk of depression. This study didn’t pretend to study postpartum depression, so depression was not measured after birth, but only 6 months later. The rate of "cases" (values >12) at T3 is similar to the rate in the end of pregnancy (7,94% vs. 7,69%). This value is, however, lower than the value indicated by the literature for postpartum depression, namely between 8 and 15% (Pitt, 1968, Cox et al 1982, Kumar & Robson 1984, Watson et al 1984, Cooper et al 1988, Cox et al 1993, cited by Warner et al 1996). In Portugal a rate of 13,1 % of post-partum depression was reported by Augusto et al (1996). If we reanalyze the results of ALPHA, namely question M7 (depressive mood during this pregnancy), we can find that in the beginning of pregnancy 5,4% of the women were at a high risk of depression during this pregnancy, 32,6 % at a moderate risk of depression and in 62% there was no risk at all. Despite the existence of a moderate or high risk of depression for 38% of the pregnant women in the beginning of pregnancy, as evaluated by ALPHA, and 19,57% of cases diagnosed with EDPS, the rate of cases decreases in the end of pregnancy (T2) and this value stays stable in the third assessment (T3). This might reflect the interaction with protective or positive factors that have emerged during pregnancy or during the months after birth.

We also have to consider, that this sample includes women from different cultures, and that depression does not have always the same way of being expressed. Symptoms of depression like worry, irritability and fatigue might have different interpretations between cultures (Allbright & Tamis-Lemonda 2002).

5.1.4. General Health Questionnaire

We obtained for GHQ, a mean value of 1,752 (±2,31) with a median of 1 with values ranging from 0 to 10. The rate of probable cases (GHQ ≥3) was 24,7 %, what seems to be a very high rate. This rate is not surprising, as it is in line with results of the National Mental Health Epidemiologic Survey developed by Caldas de Almeida JM, Xavier, M. (2013) in which 22,9 % of the sample studied had a psychiatric disorder in the 12 months previous to the study. This
means that Portugal is one of the countries in Europe (with North Ireland) with the highest prevalence of psychiatric disorders, especially anxiety disorders, clearly distinctive of the pattern in other South European countries. In this national survey, women, younger aged people, separated or widows were the groups with a higher prevalence of psychiatric disorders. Women had a higher risk than men of developing depressive disorders (OR=2.30) and anxiety disorders (OR=2.89), while men have a higher probability of suffering impulse control disturbance and substance abuse. These results are also in line with the study developed by the European Commission “The state of Mental Health in the European Union” in which Portugal is the country with a largest risk of psychiatric disorder for women when compared with men.

5.1.5. Sense of Coherence

In this study we obtained for SOC, average values of 59.66 (±10.46) at T1, of 63.85 (± 9.42) at T2 and of 64.69 (± 9.46) at T3. If we analyze only the 55 women that complete the three assessments we find the same increase in the average values of SOC, excluding the hypothesis that, the women with lower scores had dropped out along the study. Sjostrom et al 2004, proposes the classification of SOC in three levels as suggested by Langius et al (1996): low SOC including scores between 35 and 60; moderate SOC with values between 61 and 75; high SOC with values between 76 and 91. According to this division the values we obtained were in the inferior limit of the moderate values, and increased during pregnancy and after birth. According to Sjostrom et al (2004), pregnancy and delivery are life events that do not affect the degree of the women’s SOC.

For Antonovsky SOC remains stable in adulthood as long as no radical life-event occurs. According to the author of the concept and scale, it is possible that an occasional change in life might temporarily modify the degree of SOC, but the majority will return to their original SOC. This is a controversial question, as some authors found consistent higher values of SOC in pregnant when compared with non-pregnant women in Sweden (Larsson & Kalemberg, 1996 cited by Abrahamsson & Ejetsson, 2002) and in Canada (Wolff & Ratner, 1999 cited by Abrahamsson & Ejetsson, 2002). For Abrahamsson and Ejetsson (2002) pregnancy can implicate an increase in SOC, because pregnancy is a period characterized by a strong existential feeling (Castro 2005). Pregnancy can be understood as a period of change where the women have to deal with new challenges, and a good SOC helps her in dealing with a new reality.
Apart from these considerations, the values we obtained are lower than the results from a Danish study (Sjostrom et al 2004), that evaluated SOC in a sample of pregnant women also in the beginning and in the end of pregnancy and 8 weeks after delivery. In this Danish study the average values of SOC in early pregnancy were of 67 (±12), of 68 (±11) in the end of pregnancy and of 67 (±10) six months after birth.

5.1.6. Maternal-Fetal Attachment

In line with the authors that consider MFAS as a maturational process, advising its utilization in the end of pregnancy, we applied MFAS at T2 (Miculincer & Florian 1999; Caccia et al 1991). The values we obtained for MFAS varied between 81 and 111, with an average of 98,015 (±8,098) and a median of 100.

In order to compare data and clarify the meaning of these results, we will present some studies using MFAS:

In a study in USA evolving 189 pregnant women with no known fetal abnormalities, no bipolar and psychotic disorders, no reported arterial hypertension or diabetes, and no alcohol abuse, McFarland (2011) assessed MFA in the end of pregnancy, obtaining values between 63,84 and 118,08. MFAS was significantly different in depressive and non-depressive women, as the first had a mean value of 95,29 and the second a mean value of 103,92.

As cultural differences are relevant for analyzing the results in this study, we reviewed studies with multicultural groups.

A study developed by Ahern et al (2003), assessed 20 African American and 20 Hispanic American pregnant women, and found no significant statistical differences in MFAS, obtaining a mean value of 89,7 (±13,9) for the African American and of 94,5 (±9,2) in the Hispanic American women.

A convenience group of 166 women, with a low socio economic status was studied in Baltimore, primarily African American (>95%), obtaining a mean value of 84,2 (±14,2) for MFAS (Alhusen et al 2012).

Other studies assessed MFAS in the end of pregnancy, obtaining a mean value of 97,92 (±11,52) (Garce, 1989); Heidrich & Cranley (1989) assessed 91 pregnant women to evaluate the effect of fetal movements, ultrasounds scan and amniocentesis on MFAS along pregnancy, obtaining at 16 weeks of pregnancy, mean values of 88,32 for MFAS in the control group, and of 89,76 at 20 weeks of pregnancy.

So, we can conclude, that the results for MFAS in our study, are higher than in the majority of the researches. The fact that we have found relative high levels of MFA, compared to other studies, in a population with many indicators of a risk population (i.e. the high level of risk factors detected by ALPHA, high rates of depression and a low SOC), make us think, that maybe pregnancy is a period of hope, used as an opportunity to change life.
But we can also raise the question, about what is the meaning of a high maternal-fetal attachment? Like other authors that criticized the concept, we can admit that MFA is a useful tool to be considered in clinical work but with limitations in its use as a scale and to be used in research. The simple fact that by definition MFA is not directly observed, but only evaluated from mother’s description, stresses the subjective nature of this scale, and the possible influence by projective feelings of the mother. It’s only based on what women report, a mix of their feelings, idealizations, projections and needs. Supporting these considerations, Sjogren et al (2004) showed a positive correlation between the tendency to feel guilt, anxiety and the experience of social desirability with MFAS, as well as a negative correlation between emotional detachment and MFAS. So, in our opinion, these high values on MFAS in the present study should be interpreted with prudence.

5.1.7. Emotional Availability

In the present study we obtained a mean value of 4.08 (±1.144) for sensitivity 4.18 (±1.1103) for structuring, 3.97 (±1.100) for non-intrusiveness, 5.41 (±1.202) for non-hostility, 4.16 (±1.241) for child responsiveness and 3.69 (±1.323) for child involvement.

To our knowledge, there are few studies with EAS (version 0-5) in which the children were assessed with an age close to that of the children in our sample. For a better understanding of the meaning of our results we will present in table II.5.3, the results of two studies similar to ours.

One of them is a large study of 220 mothers and their child, where their interaction at the 5th month of the child and later at 20 months of age was evaluated with EAS (Bornstein et al 2010). They were from 2 geographic regions within each of 3 countries. Seventy dyads (mother and baby) were from Argentina (40 in metropolitan Buenos Aires, 30 in rural Córdoba Province); 70 resided in Italy (40 in metropolitan Padua, and 30 rural Basilicata); 80 dyads resided in USA (40 in metropolitan Washington and 40 in rural West Virginia). The six samples represent a range from low to upper-middle SES.

Another recent study using the same version of this instrument was developed by Licata et al (2013), assessing 37 German speaking mothers and their children, who had an average age of 7 months, ranging from 6.53 to 7.67 months what is close to the baby’s age in our sample. The families were recruited from public birth records, but the final sample was a middle class sample.
The comparison between our results and those obtained in the first assessment of the study developed by Bornstein et al at 5 months, and in the study of Licata et al that occurred at the 7th month of the child, are in table II.5.3.

According to the exiguity of studies using this version of EAS at the same child’s age, it's difficult to conclude what the meaning is of these results, as there are urban/rural differences between the samples of the three studies. The sample in the study of Licata is from an upper socioeconomic class in contrast to the samples of the other studies, and we didn’t have access to the partial results of the Bornstein study for each urbanization category. It could be helpful to compare our results with the values of EAS in the urban group, and not the results of the rural and urban women taken all together as they are presented in the Bornstein study.

<table>
<thead>
<tr>
<th></th>
<th>Sensitivity</th>
<th>Structuring</th>
<th>Non-intrusiveness</th>
<th>Non-hostility</th>
<th>Child Responsiveness</th>
<th>Child Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Present study</strong></td>
<td>4.08 (±1.144)</td>
<td>4.18 (±1.103)</td>
<td>3.97 (±1.110)</td>
<td>5.41 (±1.202)</td>
<td>4.16 (±1.241)</td>
<td>3.69 (±1.323)</td>
</tr>
<tr>
<td><strong>Bornstein et al</strong></td>
<td>6.44 (±1.41)</td>
<td>4.20 (±0.75)</td>
<td>4.71 (±0.56)</td>
<td>4.80 (±0.45)</td>
<td>5.19 (±1.03)</td>
<td>5.11 (±1.01)</td>
</tr>
<tr>
<td><strong>Licata et al</strong></td>
<td>4.47 (±1.26)</td>
<td>4.51 (±1.30)</td>
<td>5.51 (±0.98)</td>
<td>5.97 (±1.06)</td>
<td>4.70 (±1.29)</td>
<td>4.28 (±1.08)</td>
</tr>
</tbody>
</table>

The largest differences in the values obtained are in sensitivity (the International study has clear higher results, but our results are not so different from the German results) and the smallest differences are on structuring where the values are very similar in the three studies.

We have to admit that cultural differences could explain the existing differences in non-intrusiveness, as the two coders of EAS in the present study (belonging to different cultures), had different interpretations in the initial scorings of this scale of EAS. For the final scoring, there was reached agreement about the way non-intrusiveness in the interaction should be scored, respecting the scale. Some authors studied the different patterns of mother-baby interaction according to different cultures. Tamis LeMonda et al (2012) consider that interactions are multimodal, as parents use different ways to communicate, such as gestures or vocalizations, and that the pattern utilized has cultural origins. They describe that Mexican mothers, who have a Latin culture use more gesture and more regulatory language than African American mothers that are more likely to use distal forms of communication and rely less on
gesture than Latinos. They cite Kendon (2004), who after studying Italian mothers, argues that this communication pattern is transmitted to the child. Italian mothers use a gesture-rich interaction with the others and with their children, which display a greater repertoire of gestures in their infants than American children.

This could explain the differences in our sample between Portuguese and non-Portuguese mothers. The last are all first or second generation immigrants from African countries. It could also explain the differences between our sample, the German mothers and the mothers in the International sample. This sample included Italian and Argentina mothers, that we can assume to have also the same type of Latin interaction.

Mc Fadden and Tamis-Lemonda (2013) discussed the role of intrusiveness in mother-child interaction. In a study about mother-baby interaction in a group of low socio-economical situation women, they concluded that when maternal responsive / didactic parenting was low, intrusiveness played a buffering role on low didactic parenting. In such conditions, intrusiveness may have provided the child with stimulation that they otherwise were not receiving. According to these authors, these results not only reinforces previous results that demonstrated the negative association between detached or uninvolved parenting and child outcomes (Berlin et al 2002) but also explain the relevance of examining intrusiveness in the context of other behaviours that parents display. So, intrusiveness appears to provide the child with parental stimulation in cases where the mother would fail to display other positive parenting behaviour. In contrast, high intrusiveness was prejudicial for the child, when it was associated with mother’s negativity, as they would be reflecting hostility or harsh parenting. According to these authors this would be the explanation for some previous results who found no association between intrusiveness and child outcomes (Bawmwell et al, 1997) concluding that whereas studies on low income mothers have focused on the dangers of intrusive controlling behaviours for children’s development, the impact of intrusiveness will depend on mother’s relative levels of responsive/didactic behaviours and negativity.

Notwithstanding the meaning of these reflections and results about cultural differences, we have to emphasize that in comparison to other studies we found low levels of sensitivity in the mothers, and poor values of child responsiveness and child involvement in our study, as they reflect the real impact that interaction has on the child.
5.2. RESEARCH QUESTIONS

5.2.A - In pregnant women, which variables are associated with an increased psychosocial risk, as measured by ALPHA at the beginning of pregnancy?

According to our results, low mother’s education, low father’s age and being single or divorced are associated with a higher psychosocial risk during pregnancy, as these variables are negatively correlated with Total ALPHA. A low level of mother’s education is correlated with multiple risk factors evaluated by ALPHA, namely the lack of social support, a couple’s relationship of risk, refusal of prenatal education, risk feelings toward pregnancy, a difficult relationship of the mother with their own parents and also with the subtotal of family risk factors, substance abuse and risk in general evaluated by Total ALPHA.

These results are in line with many studies that highlighted the relevance of education of women for promoting the development of society. The fact that women stop early their studies, put them in a situation of more vulnerability and dependence. One of the main goals to improve the development of a country is the empowerment of women through education.

Younger fathers have a higher risk of having a difficult couple’s relationship, are more associated with mothers who have a psychiatric history of risk, a higher risk of substance abuse, and with a higher level of risk in general measured by total ALPHA.

Single or divorced mothers have a higher probability of having couple’s relationship of risk, a low self-esteem, more family risk factors in general and also a higher level of risk measured by total ALPHA.

Being immigrant or non-Portuguese is correlated with recent difficult life-events and a higher level of family factors, but not with total ALPHA.

In what concerns mental health dimensions, our results show that depression in the beginning of pregnancy is positively correlated with multiple risk factors, like the lack of social support, the existence of life events, of problems in the marital relationship, difficult relationship of the mother with their own parents, low self-esteem, a history of psychiatric/emotional problems, a history of depression, with family, maternal and family violence subtotal risk factors and finally with Total Alpha. These results are similar to almost all the factors that supported the development of ALPHA. Many other studies have reported as determinants of depression during pregnancy or after birth, a past history of depression, low social support, a poor marital relationship and recent life events (O’Hara & Swain 1996; Wilson et al, 1996). Although in our
study depression was correlated with lack of social support, it is not correlated with the use of a particular type of support, namely prenatal care or education.

A higher rate of minor psychopathology is correlated with stressful life events (F2), the existence of negative feelings about the pregnancy at 20 weeks, a low self-esteem, the existence of psychiatric history and a history of depression during pregnancy, Family and Maternal risk factors, risk of substance abuse and total ALPHA. Sense of coherence seems to be a relevant protective factor. A high level of sense of coherence is negatively correlated with stressful life events, couple’s relationship of risk, relationship of risk with parents in childhood, low self-esteem, psychiatric history, previous history of depression, current or past woman abuse, child discipline; and also with Family, Maternal and Family Violence subtotals.

A multiple linear regression analysis has been run, to understand which were the main predictors of total ALPHA. The conclusion was that the number of years the mother had studied, her level of psychopathology and depression in the beginning of pregnancy were the main contributors to the level of psychosocial risk evaluated by ALPHA in the beginning of pregnancy, and that this model explained 36% of the variance of total ALPHA.

5.2.B. Which pregnant women are more vulnerable to depression, minor psychopathology or lower sense of coherence?

According to the literature for several risk factors for depression is indistinguishable, whether or not they have started before pregnancy, during pregnancy or postnatal. This applies, for instance, to a past history of depression, low social support, a poor marital relationship and recent life events (Beck, 1996, O’Hara & Swain, 1996; Wilson et al, 1996).

In this study we concluded that there is a negative correlation between marital status and depression during all pregnancy, being single or divorced increases the level of depression, but not six months after the child is born. Our results support other studies that confirmed that non existence of marital support is associated with increase of postpartum depression (Campbell et al, 1992). Compared with mothers in two-parent families, single mothers experience high levels of depression and family stress and lower levels of social support (Benzeval, 1998; Lipman, Boyle & Dooley, 2002) and access to mental health services. Being immigrant or non-Portuguese was also associated with a higher level of depression in early pregnancy, but not in the end of pregnancy. Women that are natural from Cabo Verde have a four times higher risk (OR=4.167) of having a higher level of depression (EDPS than 12) in the beginning of pregnancy compared with the Portuguese pregnant women (category
women from Angola have a risk of depression 20 times higher (OR= 20) and those who are from S. Tomé have ten times a higher risk of having higher levels of depression (EDPS than 12) with respect to Portuguese pregnant women. The women from the first generation immigrants have a 4.5 times greater risk of having depression (EDPS>12) than non-immigrants, and second generation immigrant have a 15 times higher risk for depression than non-immigrants who constitute the reference category. In many studies migration has been identified as a risk factor for depression during pregnancy and after delivery (Dankner et al, 2000; Rubertsson et al, 2005; Goyal, Murphy & Cohen, 2006). Cox et al, (1987), identified depression in 42% of migrant woman, and concluded that immigrant women who immigrated more recently are at lower risk of depression. Several risk factors identified by ALPHA are positively correlated with depression at the three moments of assessment, in the beginning and in the end of pregnancy and after the child is born.

Analysing which factors have impact during pregnancy, the existence of stressful life events, maternal psychiatric history or depression during current pregnancy, the Maternal and Family risk factors, and Total ALPHA, are correlated with depression in the end of pregnancy. Some risk factors only have impact at the beginning of pregnancy, like a poor social support, a couple’s relationship of risk, a problematic relationship of the mother with her own parents, a low self esteem, current or past women abuse, and the subtotal of family violence. Other ALPHA questions are only correlated with a higher level of depression in the end of pregnancy like the existence of risk feelings about pregnancy and the risk of Substance abuse.

If we analyse the correlations between the risk factors assessed in the beginning of pregnancy and depression after the child is born, only a history of psychiatric problems, depression in current pregnancy, Maternal Risk Factors subtotal and substance abuse and Total ALPHA were found significant predictors of depression six months after birth.

The main correlates of depression in early pregnancy are total ALPHA, a low sense of coherence and being immigrant. For depression in the end of pregnancy the main predictors are low father’s age and a low sense of coherence, and finally for depression six months after birth the main predictors are again young father’s age and being immigrant.

In our opinion, these differences are the results of the different adaptive mechanisms that occur during pregnancy, with more or less success.

As we have discussed, risk is cumulative and many studies have found that the total number of risk factors has a major impact on the development of pathology. It is, therefore, especially relevant to look at the correlations between total ALPHA and depression at the three moments of assessment. The results on depression confirm the impact of cumulative risk and the value of ALPHA as a cumulative risk measure. It’s also relevant to conclude that depressive women in the beginning of pregnancy have a higher psychosocial risk that will be associated with higher rates of depression late in pregnancy and after birth.
Our results are in line with the principles from which the ALPHA has been developed, and with the outcomes of multiple previous studies. In the metanalysis of Beck (2001), for instance, the risk factors identified for postpartum depression were identified as moderately related with depression: prenatal depression, low self esteem, difficulties with child care, high stress load, low social support, poor marital relationship, and a history of depression, and also but with a smaller effect, single marital status, low socio-economic status and unplanned pregnancy. In the metanalysis of Robertson et al 2004, the strongest risk factors were prenatal depression, prenatal anxiety, stressful life events, a lack of social support and a history of depression during pregnancy. Moderate risk factors were poor marital relationship and neuroticism. The risk factors that influence depression during pregnancy seems to be the same as those that influence depression after birth in an indistinguishable way.

In what concerns psychopathology, being single or divorced, being immigrant or non Portuguese are associated with a higher level on GHQ.

Analysing sense of coherence we could observe that pregnant women who are married or living in a marital relationship have a greater sense of coherence in the beginning of pregnancy in comparison to single mothers, but this difference does not exist anymore in the end of pregnancy or after the child is born. Sense of coherence at the three moments of evaluation is negatively correlated with psychosocial risk at the beginning of pregnancy and the association at T1 suggests that sense of coherence is a protective factor. This negative correlation exists with several individual risk factors and with the family, maternal and family violence subtotals at the beginning and end of pregnancy. This results support our expectation about the protective role of sense of coherence on risk development through its adaptive power which might results in less risk factors.

5.2.C - What are the determinants of maternal-fetal attachment at the end of pregnancy?

According to our results on demographic predictors, only mother’s and father’s age are correlated with an increase in maternal-fetal attachment. The other socio-demographic factors are not correlated with MFA.

In what concerns the risk factors detected by ALPHA that can be associated with a later decrease in MFAS, on the contrary to the review of Yarkeshi, we found no influence of poor social support (F1) on MFA. We only found a significant correlation between current or past women abuse that, surprisingly, is associated with a higher MFAS. After running a multiple linear analysis we concluded that a history of past psychiatric disorders is also one of the main predictors of a higher MFAS.
There was no correlation between depression, minor psychopathology or sense of coherence in the beginning or end of pregnancy, and MFA, used as continuous variables. But, women diagnosed as cases for depression (EDPS>12) have a statistically significant lower maternal fetal attachment, than those who were not depressed according to this criteria, and this difference was statistically significant.

Analysing the main predictors of maternal-fetal attachment through a multiple linear regression analysis we concluded that the young age of a mother and a level of EDPS higher than 12 are predictors of a low maternal-fetal attachment. Surprisingly a history of psychiatric or emotional problems increases maternal fetal attachment. Together these three most important predictors were able to explain 28% of variance in MFA. This stresses the need for further research on variables that might explain the value of MFA in a multicultural maternal sample as in our study.

A higher age of the parents usually reflects a more stable and mature relationship and young mothers have more difficulties on parenting (Bernard et al 1996). Comparing our results with previous studies, mother’s age was also concluded to be relevant in some of the studies that were reviewed by Canella (2005), but not in others. The results were contradictory and inconsistent. For instance, the reviews of Alhusen (2008) and Yarcheski (2009) concluded that mother’s age was not a relevant factor. We didn’t found other studies that analysed the influence of father’s age on MFAS. This inconsistency might be caused by cultural differences between the study samples.

In what concerns the association of marital status with MFAS, the absence of such an association in our study is not in line with those of Portuguese and some International studies. According to Mendes, to be married or living in a marital situation is correlated with a higher MFA. For this Portuguese author marital relationship was the most powerful support for pregnancy acceptance, and adaptation, and also for MFA. These results are supported by Lindgren (2001) and Wayland cited in the review of Canella (2005), but not by other studies (Lerum & Lobiondo-Wood 1989 also cited by Canella), or meta-analysis (Yarkeshi 2009). The fact that nationality does not influence MFAS is in line the conclusions of Ahern & Ruland, showing that MFA is a transcultural concept and experienced in a similar way by women from different cultures.

The lack of other associations or even the strange result that mothers submitted to domestic violence or those who had a psychiatric history had a higher MFA, triggers questions such as, how does MFA is constructed and developed across pregnancy, what do pregnancy and a child to born represent to the mother, what does she project for the baby and her future, what does a new child represents to a mother who is or was exposed to domestic violence, and how does she insert the child in her own narrative. While pregnancy and to be a mother can be an excellent experience of maturing and an opportunity to change, the truth is that an excessive
idealization of maternity and of the baby after experiences of domestic violence can create future difficulties in the confrontation with reality.

As Sjogren et al (2004) demonstrated, MFA is positively correlated with personality traits of the pregnant women, namely the tendency to feel guilt, aggression inhibition, and the desire of social desirability and negatively correlated with emotional detachment and psychic anxiety. Using indicators for personality traits in our study might have offered the opportunity to better predict poor MFA.

The studies focused on the influence of mental health dimensions in MFA are contradictory. While authors like Mercer 1988 found a weak negative correlation between depression and MFA in low but not in high risk women, others like Lindgren 2001 found no significant correlation; in the meta-analysis of Yarkeshi 2009 the r effect sizes indicated that the relationship between depression and MFA is low; Hart and McMahon 2006 demonstrated that women characterized as having low quality of fetal-attachment reported significantly higher levels of anxiety (state and trait) and depression, but the author mention that these results should be cautiously interpreted because of the small sample size, and the fact these pregnant women were highly educated, married and employed.

In her critical review on maternal fetal-attachment, Alhusen 2011, concluded that the studies reviewed (Hart and McMahon 2006; Lindgren 2001, Zachariach 2004) support the association of psychological well being /distress and MFA. The fact that SOC is not predictive of a strong MFAS, was also supported by Castro (2005). We found no others studies that analyses the correlation between these two variables.

Our poor results on predicting MFA are not surprising as the reviews and metanalysis about MFA described in Chapter 2, Part I, were not very encouraging. The difficulties in predicting MFA might also be caused by the operationalization of this concept in a scale, emphasizing possible limitations of this instrument. Nevertheless, the reliability of MFA Scale in our study was satisfactory (α =.77), which excludes an attribution of poor prediction findings to this kind of scale limitation. If is still possible that the scale needs more improvement in its validity.

5.2.D – What are the determinants of postnatal mother-child interaction, more specifically mother-baby emotional availability?

Foreign nationality of mothers, here more generally defined as immigrant status, is correlated with a lower child responsiveness. We didn’t found earlier studies that support this finding. This relation might be caused by a mediating role of maternal depression while
immigrant women show higher levels of depression and we found indications for an impact of maternal depression on mother-baby interactions. It is also possible that the relation is caused by maternal sociability that is related to both variables. 

**Mother’s scholarly** is positively associated with a higher sensitivity of the mother and a higher responsiveness of the child. Each more year of education predicts an increase of the possibility of a greater child’s responsiveness with 18%. This is a very interesting result, as it’s a possible explanation for the major impact that women’s education has on the emotional development of the children. Other studies have also showed that the mother’s level of education is positively related with maternal responsiveness, stimulation, language and playfulness (Grossman & Grossman, 2000; Meins et al 2003; Bigelow et al 2010). Fonseca et al (2010) also found a correlation between mothers’ level of education and maternal sensitivity in their babies from birth to 36 months. These results are also in line with a study by Biringen et al (2000), with mothers and their 5 years old children, who demonstrated that sensitivity, structuring and non-hostility are predicted by the level of maternal education; maternal education explained 15% of the variance of maternal sensitivity. At the same time, studies have shown that low education level of mothers increases the likelihood of emotional and behavioural problems in the child (Carneiro et al. 2010). This might be mediated by poorer maternal emotional availability and poorer mother child-interaction patterns. So, this is a very relevant conclusion with political implications.

**Mother’s age** is important for intrusiveness, as for each additional year of the mother the possibility of non-intrusiveness increases by 13%, i.e. reduces her intrusiveness related to the baby. Mother’s age become more relevant, if we compare it with the lack of impact of father’s age. According to the outcomes of multiple logistic regression, for each additional year of the father the possibility of mother’s structuring capacity to the baby increases by only 0.07%.

A higher age of the parents usually reflects a more stable and mature relationship. Despite these women were not adolescents, some of them are very young. According to the literature, young mothers have more difficulties on parenting (Bernard et al 1996) and increase the rate of child abuse or neglect (Branowski 1990). They have more frequently an insecure attachment style (enmeshed, angry-dismissing, or fearful) than adults in general (Figueiredo, 2006). Other studies support that young mothers have higher rates of intrusive/controlling mothering behaviour when compared with older mothers (Berlin, Brady-Smith & Brooks-Gunn 2002).

We did not find any statistical significant correlation between the different questions of ALPHA, its subtotals or Total ALPHA and the different dimensions of EAS. So, in general, prenatal psychosocial risk did not predicted in this study the quality of mother-child interaction during the first months of life. The only significant correlation we have found between ALPHA and EAS was between current or past abuse in the beginning of pregnancy and a later lower child responsiveness, what highlights a relevant impact of violence on the child emotional answer.
Marital situation does not influence mother-baby emotional availability except on responsiveness. Surprisingly being single or divorced is one of the main contributes to a good child responsiveness. We didn’t found any other studies supporting this result and we don’t have a clear explanation for it. We can speculate that these mothers would focus their attention on their child, increasing her responsiveness, but we think that other studies are needed to confirm this result.

Not at the start, but at the end of pregnancy, depression is negatively correlated with mother’s structuring; more depressed mothers have lower capacity to structure the relation with the baby. If we dichotomize depression, using the recommended cut-off for the definition of case, depression in the end of pregnancy, is negatively correlated with structuring and also with non-hostility. Depressed mothers are more hostile and have a lower capacity of structuring their interaction with the baby.

GHQ and SOC at the three moments of assessment had no correlation with emotional availability.

There are numerous studies that prove the impact of depression on mother-child interaction (Campbell, Cohn & Meyers 1995; Lyons Ruth, Easterbrooks & Cibelli 1997; Teti et al, 1995; Downey & Coyne 1990). Depressive symptoms are common in women especially in those who live in poverty and that don’t have access to the resources or the treatment that is needed (Albright & Tanis- Lemonda 2002).

According to Field (2002a, 2002b) and Lyons-Ruth (2002) there are two contrasting maternal depression interaction styles: withdrawn and intrusive. Gelfand and Teti (1990) also described two manifestations of maternal depression: “one predominantly angry, rejecting and harsh, capricious discipline”; the other “apathetic, self absorbed, tearful and irresolute as a disciplinarian”.

Mothers can also be ambivalent between these two ways of interacting, confounding the child. So the child can answer by imitation and become depressive, irritable, and hostile to mother, creating a vicious circle; or the child answers to the mother in a disorganized and avoiding way, not expressing positive affection, what has a negative effect on the mother.

Albright & Tamis-Lemonda (2002) studied the impact of maternal depression on mother-child interaction in 53 American mothers arising from different cultures (namely white, Latin and African American). According to their results depressive symptoms are associated with less sensitivity, less engagement, less flexibility and less positive affection in mothers and with less mutuality, less reciprocity and less enjoyment on dyads.

In sum, immigrant status, scholarship, age and current or past abuse of the mother play all a role in predicting the quality of the mother-baby relationship, but these relations are divided across different aspects of that interaction. Of the mental health indicators only depression at the end of pregnancy had a negative impact on the mother-baby interaction, in particular on mother’s
structuring and non-hostility. Taken together the use of multiple risk factors did not resulted in strong summative predictions of mother-baby interactions. Only for child responsiveness a prediction (R2) was found of 22%.

5.2.E - Is maternal-fetal attachment related with postnatal mother-child interaction, more specifically with mother-baby emotional availability?

We analyzed the correlation between MFAS and EAS and found no statistically significant results. One of the most important aims of this study was to prove the predictive value of MFAS for mother baby interaction. We discuss different explanations for these negative results.

- The moment in the first year when mother-baby relationship was evaluated (timing). Reviewing the literature, in her meta-analysis Canella reported the studies of Mercer & Ferkestish (1990) that showed that MFA predicted the quality of mother-infant bonding after birth, but not at a child’s age of 8 months. Fuller (1990) also found an association between MFAS and mother-child relationship assessed in the second and third day after delivery. In the present study the mother baby interaction was evaluated six months after birth.

- The impact of MFA might occur through mediator factors that have not been evaluated in this study. Several studies analysed the impact of MFAS on maternal skills, on the mood of the baby, or on family mutuality (Wilson et al, 2000). MFA influences women’s investment in pregnancy, the assumption of healthy practices, and the desire of protecting the baby, what is correlated with a later good child health. Reviewing the literature, despite some studies assumed an impact of MFA on mother-baby attachment, we can conclude that these results are many times inconsistent and contradictory, raising the question of the way mothers project in the baby their hopes and problems. In a study with drug abuse mothers that analyses the influence of prenatal maternal representations on EA, the authors concluded (Flykt et al, 2012) than these mothers tended to idealize their baby, specially the first, and that after birth they continue to idealize it or became disappointed with the child.

- Disappointment or idealization predicted EA problems, and constitutes a risk for adequate parenting. Negative expectations influence the mother on not investing in the child, but an excessively high expectation makes the mother to see the baby as a saviour of her own (Belt & Punamaki 2007). When later the child is born, the confrontation with reality may lead to hostile negativity and to intrusiveness (Twentyman & Plotkin 1982) which may end in child abuse (Lyons Ruth et al, 1987).

This would contribute to understand why mothers in a high risk sample evaluated by ALPHA, despite having high levels of MFA, this excellent MFA had no correlation with later EAS. We assume that the hope, the opportunity of change in what they invested in
maternity and the child, is often frustrated by all the others difficulties that exist 6 months later after birth.

5.2.F. Do women with a lower sense of coherence have a higher rate of minor psychopathology or depression along pregnancy and six months after the child is born?

We found a negative correlation between GHQ and sense of coherence at the three moments of assessment. Sense of coherence at the three moments was also negatively associated with depression in the same moments of assessment, during pregnancy and 6 months after birth. Pregnant women with a higher sense of coherence in the beginning of pregnancy have lower levels of depression during pregnancy but this correlation is not statistically significant anymore 6 months after birth, which is 14 months later.

These results are in line with a study developed by Sekizuka et al (2006), who showed that women with a higher score on SOC had low levels of depression, suggesting that a low SOC can affect mental health.

Several studies demonstrated the clear relationship between SOC and factors related to mental health such as self-esteem, locus of control, resilience (Johnson 2004), optimism, self-efficacy, mastery and social skills. Inversely SOC is associated with anxiety and depression (Chumbler et al, 2003).

For women, pregnancy and delivery are one of the most stressful events both physically and psychosocially among the various events in their life.

For Sjostrom (2004) the stronger predictors of well-being are the level of well-being at the beginning of pregnancy and the women’s degree of SOC. A high SOC does not prevent decreased well-being but rather is sign of good adaptation to the situation. A high SOC provides a successful way of dealing with stressful situations and influences emotional response to those situations.

When we analyse through multiple linear regression what the main contributing factors to depression are at the three moments of evaluation, we observe that depression in the beginning of pregnancy was mainly predicted by Total ALPHA, sense of coherence and immigrant situation. So clearly immigrant women with a low sense of coherence, and a high level of identifiable risk factors evaluated by ALPHA, were already more depressed in the beginning of pregnancy.

About depression in the end of pregnancy we could conclude that the main predictors of the level of depression were mother’s sense of coherence and father’s age. Women with a lower sense of coherence in the end of pregnancy and which husbands were younger were more depressed in the end of pregnancy.
Sense of coherence is an important protective factor and plays a relevance role in the psychological adaptation of women during pregnancy.

5.3. PREGNANT WOMEN SUBGROUPS

To understand if we have in this population subgroups of women at high mental and parental risk, that should increase our concern and should justify special interventions, we grouped the most relevant results according to the most significant risk predictors: immigrant situation, mother’s age, marital status, years of education, depression and sense of coherence. To describe these groups at risk we will primarily rely on the outcomes from correlation and univariate linear regression analyses (section 4.2) and also from the multiple linear regression analyses (section 4.3).

Immigrants
Immigrant women are 40% of the sample from the Amadora region. Comparing socio-demographic characteristic between non-immigrants, first and second immigrant generation, we observed a higher rate of single or divorced women in the second generation of immigrant women, but the total number of pregnant women evaluated in this category was only 5. Apart from these differences the groups are similar in the other socio-demographic characteristics. They have a higher level of family risk factors, but not more global risk as measured by ALPHA. Women with a foreign nationality, thus being immigrant and especially in second generation have increased levels of depression in the beginning of pregnancy, a higher level of psychopathology, but no differences in sense of coherence or maternal-fetal attachment. The children of Immigrant mothers show less responsiveness, but at the other hand non-Portuguese mothers show lower intrusiveness and hostility towards their babies. One hypothesis is that the impact of immigration on child responsiveness is mediated through the higher level of depression among immigrant mothers. Our data supported this hypothesis.

Years of Education
The number of years of education varies from 0 to 18 with a median of 9. A lower education level is associated with lack of social support, with a couple relationship of risk, lack of prenatal care, risk feelings towards pregnancy, a poorer relationship with their own parents, Family risk factors subtotal, risk of substance abuse, and risk evaluated by Total ALPHA, and it’s one of the main protective factors to psychosocial risk. Education is not associated with the level of depression, minor psychopathology, sense of coherence or maternal-fetal attachment.
A higher level of education is associated with higher maternal sensitivity and with higher child responsivenes. It’s one of the main predictors of child responsiveness and we concluded that for each more year of education the possibility of a greater child’s responsiveness (≥ 5) increases with 18%.

**Marital status**
In this sample 23.9% of the women were single, and 1.1% separated; 75% were married or in living a marital relationship.
Women who are single or divorced have a lower self esteem, a higher family risk and a higher level of psychosocial risk evaluated by ALPHA.
Being single or divorced is associated with a higher level of depression in the beginning and the end of pregnancy, but not 6 months after birth, further with a higher level of minor psychopathology, and with a lower level of sense of coherence in the beginning of pregnancy but not in the end or after delivery.
The children of single or divorced women, have a higher responsivenes. We didn’t found any literature that supports this result and we do not have a straightforward explanation for this outcome. It might be that the absence of a father to respond to, creates a more focused relationship between mother and child, increasing the responsivenes to the mother.
Marital situation has no relation with maternal-fetal attachment neither with other emotional availability dimensions of the mother and child relationship.

**Mother’s age**
Older mothers have a higher level of maternal-fetal attachment and a lower intrusiveness. Adjusted to nationality and level of education, our multiple logistic regression analysis showed that an increase of mothers’ age by one year increases non intrusiveness with 11%, what means that it decreases her intrusiveness to the child.

**Father’s age**
The young age of the fathers is associated with a more problematic couple’ relationship, a mother’s psychiatric history, substance abuse and a higher psychosocial risk in general.
Young fathers are associated with women with a lower sense of coherence, with a later lower maternal fetal attachment, and a lower mother’s structuring.

**Depressed mothers**
38% of the women evaluated with ALPHA, had a depressive mood in pregnancy
Using the cut-off of 12 in EDPS suggested by literature, we can conclude that 20% meet criteria for cases at T1, 7.7% at T2, and 7.9% at T3, so Depression decreased during
pregnancy and becomes stable 6 months after birth. Eight cases have criteria for chronic depression as they are more depressed at both T1, T2, and T3. A high level of Depression in the beginning of pregnancy is positively correlated with less social support, stressful life events, couple relationship of risk, problematic relationship with their parents, low self-esteem, history of psychiatric problems, depression in pregnancy, current or past woman abuse, and subtotal family and maternal ALPHA and Total ALPHA. Depression in the beginning of pregnancy is one of the main predictors of ALPHA. In the end of pregnancy, depression is correlated with stressful life events, problematic feeling toward pregnancy at 20 weeks, history of psychiatric problems, depression in pregnancy, subtotal family and maternal, substance abuse ALPHA and total ALPHA assessed in the beginning of pregnancy. Six months after delivery, depression is correlated with a history of psychiatric problems, depression in pregnancy, subtotal maternal, substance abuse and total ALPHA, all measured at the beginning of pregnancy. More depressed women in the beginning of pregnancy have a lower maternal-fetal attachment, and depression is one of the main predictors of poor maternal-fetal attachment. This association does not exist with depression in the end of pregnancy. Depression in the end of pregnancy decreases later mother’s structuring and increases mother’s hostility. Depressive women have always a lower sense of coherence.

**Sense of coherence**
The mean values of SOC in the three assessments in this study are low to moderate, but increase during pregnancy and after birth. Women with a low sense of coherence are women with a higher psychosocial risk, as it’s associated with less social support, higher risk of stressful life events, couples’ relationship of risk, low self esteem, psychiatric history, previous history of depression, current or past woman abuse, child discipline, Family, Maternal Risk factors, Family Violence and Total ALPHA. A higher SOC is associated with being married or in a marital relationship, and with a higher father’s age. SOC has no association with maternal-fetal attachment neither with emotional availability.

We demonstrated a negative correlation with minor psychopathology in the beginning of pregnancy, and with depression in the 3 moments of assessment. A low SOC in the beginning of pregnancy is one of the main predictors of depression at the same moment. The same predictive value between low SOC and depression exists at the end of pregnancy but not 6 months after delivery. For Family Risk, Maternal Risk, Family Violence and Total Alpha, SOC might have the opposite effect than GHQ, depression and father’s age, which means it might reduce such risks.
SOC measures the capacity to cope with new and stressful events. Both pregnancy and motherhood can be understood as new stressful periods. We agree with the suggestion of Sjostrom et al (2004) that SOC scale should be a regular part of the evaluation of the pregnant woman's need for psychosocial support during pregnancy.

**Women submitted to present or past abuse**

This risk factor is coded in ALPHA as VF2, and seems to be of great relevance, although its impact needs further reflection. Women at risk because they were abused in the past or presently show more maternal-fetal attachment, but their child will have a lower responsiveness.

The question about maternal-fetal attachment and the way these mothers idealize and invest on maternity was discussed before. The correlation of maternal abuse history with a lower child responsiveness might reflect that the interaction of these mothers with their baby won’t be easy and that they have to face difficulties.

**5.4. - IS ALPHA A RELIABLE, VALID AND FEASIBLE INSTRUMENT FOR PHC TO ASSESS PSYCHOSOCIAL RISK FACTORS AND CUMULATIVE PSYCHOSOCIAL RISK DURING PREGNANCY?**

In this study ALPHA proved to be a valid, feasible and reliable instrument. It’s an easy to use instrument, close to clinical work and worries, allowing the observer to detect early risk factors. For the General Practitioners in PHC at Fernão Ferro Unit who contributed to the adaption of the Portuguese version, and for the mental health professionals who collected data for this study, ALPHA was found to be a feasible instrument. The fact that it’s not a very long interview in itself, but creates a comprehensive approach and an opportunity to talk about relevant and sometime troublesome subjects makes it adaptable to clinical reality. The list of strategies to implement when a certain risk factor is detected is a relevant part of the way ALPHA should be used and that will be adapted to our reality.

ALPHA has a long-standing face and content validity demonstrated by Canadian experts as it has been largely used in PHC. Our experience confirmed this validation, based on the opinion of experts in maternal consultation at Fernão Ferro, and later of the mental health professionals who collected data for this study who came to the same conclusion.

In the training of the professionals who collected data, and during the period of collecting data we had regular meetings with the researchers, assuring the same criteria use, discussing differences and standardizing registration.
Construct validity was supported by the strong correlation with other variables as depression, minor psychopathology and sense of coherence.

For the ALPHA total we obtained a Cronbach alpha of .721, which shows a satisfactory reliability. We also computed Cronbach Alpha for each subscale excepting substance abuse as it has only one item. We obtained a value of .561 for subtotal Family Factors, a value of .384 for subtotal Maternal Factors, and a value of .572 for Subtotal Family Violence. This means that the subscales, mainly because their limited number of items, have a low level of reliability. This means that the results from our study on correlations with the subscales and individual items of ALPHA should be treated with prudence.

This is the first study using a total score of ALPHA risk factors, defined as the sum of the coded values of the different questions on risk factors. In our opinion, it’s an important contribution as total ALPHA reflects the idea that the relevance of risk or protective factors does not lie in the isolated existence of each factor, but in the total number of risk factors (i.e. cumulative effect), and the balance between risk and protective factors. That does not contradict the need to analyze each risk or protective factor separately in a particular woman, while that informs us about the need to implement specific measures to reduce that risk factor or to strengthen specific protective factors.

This sum, Total ALPHA, doesn’t have a valid cut-off score, but the sum score allows us to compare different groups at their level of psychosocial risk, and to study the antecedents and outcomes of high risk levels in research.

In this study, Total ALPHA has demonstrated to be strongly correlated with depression, sense of coherence and minor psychopathology, in the beginning of pregnancy and also with depression in the end of pregnancy and six months after birth.

5.5. STRENGTHS OF THE STUDY

This is the first study in Portugal using the ALPHA and introducing an instrument to assess psychosocial risk, adapted to Primary Health Care. It clearly demonstrated that ALPHA is strongly correlated with socio-demographic factors and with depression, minor psychopathology and sense of coherence. We also demonstrated that it can be used as a total score reflecting the level of cumulative risk.

The study also contributed to a better knowledge of the population living in this area, allowing us to better understand a fragile, high risk population that tries to adapt to difficult conditions. The study points at malleable determinants that can be strengthened such as, for instance the education level, social support, early detection of pregnancy and access to prenatal care.
It’s a longitudinal study that assesses women during all pregnancy until six months after birth, correlating mental health dimensions and risk factors in pregnancy with mother–fetus attachment and later mother-baby interaction.
We think it’s one of the few studies in Portugal using the Emotional Availability Scales.
It also reinforces the relevance of sense of coherence, as a protective factor in pregnancy and after a child is born, acting as a buffer for other risk factors.

It’s a study that is based in the ecological model of Belsky, evaluating different determinants of mother-baby relationship, and the basis to a future intervention Programme on Mental Health Promotion. As Belsky suggested we have introduced the interaction between more proximal and more distal factors.

The offered insight in risk and protective factors during pregnancy and early life offers perspectives for actions that could contribute to better cognitive, emotional and behavioural development of the children living in at risk areas such as the Amadora community. The identification of certain subpopulations who are especially at high risk makes it possible to develop a targeted and efficient mental health promotion policy and practice.

5.6. WEAKNESSES OF THE STUDY

One the weaknesses of this study, is the limited size of our sample which have narrowed the opportunities to find significant results in our statistical analysis. Especially in some variables the n is small, limiting the possibility to draw conclusions about their role.
We had a high number of dropouts of women who had changed their contacts, remaining impossible to contact, or who returned to their origin countries.
As was discussed before, we think that the Maternal-Fetal Attachment Scale has some limitations as it is based on mother’s representations and expectative to the child to born. According to its nature, MFA is something we cannot observe directly, and can only be evaluated based in what the mother reports.
We admit that interactions between different factors could explain some of non significant results and that later research could highlight these questions. We can also suppose that other factors that have not been evaluated could explain some of the results, such as the existence of a strong social network, and the influence of a structured neighbourhood or social capital.
5.7. CONSEQUENCES FOR HEALTH POLICY

Notwithstanding the cited limitations, the results of the present study should have implications on national and local social and health Policies namely:
- Reinforcement of the strategies to integrate immigrants, especially pregnant and young mothers.
- Reinforcement of the level of education in women, what many times is associated with the real possibility of delaying pregnancy to older ages and of preventing pregnancies at a very young age.
These two issues are closely related with the improvement of local Health Indicators in maternal and child health that we know are worrying in this population.

On Health Policies and more specifically for Primary Health Care we propose the following recommendations:
- The use of ALPHA in routine maternal health consultation, in the beginning of pregnancy associated with EDPS and SOC. The use of ALPHA would allow us to early detect risk in order to implement strategies to reduce risk or its impact or to develop strategies to strengthen protective factors, utilizing the existent resources.
- EDPS is already largely used in PHC, and we think it’s important to keep on using it, as depression has an important impact on MFAS and in some dimensions of EAS. This assessment is relevant as we know that beginning the treatment as early as possible will prevent other problems and difficulties.
- We would also recommend that in women who are in special risk of depression as immigrant or living alone, SOC should be measured in pregnancy as we know that it is a relevant protective factor.
- Strengthen the role of couple relationship in mental health development of pregnant women, paying special attention to women who are alone or when the couple is very young.

5.8. NOT ANSWERED QUESTIONS AND FUTURE RESEARCH

This study raises some questions for future studies, namely the meaning of MFAS, as it seems to be a subjective concept influenced by mother’s expectations and desire of social acceptability. We propose the repetition of the correlation analysis we have done using another scale to measure MFAS like the Prenatal Attachment Inventory or the Maternal-Fetal
Attachment Inventory as more recently studies had more encouraging results (Chen et al 2013),

Cultural differences in EAS should be investigated, as we would like to understand if our results are strongly influenced by cultural circumstances and differences or not. This would offer an excellent contribution about the knowledge of EA and its possible dependency to social and cultural context.

In another study, it would be also of interest, to clarify to the relationship between Total ALPHA, depression and hostility in EAS, and also the correlation between depression in the end of pregnancy and non-hostility and structuring. It would be important to better understand if depression in pregnancy is a mediator mechanism, or one more risk factor, that increases the risk of hostility to the child.
PART II
ORIGINAL RESEARCH

CHAPTER 6
CONCLUSIONS
CONCLUSIONS

From this study, several conclusions arise:

- ALPHA proved to be a valid, feasible and reliable instrument, close to clinicians work, their worries and needs, allowing the observer to detect early in pregnancy psychosocial risk factors. This offers better opportunities for timely preventive action. The list of options for a follow-up plan or referrals must be adapted to Portuguese reality. The other relevant conclusion is its use as a total score, as we concluded how relevant is the sum and interaction of different risk factors. Total ALPHA has been clearly correlated with depression (in the beginning, in the end of pregnancy and 6 months after birth), with minor psychopathology and sense of coherence, but not with maternal-fetal attachment, neither with emotional availability. There exists strong evidence in the scientific literature that maternal depression early in the child’s life has a strong negative impact on the social-emotional development of the child and later adolescent. Using the ALPHA during pregnancy offers new opportunities to address maternal depression and its risk factors in an early stage.

- The study has increased our knowledge about this particular population living in a multicultural community such as the Amadora region, and contributes to the identification of specific groups at high risk, that should be the target of intervention programmes. Some pregnant women seem to be particular vulnerable, particularly when risk factors are present or when protective factors does not exist, or are not sufficiently powerful. This is the case for pregnant women who are single or divorced, still very young, immigrant, with a low education level, or a combination of these risk factors.

  Young mother’ age is associated with couple’s relationship of risk, low maternal-fetal attachment and higher intrusiveness to the baby. Becoming pregnant at a young age will have a strong impact on her education, as the majority will end their studies. In turn, a lower education is associated with a higher psychosocial risk, lower maternal sensitivity and lower child responsiveness.

  Immigrant mothers don’t have a higher psychosocial risk, but are more depressed in the beginning of pregnancy, what is a relevant predictor of poor maternal-fetal attachment. They are less intrusive and less hostile than non-immigrant mothers but their children are less responsive. Six months after birth they are more depressed what is correlated with a higher hostility.
We can also conclude that according to this study, pregnant women that are depressed, and have higher levels of minor psychopathology or low sense of coherence, are also more vulnerable.

In what concerns the impact of the family structure, pregnant women who are single or divorced have a higher psychosocial risk, are more depressed and have more minor psychopathology in the beginning of pregnancy what reinforces risks later in pregnancy and after birth. They have also a lower sense of coherence, limiting a buffer effect on the development of depression. Depression will predict lower maternal-fetal attachment; they continue to have a higher probability of being depressed in the end of pregnancy what is associated with a lower structuring in the interaction with the baby.

Father’s age is also relevant signalling while a higher father’s age seems to be associated with a higher maturity in the relationship and representing a strong protective factor, as it decreases psychosocial risk, increases maternal-fetal attachment, decreases the risk of depression in the end of pregnancy and six months later. It also increases mother’s structuring to the baby. Having a very young partner increases the risk of negative outcomes during pregnancy and the first half year after birth.

- The hypothesis that psychosocial risk is directly correlated with maternal-fetal attachment and that maternal-fetal attachment is directly correlated with emotional availability was not confirmed, neither the correlation between prenatal psychosocial risk and maternal emotional availability. We can speculate that such causal relations might only be present in certain subgroups or under certain conditions. This would require further interaction analysis of the data. For instance, it could be possible that high psychosocial risk will only result in poor maternal-fetal attachment and lack of emotional availability when mothers missing protective factors such as a sense of coherence, high scholarity and being married.

- In spite of the high psychosocial risk detected in the beginning of pregnancy, we observed that the levels of depression in the end of pregnancy and 6 months after birth are lower than usual, decreasing from the beginning of pregnancy. At the same time, we observed that sense of coherence, that has a low mean value in the beginning of pregnancy, progressively increases during pregnancy and 6 months after birth.

Our interpretation or hypothesis is that pregnancy can be considered a maturational process and an opportunity to change, and that adaptation processes could occur, buffering risk, decreasing depression and increasing sense of coherence. According to
our theoretical framework, sense of coherence is associated with resilience, and pregnancy could act as an opportunity and stimulus to these women, to improve sense of coherence.

We don't know if this improvement in sense of coherence, associated with a decrease in depression, is associated with internal factors, corresponding to a process of maturation in women, using an opportunity full of hope to change, or with external factors, as a positive reaction from her family, neighbourhood or health care system helping the women to adapt to this new reality.

- Another relevant conclusion of this study is the relevance of depression in pregnancy and its association with marital status, migrant situation and psychosocial risk, and its later impact on maternal-fetal attachment and in some dimensions of emotion availability, namely structuring and non-hostility.

This result can be an important contribution to the understanding of the impact of depression in mother-child relationship and in the way hostility emerges in the interaction.

- The study raises also some doubts or questions for that need further research. This applies especially to the value of the concept and measurement of maternal-fetal attachment and to the hypotheses about its determinants and impact. Maternal-fetal attachment seems to be a subjective concept that might be influenced by mother's expectations and desire of social acceptability, which in turn could be affected by experiences of abuse and a lack of a supportive partner. In addition, it is yet unclear how differences in cultural background could influence views about motherhood and the interaction between mothers and babies early in life. Finally, it is yet unclear which of the existing measures of maternal-fetal attachment are most valid and able to predict later mother-child interaction.

The study highlights the relevance of sense of coherence as a potential protective factor while it is strongly and negatively related with a wide range of risk factors and mental health outcomes especially depression before, during and after pregnancy. We did not find a relationship with maternal-fetal attachment and neither with emotional availability. It might be that sense of coherence directly works as a positive strength that increases mental health and prevents depression and other psychopathology. It also might serve as a buffer preventing that present risk factors will lead to depression. These interpretations would require further interaction analyses between all involved factors. It also might be possible that sense of coherence is indirectly influencing the mother-child interaction through its impact on depression, and maternal depression impacts emotional availability.
- **Recommendations**

Taking into account these conclusions, the following recommendations arise from this study:

- We advocate the regular use of ALPHA in Primary Health Care, in the beginning of pregnancy together with the application of EDPS and SOC. The use of ALPHA would allow us to early detect the level of risk and the presence of specific risk factors, and to implement strategies to reduce risk or its impact, or to develop strategies to strengthen protective factors, utilizing the existent resources. It might also stimulate the development or adaption of new effective preventive interventions. EDPS is already largely used, and this study reinforces its use as a way to diagnose and treat Depression the soon as possible.

We think that it’s helpful to also evaluate SOC in the beginning of pregnancy, especially in women who are depressed or having minor psychopathology, or that are more vulnerable while living alone, being immigrant, having a lower level of education or a higher psychosocial risk due to a combination of risk factors. This should be accompanied with efforts to make intervention that could increase sense of coherence more available.

- We recommend further research on the concept, measurement and role of Maternal-Fetal Attachment. We cannot yet recommend the use of the concept of MFA and the MFAS in Primary Health Care. The results of our study stress that the value and role of MFA is not yet sufficiently understood and its use can easily introduce in clinicians a wrong and tranquilizing idea that there is a good attachment between mothers and fetus, while this attachment might be fed by negative and traumatic experiences. We observed contradictory results, namely the association between current or past women abuse and a higher MFA, and also that more depressed women in the beginning of pregnancy have a lower MFAS but that the same correlation does not persist to the end of pregnancy. This raises the question about the real value of MFAS, and the way the answers of this scale are influenced by women' hopes, expectancies and wish of social desirability.

- At a political level we recommend the reinforcement of Immigrant integration and the increment of education in women. Immigrant women have a higher risk of depression what will be associated with lower maternal-feral attachment and with a lower responsiveness of their babies. A higher level of education in women is associated with lower psychosocial risk, and has a significant impact on emotional availability increasing maternal sensitivity and child responsiveness.
We recommend more focus in health care and public health at the mental health condition and psychosocial risk of specific groups at high risk. In Primary Health Care special attention should be paid to women who are single or divorced, very young, low educated women and Immigrant mothers. This study provide the basis to an intervention programme with this population, intervening in a broad spectrum risk factors as can be observed in II.6.1 Promoting Mental Health in women who become pregnant. For that reason, it is of great importance to increase the availability and access to effective preventive and health promotion interventions, which are also cost-effective. This could be enhanced by the development of a National database of such interventions and the provision of training programs for health care and public health providers to increase their capacity in providing such interventions. Internationally a growing spectrum of such interventions have become available, targeting depressed mothers, abused mothers and children of parents suffering from depression or other serious problems. The same applies to interventions that successfully help to increase the resilience, parenting capacity, coping capacity and the emotional and social empowerment of parents. Health and mental health policies should facilitate the implementation of the suggested measures.

**Figure II.6.1 – Mental Health Promotion**
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APPENDIX 1

INFORMED CONSENT
CONSENTIMENTO INFORMADO

Gostávamos de lhe pedir autorização para a recolha de forma anónima de alguns dados relacionados com a sua situação clínica e história pessoal.
Irá responder a algumas questões e os dados obtidos serão confidenciais, mas poderão ser publicados posteriormente, sem revelar a sua identidade.
Ao participar irá contribuir para a melhoria da qualidade do acompanhamento de outras grávidas.
Com a assinatura deste documento irá dar-nos voluntariamente autorização para a recolha dessa informação.

Agradecemos todo o tempo dedicado na sua colaboração

Assinatura ____________________________________________________________

Data ___/___/___
CONSENTEÍMOMO INFORMADO

Gostávamos de lhe pedir autorização para a recolha de forma anónima de alguns dados relacionados com a sua situação clínica e história pessoal.

Irá responder a algumas questões e os dados obtidos serão confidenciais, mas poderão ser publicados posteriormente, sem revelar a sua identidade.

Queremos também saber como é que está a sua relação com o seu bebé, o que irá ser feito através de um registo em filme da interacção dos dois. Este filme será apenas utilizado para esta investigação, sendo-lhe posteriormente entregue uma cópia.

Ao participar irá contribuir para a melhoria da qualidade do acompanhamento de outras grávidas.

Com a assinatura deste documento irá dar-nos voluntariamente autorização para a recolha de informação e para a realização deste filme.

Agradecemos todo o tempo dedicado na sua colaboração.

Assinatura

Data ___/___/___
APPENDIX 2

SOCIO-DEMOGRAPHIC QUESTIONNAIRE
<table>
<thead>
<tr>
<th>Nome</th>
<th>Data de Nascimento</th>
<th>C. de Saúde</th>
<th>Processo nº</th>
<th>Médico</th>
<th>Enfermeiro</th>
<th>Morada</th>
<th>Naturalidade</th>
<th>Telefone fixo</th>
<th>Telemóvel</th>
<th>Data da última menstruação</th>
<th>Emigrante</th>
<th>1ª</th>
<th>2ª</th>
<th>geração</th>
<th>Profissão do pai</th>
<th>Idade do Pai</th>
<th>Avaliação I</th>
<th>realizada por</th>
<th>Data de Parto</th>
<th>Sexo bebé</th>
<th>Local do Parto</th>
<th>Tipo de Parto</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Damai</td>
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<td>2</td>
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<td><strong>/</strong>/__</td>
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</tr>
</tbody>
</table>

1. Estado civil:
- Solteira/o
- Casada/o
- Vive maritalmente
- Separada/o
- Divorciada/o
- Viúva/o
- Outro

6. Local de Residência:
- Andar apartamento
- Habitação precária
- Moradia
- Quarto/parte de casa

7. Bairro de residência:
- Bairro residencial
- Bairro camarário
- Bairro de barracas
- Bairro degradado
- Outro

8. Condição perante o trabalho:
- Estudante
- Dona de casa
- Trabalhador por conta d’outrém
- Trabalhador por conta própria
- Trabalhador independente
- Patrão
- Desempregado
- Reforma

9. Profissão (actual ou das anteriores, aquela que foi exercida durante mais tempo):

10. Actividade profissional principal actualmente:

11. Há quantos anos trabalha nesta actividade?

12. Número médio de horas semanais - todas as actividades profissionais

13. Quanto tempo gasta por dia em deslocações de e para o seu local de trabalho: minutos/dia
APPENDIX 3

ANTENATAL PSYCHOSOCIAL HEALTH ASSESSMENT
Avaliação da saúde psico-social pré-natal (ALPHA) *

Os problemas psicosociais que decorrem no período pré-natal podem estar associados a consequências negativas no pós-parto. As questões que fazem parte deste questionário são sugestões de como averiguar a saúde psico-social. As questões de elevado grau de preocupação para a mulher, para a sua família ou para o cuidador geralmente indicam a necessidade de suporte ou serviços suplementares. Quando algumas preocupações são identificadas, deve-se considerar a necessidade de reavaliação e/ou referência posterior. Informação complementar pode ser obtida no Manual do ALPHA. * Por favor considere a delicadeza desta informação antes de a partilhar com outros cuidadores.

Nome ____________________________
Nº _____ Data / /

<table>
<thead>
<tr>
<th>FACTORES PRÉ-NATAIS</th>
<th>PREOCUPAÇÃO</th>
<th>OBSERAÇÕES/PLANO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Apoio social (AC, AM, DP)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Como é que o seu companheiro/a sua família se sentem em relação à sua gravidez?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quem irá ajudá-la quando voltar para casa com o seu bebé?</td>
<td>☐ Baixa</td>
<td></td>
</tr>
<tr>
<td>☐ Razoável</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Elevada</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **Acontecimentos de vida stressantes ocorridos recentemente (AC, AM, DP, DF)** |
| Que mudanças na sua vida ocorreram ao longo deste ano? |
| Que mudanças tem estado a planear durante esta gravidez? | Baixa | | |
| ☐ Razoável | | |
| ☐ Elevada | | |

| **Relacionamento conjugual (DC, DP, AM, AC)** |
| Como descreve o seu relacionamento com o seu companheiro? |
| Como pensa que será o vosso relacionamento depois do nascimento? | ☐ Baixa | | |
| ☐ Razoável | | |
| ☐ Elevada | | |

<table>
<thead>
<tr>
<th>FACTORES MATERNOS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cuidados pré-natais (iniciados tardiamente) (AM)</strong></td>
</tr>
<tr>
<td>Primeira visita pré-natal no terceiro trimestre? (ver registos)</td>
</tr>
<tr>
<td>☐ Razoável</td>
</tr>
<tr>
<td>☐ Elevada</td>
</tr>
</tbody>
</table>

| **Educação pré-natal (recusa ou abandono) (AC)** |
| Quais são as suas intenções em relação às aulas de preparação para o nascimento? | Baixa | | |
| ☐ Razoável | | |
| ☐ Elevada | | |

| **Sentimentos em relação à gravidez após as 20 semanas (AC, AM) de gestação** |
| Como é que se sentiu quando soube que estava grávida? |
| Como é que se sente agora em relação a este assunto? | ☐ Baixa | | |
| ☐ Razoável | | |
| ☐ Elevada | | |

| **Relacionamento com os pais durante a infância (AC)** |
| Como foi o seu relacionamento com os seus pais? |
| Sentiu-se amada pelos seus pais? | ☐ Baixa | | |
| ☐ Razoável | | |
| ☐ Elevada | | |

| **Auto-estima (AC, AM)** |
| Quais são as suas preocupações sobre ser e tornar-se mãe? | ☐ Baixa | | |
| ☐ Razoável | | |
| ☐ Elevada | | |

| **História de problemas psiquiátricos/emocionais (AC, AM, DP)** |
| Já alguma vez teve problemas emocionais? |
| Já alguma vez consultou um psiquiatra ou psicólogo? | ☐ Baixa | | |
| ☐ Razoável | | |
| ☐ Elevada | | |

| **Depressão durante a gravidez (DP)** |
| Como tem estado o seu humor durante esta gravidez? | ☐ Baixa | | |
| ☐ Razoável | | |
| ☐ Elevada | | |
RESULTADOS ASSOCIADOS NO PÓS-PARTO

Os factores pré-natais na coluna da esquerda estão associados a consequências no pós-parto (assinaladas entre parêntesis): **negrito, itálico** indica uma boa evidência desta associação; texto regular indica baixa evidência desta associação.  

AC – Abuso da Criança  
DC – Disfunção do Casal  
DF – Doença Física  
DP – Depressão Pós-parto  
AM – Abuso da Mulher

<table>
<thead>
<tr>
<th>CONSUMO DE SUBSTÂNCIAS</th>
<th></th>
</tr>
</thead>
</table>
| Abuso de Álcool/Drogas (AM, AC) | □ Baixa  
□ Razoável  
□ Elevada |
| Quantas bebidas alcoólicas bebe por semana? |  |
| Há momentos em que bebe mais do que isso? |  |
| Costuma consumir drogas de forma recreativa? (a grávida ou o seu companheiro) |  |
| Tem problemas com álcool ou drogas? (a grávida ou o seu companheiro) |  |
| Considere o grau de dependência alcoólica “CAGE” |  |

<table>
<thead>
<tr>
<th>VIOLÊNCIA FAMILIAR</th>
<th></th>
</tr>
</thead>
</table>
| Grávida ou companheiro vítimas ou testemunhas de abuso (físico, emocional, sexual) (AC, AM) | □ Baixa  
□ Razoável  
□ Elevada |
| Como era a relação entre os seus pais? |  |
| Alguma vez o seu pai intimidou ou magoou a sua mãe? |  |
| Alguma vez os seus pais a/o intimidaram ou a/o magoaram? |  |
| Foi abusada/o sexualmente em criança? |  |

| Abuso da Mulher no passado ou no presente (AM, AC, DP) | □ Baixa  
□ Razoável  
□ Elevada |
| De que forma é que você e o seu companheiro gerem em geral os conflitos? |  |
| Alguma vez se sentiu assustada por aquilo que o seu companheiro lhe disse ou fez? |  |
| Alguma vez o seu companheiro lhe bateu/ empurrou/esbofeteou? |  |
| Alguma vez o seu companheiro a humilhou ou abusou de si psicológicamente de alguma forma? |  |
| Alguma vez se sentiu forçada a ter relações sexuais contra a sua vontade? |  |

| Abuso da criança por parte da mulher ou do companheiro (AC) | □ Baixa  
□ Razoável  
□ Elevada |
| Têm filhos que não vivem convosco? (a grávida e o seu companheiro) |  |
| Se sim, porquê? |  |
| Alguma vez esteve envolvida nalgum processo de ligado a protecção de menores? (Comissão de Protecção de Menores) |  |

| Educação/Disciplina em criança (AC) | □ Baixa  
□ Razoável  
□ Elevada |
| Como foi educada/castigada em criança? |  |
| Como pensa educar/castigar os seus filhos? |  |
| Como lida com os seus filhos em casa quando eles se portam mal? |  |

<table>
<thead>
<tr>
<th>PLANO DE REAVALIAÇÃO</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Aconselhamento prestado por especialista</td>
<td>□ Cuidados domiciliários</td>
</tr>
<tr>
<td>□ Consultas pré-natais adicionais</td>
<td>□ Curso de Preparação para o nascimento</td>
</tr>
<tr>
<td>□ Consultas pós-parto adicionais</td>
<td>□ Programas de tratamento de comportamentos aditivos</td>
</tr>
<tr>
<td>□ Visitas adicionais na área do bem-estar do bebé</td>
<td>□ Programa de cessação tabágica</td>
</tr>
<tr>
<td>□ Serviços de Educação pré-natal</td>
<td>□ Assistente social</td>
</tr>
<tr>
<td>□ Nutricionista</td>
<td>□ Psicólogo/Psiquiatra</td>
</tr>
<tr>
<td>□ Recursos na comunidade/Grupos de auto-ajuda para a mãe</td>
<td>□ Psicoterapeuta/Terapeuta de casal e/ou familiar</td>
</tr>
<tr>
<td>□ Linha de apoio à vítima/ Abrigo/ Aconselhamento</td>
<td></td>
</tr>
<tr>
<td>□ Apoio Legal/Jurídico</td>
<td>□ Comissão de Protecção de menores</td>
</tr>
<tr>
<td>□ Outro: ___________________</td>
<td>□ Outro: ___________________</td>
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<td>□ Outro: ___________________</td>
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</tr>
</tbody>
</table>
APPENDIX 4

EDINBURGH POSNATAL DEPRESSION SCALE
**ESCALA DE DEPRESSÃO PÓS-PARTO DE EDIMBURGO (EDPS)**

Nome ________________________________ N º   __   Fase I   II   III

Data_/__/___   ___ Semanas de gravidez/   Idade do Bebé_______   Pontuação__________

Dado que teve um bebé há pouco tempo, gostaríamos de saber como se sente. Por favor sublinhe a resposta que mais se aproxima dos seus sentimentos nos últimos 7 dias. Obrigado.

<table>
<thead>
<tr>
<th>1. Tenho sido capaz de me rir e ver o lado divertido das coisas</th>
<th>6. Tenho sentido que são coisas demais para mim</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanto como dantes</td>
<td>Sim, a maioria das vezes não consigo resolvê-las.</td>
</tr>
<tr>
<td>Menos do que dantes</td>
<td>Sim, por vezes não tenho conseguido resolvê-las como antes</td>
</tr>
<tr>
<td>Muito menos do que dantes</td>
<td>Não, a maioria das vezes resolvo-as facilmente</td>
</tr>
<tr>
<td>Nunca</td>
<td>Não, resolvo-as tão bem como antes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Tenho tido esperança no futuro</th>
<th>7. Tenho-me sentido tão infeliz que durmo mal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanta como sempre tive</td>
<td>Sim, quase sempre</td>
</tr>
<tr>
<td>Menos do que costumava ter</td>
<td>Sim, por vezes</td>
</tr>
<tr>
<td>Muito menos do que costumava ter</td>
<td>Não, raramente</td>
</tr>
<tr>
<td>Quase nenhuma</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Tenho-me culpado sem necessidade quando as coisas correm mal</th>
<th>8. Tenho-me sentido triste ou muito infeliz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sim, a maioria das vezes</td>
<td>Sim, quase sempre</td>
</tr>
<tr>
<td>Sim, algumas vezes</td>
<td>Sim, muitas vezes</td>
</tr>
<tr>
<td>Raramente</td>
<td>Raramente</td>
</tr>
<tr>
<td>Não, nunca</td>
<td>Nunca</td>
</tr>
</tbody>
</table>

| 4. Tenho estado ansiosa ou preocupada sem motivo               | 9. Tenho-me sentido tão infeliz que choro    |
|                                                               | Sim, quase sempre                           |
|                                                               | Sim, muitas vezes                           |
|                                                               | Só às vezes                                 |
|                                                               | Não, nunca                                  |

| 5. Tenho-me sentido com medo ou muito assustada, sem motivo    | 10. Tive ideais de fazer mal a mim mesma     |
|                                                               | Sim, muitas vezes                           |
|                                                               | Por vezes                                   |
|                                                               | Muito raramente                             |
|                                                               | Nunca                                       |
APPENDIX 5

GENERAL HEALTH QUESTIONNAIRE
Nome ________________________________________________________ data ___/__/__
C. Saúde ________   Nº ___________

Leia, por favor, as perguntas que se seguem e as quatro respostas possíveis para cada uma. Gostaríamos de saber, de uma maneira geral, como tem estado a sua saúde nas últimas quatro semanas. Por favor, responda a todas as perguntas, assinalando com um círculo a resposta que melhor se aplica a si.

Recentemente,

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1. tem-se sentido capaz de se concentrar nas coisas que está a fazer?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melhor que o habitual</td>
<td>Aproximadamente o mesmo</td>
<td>Pior que o habitual</td>
<td>Muito pior que o habitual</td>
</tr>
<tr>
<td>2. as suas preocupações têm-lhe feito perder o sono?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Não, de modo nenhum</td>
<td>Não mais do que o habitual</td>
<td>Bastante mais que o habitual</td>
<td>Muito mais do que o habitual</td>
</tr>
<tr>
<td>3. tem sentido que desempenha um papel importante nas coisas da sua vida?</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Mais do que o habitual</td>
<td>Aproximadamente o mesmo</td>
<td>Menos que o habitual</td>
<td>Muito menos que o habitual</td>
</tr>
<tr>
<td>4. tem-se sentido capaz de tomar decisões?</td>
<td></td>
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<td></td>
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<tr>
<td>Mais do que o habitual</td>
<td>Aproximadamente o mesmo</td>
<td>Menos que o habitual</td>
<td>Muito menos que o habitual</td>
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<tr>
<td>5. tem-se sentido permanentemente sob tensão?</td>
<td></td>
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<td></td>
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<tr>
<td>Não, de modo nenhum</td>
<td>Não mais do que o habitual</td>
<td>Bastante mais que o habitual</td>
<td>Muito mais do que o habitual</td>
</tr>
<tr>
<td>6. tem-se sentido incapaz de ultrapassar as suas dificuldades?</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Não, de modo nenhum</td>
<td>Não mais do que o habitual</td>
<td>Bastante mais que o habitual</td>
<td>Muito mais do que o habitual</td>
</tr>
<tr>
<td>7. tem conseguido sentir gosto nas tarefas normais de cada dia?</td>
<td></td>
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<td></td>
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<tr>
<td>Mais que o habitual</td>
<td>Igual ao habitual</td>
<td>Menos que o habitual</td>
<td>Muito menos que o habitual</td>
</tr>
<tr>
<td>8. tem-se sentido capaz de enfrentar os seus problemas?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mais que o habitual</td>
<td>Igual ao habitual</td>
<td>Menos que o habitual</td>
<td>Muito menos que o habitual</td>
</tr>
<tr>
<td>9. tem-se sentido infeliz ou deprimido(a)?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Não, de modo nenhum</td>
<td>Não mais do que o habitual</td>
<td>Bastante mais que o habitual</td>
<td>Muito mais do que o habitual</td>
</tr>
<tr>
<td>10. tem perdido a confiança em si próprio(a)?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Não, de modo nenhum</td>
<td>Não mais do que o habitual</td>
<td>Bastante mais que o habitual</td>
<td>Muito mais do que o habitual</td>
</tr>
<tr>
<td>11. tem pensado em si como uma pessoa sem valor nenhum?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Não, de modo nenhum</td>
<td>Não mais do que o habitual</td>
<td>Bastante mais que o habitual</td>
<td>Muito mais do que o habitual</td>
</tr>
<tr>
<td>12. tem-se sentido razoavelmente feliz, tomando tudo em linha de conta?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mais do que o habitual</td>
<td>Igual ao habitual</td>
<td>Menos do que o habitual</td>
<td>Muito menos do que o habitual</td>
</tr>
</tbody>
</table>
Pedimos a sua colaboração no preenchimento deste suplemento. A sua colaboração na resposta às perguntas que se seguem vai ajudar a compreender melhor a importância que assume o sentido de coerência para a saúde.

As suas respostas são confidenciais.

1. Preencha estas folhas respondendo sinceramente a cada pergunta marcando com uma X a opção que na sua opinião for correcta.

2. Coloque-as depois no envelope que lhe foi fornecido.

3. Pode - mas não é necessário - por o seu endereço no envelope.

4. Deixe-o na caixa ou numa caixa do correio, ou, aguarde pela passagem do entrevistador que procederá à sua recolha.

Obrigado pela sua colaboração.

Saboga Nunes, 1999 ENSP-UNL, versão portuguesa validada para uma amostra de 643 indivíduos. $\alpha$C= entre 0.83 e 0.90 ; $r = 0.88$

in [http://www.salutogenesis.net](http://www.salutogenesis.net) contacto [saboga@salutogenesis.net](mailto:saboga@salutogenesis.net)

Itens a inverter 1, 4, 5, 6, 7, 11, 13, 14, 16, 20, 23, 25, 27 escala de 13 itens 4, 5, 6, 8, 9, 12, 16, 19, 21, 25, 26, 28, 29

<table>
<thead>
<tr>
<th>Item</th>
<th>Question</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Quando fala com outras pessoas, tem o sentimento de que elas não o compreendem?</td>
<td>nunca tenho esse sentimento</td>
</tr>
<tr>
<td>2</td>
<td>No passado, quando teve de fazeralguma coisa que dependia da cooperação de outras pessoas, tinha o sentimento de que as coisas não iriam ser feitas</td>
<td>de que as coisas não iriam ser feitas</td>
</tr>
<tr>
<td>3</td>
<td>Pense nas pessoas com quem contacta diariamente (que não sejam aquelas que lhe são mais chegamadas). Até que ponto é que as sente como pessoas estranhas</td>
<td>que as sente como pessoas estranhas</td>
</tr>
<tr>
<td>4</td>
<td>Tem o sentimento de que não se interessa pelo que se passa à sua volta?</td>
<td>muito raramente</td>
</tr>
<tr>
<td>5</td>
<td>Já lhe aconteceu no passado ter ficado surpreendido pelo comportamento de pessoas que julgava conhecer bem?</td>
<td>nunca aconteceu</td>
</tr>
<tr>
<td>6</td>
<td>Já lhe aconteceu ter sido desapontado por pessoas com quem contava?</td>
<td>nunca aconteceu</td>
</tr>
<tr>
<td>7</td>
<td>A vida é:</td>
<td>cheia de interesse</td>
</tr>
<tr>
<td>8</td>
<td>Até hoje, na vida,</td>
<td>não conseguiu um projecto e um rumo</td>
</tr>
<tr>
<td>9</td>
<td>Tem o sentimento de que não é tratado/a com justiça?</td>
<td>muito frequentemente</td>
</tr>
<tr>
<td>Item</td>
<td>Questão</td>
<td>Opções</td>
</tr>
<tr>
<td>------</td>
<td>-------------------------------------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>1.0</td>
<td>Nos últimos dez anos a sua vida tem sido</td>
<td>cheia de mudanças sem ser capaz de prever o que vem a seguir</td>
</tr>
<tr>
<td>1.1</td>
<td>A maior parte das coisas que irá fazer (no futuro) serão provavelmente</td>
<td>completamente fascinantes</td>
</tr>
<tr>
<td>1.2</td>
<td>Tem sentido muitas vezes que se encontra numa situação pouco habitual, sem saber o que fazer?</td>
<td>acontece sempre</td>
</tr>
<tr>
<td>1.3</td>
<td>Indique o que melhor descreve a sua maneira de ver a vida</td>
<td>consegue-se sempre encontrar uma solução para as coisas dolorosas da vida</td>
</tr>
<tr>
<td>1.4</td>
<td>Quando reflecte sobre a sua vida, frequentemente</td>
<td>sente como é bom viver</td>
</tr>
<tr>
<td>1.5</td>
<td>Quando enfrenta algum problema difícil, a escolha da solução é</td>
<td>sempre confusa e difícil de encontrar</td>
</tr>
<tr>
<td>1.6</td>
<td>Aquilo que faz diariamente é</td>
<td>uma fonte de profunda satisfação e prazer</td>
</tr>
<tr>
<td>1.7</td>
<td>A sua vida futura será provavelmente</td>
<td>cheia de mudanças sem você prever o que vem a seguir</td>
</tr>
<tr>
<td>1.8</td>
<td>Quando no passado lhe acontecia alguma coisa desagradável, a sua tendência era para:</td>
<td>afundar-se no problema</td>
</tr>
<tr>
<td>1.9</td>
<td>Tem sentimentos e ideias muito confusos?</td>
<td>muito frequentemente</td>
</tr>
<tr>
<td>2.0</td>
<td>Quando faz alguma coisa que lhe dá satisfação</td>
<td>fica com a certeza que essa satisfação vai perdurar</td>
</tr>
<tr>
<td>2.1</td>
<td>Acontece-lhe ter sentimentos que gostaria de não ter</td>
<td>muito frequentemente</td>
</tr>
<tr>
<td>2.2</td>
<td>Tem a expectativa que a sua vida pessoal, no futuro:</td>
<td>não terá qualquer sentido ou projecto próprio</td>
</tr>
</tbody>
</table>

318
Pensa que haverá sempre pessoas com quem possa contar no futuro?
<table>
<thead>
<tr>
<th>respostas</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>duvido que haja</td>
<td></td>
<td></td>
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</tbody>
</table>

Acontece-lhe sentir que não sabexatamente o que está para acontecer?
<table>
<thead>
<tr>
<th>respostas</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>muito frequentemente</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Muitas pessoas (mesmo as que têm forte caráter) muitas vezes, em certas situações, sentem-se uns falhados. Com que frequência já se sentiu assim no passado?
<table>
<thead>
<tr>
<th>respostas</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>nunca aconteceu</td>
<td></td>
<td></td>
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</tbody>
</table>

Quando alguma coisa acontece, geralmente acaba por verificar que:
<table>
<thead>
<tr>
<th>respostas</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>avaliou mal a dimensão do problema</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Quando pensa nas dificuldades que vai ter de enfrentar em situações importantes da sua vida, tem o sentimento de que:
<table>
<thead>
<tr>
<th>respostas</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>conseguirá ultrapassar as dificuldades</td>
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</tbody>
</table>

Com que frequência sente que têm pouco sentido as coisas que faz na sua vida diária?
<table>
<thead>
<tr>
<th>respostas</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td>muito frequentemente</td>
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</table>

Com que frequência tem sentimentos que duvida poder controlar?
<table>
<thead>
<tr>
<th>respostas</th>
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<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td>muito frequentemente</td>
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</tbody>
</table>

Fim do questionário validado

Questões de investigação para cruzamento com o SOC:

Auto percepção da saúde

Comparando com as pessoas da sua idade, considera o seu estado de saúde
<table>
<thead>
<tr>
<th>respostas</th>
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<th>6</th>
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<tbody>
<tr>
<td>muito mau</td>
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Indicadores de saúde mental

Sente-se só
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<tr>
<th>respostas</th>
<th>1</th>
<th>2</th>
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</thead>
<tbody>
<tr>
<td>nunca aconteceu</td>
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</tbody>
</table>

Sente-se abandonado e esquecido
<table>
<thead>
<tr>
<th>respostas</th>
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<th>4</th>
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<tbody>
<tr>
<td>nunca aconteceu</td>
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Sente-se útil, aproveitado
<table>
<thead>
<tr>
<th>respostas</th>
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<th>4</th>
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<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>nunca aconteceu</td>
<td></td>
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</tr>
</tbody>
</table>
Indicadores do SCO em estudo - para validação de uma escala reduzida de avaliação rápida do SCO

<table>
<thead>
<tr>
<th></th>
<th>Sente-se confiante na sua vida, pois as coisas que lhe acontecem explicam-se bem e até eram de algum modo previsíveis</th>
<th>Sim</th>
<th>Não</th>
<th>Não sei</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Sente-se confiante na sua vida, pois tem ao seu alcance aquilo de que precisa para lidar com os acontecimentos da vida</th>
<th>Sim</th>
<th>Não</th>
<th>Não sei</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Sente-se confiante na sua vida, e por isso lida com as coisas da vida com empenho e interesse</th>
<th>Sim</th>
<th>Não</th>
<th>Não sei</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
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</tbody>
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Fim
APPENDIX 7

MATERNAL-FETAL ATTACHMENT SCALE
Escala de Ligação Materno-Fetal - MFAS – (M. S. Cranley, 1981)  
(Versão Portuguesa: I. M. Mendes, & M.C.Canavarro,1998)

Nome ______________________________________________________________              data__/__/__    ___semanas de gravidez

Centro de Saúde ___________ Processo nº __________ N° __

Por favor responda aos itens seguintes sobre si própria e o bebé que espera. Não existem respostas certas ou erradas. Procure responder de acordo com a sua primeira impressão, por ser aquela que melhor reflecte os seus sentimentos.

Assinale apenas uma resposta por cada item

<table>
<thead>
<tr>
<th>Costumo pensar ou fazer o seguinte:</th>
<th>Sim, sem dúvida</th>
<th>Sim</th>
<th>Não tenho a certeza</th>
<th>Não</th>
<th>Não, sem dúvida</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Falo com o bebé que ainda não nasceu.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Sinto que apesar de todos os incômodos da gravidez vale a pena estar grávida.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Gosto de ver a minha barriga mexer quando o bebé dá pontapés.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Imagino-me a alimentar o bebé.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Mal consigo esperar para ver como é o bebé.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Pergunto-me se o bebé se sentirá apertado dentro da minha barriga.</td>
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<td>7. Trato o meu bebé por um nome carinhoso.</td>
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<td>8. Imagino-me a tomar conta do bebé.</td>
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<td>9. Quase que consigo adivinhar a personalidade do meu bebé pela maneira como ele se mexe.</td>
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<td>10. Já decidi qual será o nome do bebé se for menina.</td>
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<td>11. Procuro manter hábitos saudáveis de vida que não manteria se não estivesse grávida.</td>
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<td>12. Pergunto-me se o bebé conseguirá ouvir dentro da minha barriga.</td>
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<td>13. Já decidi qual será o nome do bebé se for menino.</td>
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<td>14. Pergunto-me se o bebé já será capaz de pensar e sentir “coisas” dentro da minha barriga.</td>
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<td>15. Como carne e vegetais para que o meu bebé se alimente bem.</td>
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<td>16. Parece que o meu bebé se mexe com mais energia para me dizer que está na hora de comer.</td>
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<td>17. Empurro o meu bebé aguardando que ele me responda de forma diferente.</td>
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<td>18. Mal consigo esperar para pegar no bebé ao colo.</td>
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<td>19. Procuro imaginar como será o bebé.</td>
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<td>20. Faço festas na minha barriga para acalmar o bebé quando dá demasiados pontapés.</td>
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<td>21. Sou capaz de dizer quando o bebé está com soluços.</td>
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<td>22. Sinto que o meu corpo está feio.</td>
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<td>23. Desde que estou grávida deixei de fazer algumas “coisas” porque quero ajudar o meu bebé.</td>
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APPENDIX 8

EMOTIONAL AVAILABILITY SCALES

INFANCY/EARLY CHILDOOD VERSION

(CHILD AGE: 0-5 YEARS)
EMOTIONAL AVAILABILITY (EA)® CLINICAL SCREENER for the 4th edition of the EA Manual; should use this screener before actually scoring the individual EA Scales so that you have made a decision about the “zone” of attachment for a particular relationship

Adult sensitivity:

Adult structuring:

Adult nonintrusiveness:

Adult nonhostility:

Child responsiveness to the adult:

Child involvement of the adult:
Adult-child relationship observed to be exceedingly emotionally available. Stressors are being dealt with in an optimal way, as is feasible, given the situation and complexity of existing stressors. Both members of the dyad (adult and child) are emotionally recruitable—adult is sensitive to the cues and communications of the child, appropriately structuring of play and activities, appropriately non-intrusive, and non-hostile during interactions, and the child is socially and emotionally responsive and involving in appropriate ways (not people pleasing, negatively involving, or inappropriately responsive in a role-reversed or parentified ways).

Adult-child relationship is observed to be “good enough” in the sense of emotionally available caregiving and response to caregiving. Minor or major stressors may make this relationship cave in, but generally they seem positive. The adult is emotionally positive and there is an emotionally recruitable quality to this relationship, just as the above, but there is a less spectacular quality. The adult is generally sensitive, appropriately structuring, appropriately non-intrusive and non-hostile, and the child is socially and emotionally responsive and involving.

There is a separation between the adult and child, such that the adult seems to be using emotional availability skills quite well, but the child is lagging in terms of the child’s side of emotional availability, and seeming to have complicated emotional availability. That is, the adult is using “therapeutic” skills, but the child (either because of a disability or because of a prior attachment or emotional availability history) does not “match” the adult in emotional availability. The mis-match is related to the child’s dependency, however.

Adult-child relationship observed to be good in many ways, with a connection and good times, but the connection does not seem to be a fully healthy one—an “apparently” good connection is seen. “Apparently” means that in many ways the caregiver seems warm but that she or he encourages or nurtures dependency. The emotional availability seems exaggerated, with too many displays of inappropriate affect or pseudo-positivity. The mid-range in adult sensitivity, structuring, non-intrusiveness, and non-hostility is seen, and a mid-range in child responsiveness and child involvement. Although the dyad may be enjoying each other, the emotional interactions are not fully genuine and it is difficult to give a ‘clean bill of health’ to this relationship. Dependency or dependency-promoting qualities are seen in this version of emotional interactions. The adult’s affect is “off” in the sense of being pseudo or lacking genuine and sincere qualities. So, both adult and child are in the mid-range, suggesting that the dependency-promoting qualities of the adult are also seen in the child.

The adult-child relationship is mis-matched in terms of the emotional unavailability. The adult is detached, but the child still is seeking some connection or at least seems “open” to such connection.

Adult-child relationship observed to be detached, unavailable. Most qualities of emotional availability are low. Interactions between the adult and child are cool, distant, and avoidant. Both the adult and the child are distant, avoidant, detached, ignoring of one another.
Adult-child relationship observed to be in a traumatized zone. Here, the child is showing role-reversed, parentified qualities, taking care of or trying to take care of the other in the relationship, but such behaviors are not extremely clear cut. Over-responsive and/or over-involving qualities can be seen in the child, although they are not extreme. The adult is fostering these qualities in this child or is potentially trying to use therapeutic emotional availability skills to dissuade such behavior. Nonetheless, the child is showing some subtle signs of such behavior.

Adult-child relationship observed to be in a traumatized zone. Here, the child is showing role-reversed, parentified qualities, taking care of or trying to take care of the other in the relationship, but such behaviors are not extremely clear cut. Over-responsive and/or over-involving qualities can be seen in the child, although they are not extreme. The adult's behavioral style seems to further foster these qualities in this child.

Although the adult-child relationship has a traumatized quality, the adult seems to use emotional availability skills to try to pull up or treat this relationship. The adult is in the driver's seat in this respect but the child seems to have a clear history of trauma.

Adult-child relationship observed to have very extreme traumatizing qualities, traumatized in the past, disorganizing to one or the other member, and generally the affect is distressing or the behaviors or affect of one or the other member of the interaction is very very problematic. The relationship has a confused quality, either from the standpoint of both. Emotional interactions are not just 'garden variety' detached/shut down or dependent, but they are bizarre, dangerous, or present a threat for safety. Both adult and child show these qualities. This is a very extreme sort of disorganization.
Emotional Availability (EA) 4th edition: 6 global EA Dimensions and 7 Sub-Scales for each of the 6 Global EA Dimensions

Observer should view twice (once for the adult and once for the child).
Observation time: _____________________ Context: free play __semi-structured__separation/reunion__other stress ______Describe context/materials: ______________________
Instructions to the participants: ____________________________________________________________

Ideally, adult and child should be rated by different observers; using two observers to obtain inter-rater reliability and then having one observer code the adult's side of EA and the other code the child's side of EA is advised for psychometric reasons.

Narrative records on first viewing of episode(s) to be coded:
Adult sensitivity:

Adult structuring:

Adult nonintrusiveness:

Adult nonhostility:

Child responsiveness to the adult:

Child involvement of the adult:
Please print: Check in the box the number which best describes this quality in the actual session, rather than what you might know about the people from other sources. EA is based on observation. Next, please put a comment or two about what made you score as you did; comments are required of the coder, in case checking back is needed!

EA ADULT SENSITIVITY

1. Affect: Balanced, genuine, congruent, relaxed, low-keyed, gentle, soft spoken OR animated in appropriate ways, clear enjoyment of child; connection is a healthy/secure one (7)
Blunt, neutral affect most of the time (6)
Apparent/unnatural quality, sudden shifts, inconsistent; connection there but not necessarily a healthy one (4)
Little range, cool or detached; little or no connection (3)
Non-optimal, depressed, withdrawn, traumatized affect; aggressiveness/hostility (2, 1).

Note: Decide if there is a connection and if and, if so, if the connection is a healthy one. If the connection is healthy and secure, in your view, then you should be scoring this relationship higher than a 4. If there is no connection but the connection is, in your view, less healthy or of a dependent nature, then the mid-range is most appropriate. If there is no connection, detachment, then the relationship should be rated below close to a 5. A more traumatized type of relationship would receive the lowest rating.

7  4  1

2. Clarity of perceptions and appropriate responsiveness:
Awareness of signals and communications easily and correctly; seems willing to respond in an appropriate and prompt way (7)
Inconsistent in perception and/or responsiveness (4)
Unaware or oblivious to subtle cues and communications; aware of most blatant communications (1).

Note: Behavioral versus Emotional responsiveness: If adult scored relatively high in #2 (responsiveness), then think about whether he or she seemed behaviorally and emotionally responsive.
Only if both behaviorally and emotionally responsive/responsive can the adult score high in #1 (Affect)

7  4  1

3. Awareness of timing:
Aware of timing (3)
At times, seems off in timing (2)
Lacks awareness of the importance of timing (1).

3  1

4. Flexibility, variety, and creativity in modes of play or interaction:
Play is fun and lots of enjoyment and creativity during play. Adult is flexible (3)
Some playful times but seems repetitive, not fun or adult seems less flexible (2)
Very little play or variety, enjoyment, creativity, or sufficient flexibility seen (1).

3  1

5. Acceptance:
Speaks/acts in respectful ways (3)
Speaks/acts in occasional disrespectful ways, perhaps in a joking manner (2)
Speaks/acts in clearly disrespectful ways or does not speak or interact (1).

3  1
6. Amount of interaction:
   Enough interaction, given the context and/or directions (3)
   Minimal interaction, given the context and/or directions (2)
   Very little or no interaction (1).
   □  □  □

7. Conflict situations:
   Skillful in moving conflicts toward resolution or few conflicts to resolve (3)
   Not skillful in moving conflicts toward resolution or an intermediate range of conflicts (2)
   Does not try to move conflicts toward resolution or a great deal of conflict (1).
   □  □  □

   CHECKLIST: Did you score dyadically, taking into account the reactions of the child: Yes__No__
   Did you take into account both behavioral and emotional responsiveness: Yes__No__
   Did you score lower than a 4 if there was no emotional connection between the partners: Yes__No__
   Did you score higher than a 4 if there was a secure connection: Yes__No__
   Did you score in the mid-range if the connection was there, but it was not healthy or secure: Yes__No__

IF YOU ANSWERED 'NO' TO ANY OF THE ABOVE, GO BACK AND LOOK THROUGH YOUR SCORES ONCE AGAIN.

(1) GUIDELINES FOR TOTAL POSSIBLE POINTS: ADD THE ABOVE SUBSCORES: 29 (HIGHEST) - 7 (LOWEST): use as a
guide only
7= 29
6= 27-28
5= 20-26
4= 18-19
3= 11-17
2= 9-10
1= 7-8

(2) Also give a direct global score for sensitivity
**EA ADULT STRUCTURING**

1. Provides appropriate guidance and suggestions:
   - Uses preventive (proactive) guidance and suggestions, makes subtle, and varied suggestions or comments that lead the child along the right path for the situation; such guidance is not about just frequency but also about the appropriateness and emotionally scaffolding and enveloping quality of the inputs; the guiding comments and suggestions create a ‘holding environment’ for the child that leads the child in a positive way (7)
   - Inconsistent in providing preventive (proactive) guidance or vacillates between too much and too little guidance, and/or the guidance lacks a holding quality that can lead a child in a positive way (4)
   - Guidance and appropriate leading of any kind is almost nonexistent (1).

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2. Success of attempts:
   - Attempts are successful in that they move the child to a higher level and the child seems to attend and receive the inputs (7)
   - Attempts are not successful, although there may be plentiful—adult loses the child (4)
   - Attempts are repetitive and do not seem to influence the child or take the child’s reactions into account or there is no/minimal interaction (1).

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3. Amount of structure:
   - Just the right amount (3)
   - Less structuring than ideal (2)
   - Too little structure tried; the adult may interact, talk, or engage in parallel play but it is not structuring per se and there may be avoidance of structuring (1).

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4. Limit setting, setting boundaries proactively:
   - Sets limits and boundaries, appropriate to the task or situation (through verbal or subtle use of the gestural system) or no limits to set in the context (3)
   - On occasion, tries to set limits and boundaries but the strategies may not be ideal (or may be using only verbal means) (2)
   - Sets no limits (1).

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5. Remaining firm in the face of pressure:
   - Remains firm but continues to maintain the connection or child does not put pressure on the adult (3)
   - Inconsistent and caves in sometimes (2)
   - Caves in easily or there (1).

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6. Verbal vs. nonverbal structuring
   - Both channels are used to structure (3)
   - Only the verbal or nonverbal is used (2)
   - Neither is used much (1)

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7. Peer vs. adult role:
   - Adult is clearly the adult ("older and wiser") and uses the gestural system to indicate the difference in an appropriate way (3)
   - Adult and child sometimes seem like age mates, but other times they do seem at different levels (2)
   - Adult seems usually at the same level as child, or there is too little interaction to judge (1).

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CHECKLIST: Did you score dynamically, taking the reaction of the partner into account: Yes  No
Did you look at the success of the efforts, not just the efforts: Yes  No

IF YOU ANSWERED 'NO' TO ANY OF THE ABOVE, GO BACK AND LOOK THROUGH YOUR SCORES ONCE AGAIN.

(1) TOTAL POSSIBLE POINTS: ADD THE ABOVE SUBSCORES: 29 (HIGHEST) - 7 (LOWEST)
7= 29
6= 27-28
5= 20-26
4= 18-19
3= 11-17
2= 9-10
1= 7-8

(2) Also give a direct global score for structuring.
EA ADULT NONINTRUSIVENESS

1. Following child’s lead:
   - Lets the child lead and follows; a spacious quality to the interaction is the result (7)
   - If too little interaction to judge whether or not the adult has the tendency to follow the child’s lead, then the adult is less available for this quality and should be scored lower (5,6 depending on extent)
   - Less child generally follow in play but either assumes a lead role without regard for child during play or becomes overprotective or overly suggestive in other contexts, even if benign (4)
   - Leads, overmentors, overparent, and expects child to follow (1)

Note: For some interactions, the adult does not follow the child’s lead in any clear way, mainly because there is no little interaction upon which to base whether (or not) the child is being followed. The fact of not having much interaction suggests that the child’s lead is never being fully followed, as there should be instances of asking what the child is looking at, what the child is thinking, etc. if in fact the child’s verbal and/or nonverbal signs and communications were being followed. In short, minimal or no interaction suggests a lack of presence or availability for following of the child’s lead. The lack of interaction is taken into account in the first two subscales ONLY.

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2. Non-interruptive parts of entry into interaction:
   - Waits for optimal breaks to enter interaction, rather than interrupting the flow and interruptions are never physical (7)
   - If too little interaction present to judge this quality, then the adult is less available and should be scored lower (5,6 dependent on extent)
   - Sometimes just enters interaction or clearly interrupts, although it is not that often, or there are a lot of ‘don’ts’ (4)
   - Behaviorally enters interaction abruptly and interrupts very frequently, with lots of ‘don’ts’ or other physically intrudes (1)

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3. Commands, directives:
   - “Do’s” used sparingly or there is no context to see this (3)
   - Occasionally frames interactions with “do’s” (2)
   - Creates a situation of constant commands (1)

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4. Adult talking:
   - Talking is used as communication and part of dialogue (3)
   - Sometimes used to overpower or lecture or over teach (2)
   - Talking is just used for the adult’s take rather than as a form of communication or there is minimal talking (1)

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5. Didactic teaching:
   - Teaches a great deal but in a way that does not ignore relating (3)
   - Teaching, that does not take into account the presence of an interactive partner; occasionally, does not take into account an audience (2)
   - Teaches as if the child is an object and has a lot to catch up or there is little if any, teaching of any kind (1)

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6. Physical vs. verbal interferences:
   - Few verbal interferences and what exists may have been necessary (e.g., in an emergency) (3)
   - Interferences are usually verbal, when they occur, or there are few and far between (2)
   - Interferences are physical or there was one clearly physical one (1)

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7. The adult is made to "feel" or "seem" intrusive:
Child never indicates that the adult is intrusive (3).
Child sometimes indicates by his or her behavior that the adult is intrusive (2).
Child seems to rebuff or move away or otherwise indicate that the adult is being intrusive (1).

CHECKLIST: Did you code under nonintrusiveness, the interference of ongoing behavior, rather than structuring in positive ways:
Yes ______ No ______
If there was physical intrusiveness, did you score very low: Yes ______ No ______
Did you make sure not to score the very lowest if there were no physical signs of intrusiveness but there were other signs of intrusiveness: Yes ______ No ______

IF YOU ANSWERED 'NO' TO ANY OF THE ABOVE, GO BACK AND LOOK THROUGH YOUR SCORES ONCE AGAIN.

(1) TOTAL POSSIBLE POINTS: ADD THE ABOVE SUBSCORES: 29 (HIGHEST) - 7 (LOWEST)
7= 29
6= 27-28
5= 20-26
4= 18-19
3= 11-17
2= 5-10
1= 7-8

(2) Also give a direct global score for nonintrusiveness
## EA Adult Nonhostility

1. Adult lacks negativity in face or voice:
   - Does not use negative words or phrases, tone of voice is not negative (and there are no subtle signs of negative emotion or negative stress), good adult emotion regulation (7)
   - Some subtle signs are there, in bulk. That is, the signs of stress or negativity may be very slim and covert (huffing and puffing, easily irriated, impatience, long suffering attitude, slight anger), but there are a lot of them (4).
   - Negativity is there in voice or face (1).

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2. Lack of mocking, ridiculing, or other disrespectful statements and/or behavior and general demeanor, whether obvious or subtle:
   - No evidence of mocking, ridiculing statements and/or behavior (7)
   - Begins to say or do something like this, but stops self or seems aware (4).
   - Says such things in joking way “look at that funny face” as child eats spaghetti or some other statement and/or behavior that is disrespectful, mocking, or ridiculing (1).

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3. Lack of threats of separation:
   - Never uses threats of separation (3)
   - Begins to use a threat, but stops self (2)
   - Uses threats of separation (1)

   | 3 | 1 |

4. Does not lose cool during low and high challenge/stress times:
   - Able to maintain composure during stressful times, such as a timing time or after a separation, or when child is providing challenge or no challenging contexts (3)
   - Loses cool during such times but otherwise is able to remain stably calm or positive. This also needs to be chosen if the investigator is not using a stress context—cannot give higher than this if the context is low stress (2)
   - Loses cool under low challenge times and easily (1).

   | 3 | 1 |

5. Frightening behavior/behavior:
   - Does not show evidence of physical or verbal abusive behaviors (3)
   - Face or voice is frightening in some very subtle way (2)
   - Becomes verbally or physically abusive, pushing or pulling child or verbally attacking child, or some other clearly and overtly frightening behavior (1).

   | 3 | 1 |

6. Silence
   - Not silent very much (3)
   - Silent treatment when in a discipline situation or a clearly tension-filled situation (2)
   - Talks so little that the tone of the interaction seems deadened (1).

   | 3 | 1 |

7. Themes or play themes hostile
   - Play is appropriate to the materials and not necessarily malevolent, in that affect is clearly appropriate to the theme; play themes generally positive OR with positive resolution (note that lively play with malevolent themes can lead to positive outcomes, based on either child or adult facilitation of a positive outcome OR no pretend play is observed (3)
   - Play is violent or with malevolent themes that are clearly encapsulated within the play (2)
   - Play is violent with malevolent themes that are not necessarily called for by the play materials (1).

   | 3 | 1 |

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zbiringen@yahoo.com
CHECKLIST: Did you score any hostility in the environment, rather than just hostility directed toward the child: Yes____No____

Did you score a big dose of covert hostility as a '4' and very small amounts as higher: Yes____No____

IF YOU ANSWERED 'NO' TO ANY OF THE ABOVE, GO BACK AND LOOK THROUGH YOUR SCORES ONCE AGAIN.

(1) TOTAL POSSIBLE POINTS: ADD THE ABOVE SUBSCORES: 29 (HIGHEST) - 7 (LOWEST)
7= 29
6= 27-28
5= 20-26
4= 18-19
3= 11-17
2= 9-10
1= 7-8

(2) Also give a direct global score for nonhostility
EA CHILD RESPONSIVENESS

1. Affect/emotion regulation/organization of affect and behavior:
   Affect positive, even upbeat, and genuine, rather than in a people pleasing way; affect is used to decide if the child is emotionally connected to adult; child is even keeled and able to regulate emotions well; there is an organized, predictable quality, as well as potential emotional range that is appropriate to the context; child uses self or the adult to regulate emotions during challenging times and behavior and affect remain organized and resourceful; most commonly, a secure and confident child who can use his or her resources to effectively self-regulate, express feelings in face or tone will be placed here (7).

   Child's affect is generally positive, but there may be a quality of inappropriateness to it, e.g. less mature or people pleasing quality; there may be an emotional connection but not entirely healthy; child may get emotionally dysregulated occasionally or in challenging situations, show inconsistency and under-regulation; she or he may need to over rely on the adult in such situations; such over-reliance may or may not lead to optimal emotion regulation; child often distressed; most commonly, a distressed, under-regulated child, but connected with the adult would be placed here (4).

   Child's affect is emotionally shut down; child is not connected to adult emotionally; child is over-regulated and the self is organized through this shut down over-regulated way; most commonly, a shut down emotional tone is seen for these children (3).

   Child's affect is sad, irritable, depressed, threatening, aggressive, traumatized, confused, seeming threatened, and/or other negative forms of affect; child may become dysregulated and disorganized easily in a challenging situation or the child may show an overall quality of not being able to rely on others or the self to maintain equilibrium. Any one of the above (problems of affect, emotional dysregulation, and/or disorganization can be placed here (1).

   7  4  1

2. Responsiveness:
   When adult initiates, child is likely to respond verbally and/or nonverbally (7)
   When adult initiates, child is likely not to respond and seems oblivious or the adult does not initiate much (1).

   7  4  1

3. Age-appropriate autonomy-seeking and exploration
   Child shows some but not very clear signs of autonomy seeking, for his or her own age (2)
   Child seems passive and stays very close to the adult (either physically or emotionally) or shows too much autonomy seeking; either end receives this score (1).

   3  1

4. Positive physical positioning
   Child molds to adult's body and seeks out physical contact that is appropriate for age (3)
   Child seeks physical contact that may not be healthy, physical proximity seeking or proximity positioning indicates that the child may be overconnected (2)
   Child rarely, if at all, seeks physical contact or may be avoidant (1).

   3  1

5. Lack of role reversal/over-responsiveness
   Shows no signs of role reversal (taking care of the adult, parentified behaviors) (3)
   Shows minimal but some signs of role reversal (perhaps a few words that suggest this, said by child or adult, taking care of the adult in an age inappropriate way (2)
   Shows clear and distinct signs of role reversal (1).

   3  1
6. Lack of avoidance
Child is attentive to the play or activities, but not to the exclusion of the adult (3)
Child does not seem avoidance but also not connected either (2)
Child seems avoidance of adult (1).
3  1

7. Task oriented/concentrate
Focused on the object play and may not have much eye contact with adult, but this is because of the nature of the context; does not exclude (3)
Focused on the object play; may occasionally seem as if she or he is excluding the adult (2)
Focused on the object play and does exclude (1)
3  1

CHECKLIST: Did you make sure to score Affect/emotion regulation/organization/diorganization very heavily in the first subscale: 
Yes  No
Did you make sure to take into account affect and emotions more heavily than even obedience, compliance of the child: Yes  No

IF YOU ANSWERED ‘NO’ TO ANY OF THE ABOVE, GO BACK AND LOOK THROUGH YOUR SCORES ONCE AGAIN.

(1) TOTAL POSSIBLE POINTS: ADD THE ABOVE SUBSCORES: 29 (HIGHEST) - 7 (LOWEST)
7= 29
6= 27-28
5= 20-26
4= 18-19
3= 11-17
2= 9-10
1= 7-8

(2) Also give a direct global score for child responsiveness.
1. Simple Initiative:
Child shows initiative in bringing adult into interaction, by looking, talking, etc. (7)
Child initiates some of the time, but some of it seems positive and a good amount negatively involving, or the child's involving behaviors may be
combined with anxiety (4).
Child is quite uninvolved and may seem task-oriented (3)
Child does not initiate at all (1).

2. Elaborative Initiative:
Child involves in a way that creates a positive story line or brings the adult into a positively elaborated interaction, rather than simple exchanges
(7)
Child is moderately elaborative in initiative (4)
Child not seen elaborating and engaging after making initiatives (1).

3. Use of adult:
Seems to go to adult for emotional (e.g., hugs self) or playful exchange (3)
Seems to use the adult both emotionally and instrumentally (e.g., for eating, for getting things) (2)
Seems more like a tool the child uses to get instrumental (rather than emotional) needs met (1).

4. Lack of over-involvement
No evidence of negatively involving adult or other overinvolving behaviors (3)
Only rarely involving through distress, anxiety, or other negatively involving behaviors (2)
Clearly over-involving (1).

5. Eye contact, looking:
Child shows involvement through multiple nonverbal channels, e.g., eye contact, etc. and very frequently (3)
Child shows a few instances of involving behaviors through nonverbal channels (2)
Child shows no instances of involving behaviors through nonverbal channels (1).

6. Body positioning
Child involves through positioning body toward adult (3)
Child involves rarely through positioning of body toward adult (2)
Child never positions body facing adult or in some physical contact way (1).

6. Verbal involvement:
Child involvement, through babbling or talking, and frequently (3)
Only a few and scarce instances of involvement through babbling or other verbal means (2)
No instances of involvement, either through babbling or other verbal means (1).
CHECKLIST: Did you separate responsiveness from involvement, by including affect/emotion regulation/disorganization or organization of affective and behavioral interaction under responsiveness? Yes ___ No ___

Did you make sure to take into account looking and other nonverbal communication as ‘involvement’ especially in younger infants: Yes ___ No ___

IF YOU ANSWERED ‘NO’ TO ANY OF THE ABOVE, GO BACK AND LOOK THROUGH YOUR SCORES ONCE AGAIN.

(1) TOTAL POSSIBLE POINTS: ADD THE ABOVE SUBSCORES: 29 (HIGHEST) - 7 (LOWEST)
5= 29
4= 27-28
3= 20-26
2= 18-19
1= 11-17
1= 9-10
1= 7-8

(2) Also give a direct global score for sensitivity

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