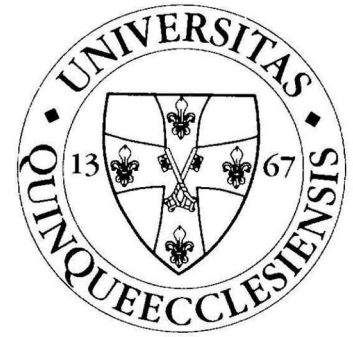Faculty of Health Sciences, University of Pécs

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The Relationship Between Health- Related Quality of Life, Mother's Birth Circumstances and Fear of Childbirth: A Transgenerational Approach

Ph.D. Dissertation

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Abbreviations

FOC	**Fear of childbirth**
WDEQ	Wijma Delivery Expectancy/Experience Questionnaire
SMD	Standardized mean difference
WHO	World health organization
QoL	Quality of life
HRQOL	Health related-quality of life
OT	Oxytocin
HPA	Hypothalamic–pituitary–adrenal
MFA	Maternal-fetal attachment
NST	Non-stress test
BAI	Beck Anxiety Inventory
BDI-SF	Beck Depression Inventory-Short Form
MSPSS	Multidimensional Scale of Perceived Social Support
MSPSS-SO	Multidimensional Scale of Perceived Social Support-Significant others
MSPSS-FAM	Multidimensional Scale of Perceived Social Support-Family
MSPSS-FR	Multidimensional Scale of Perceived Social Support- Friend
PROMIS	Patient-Reported Outcomes Measurement Information System
MFAS	Maternal-fetal attachment scale
MBCS	Mother's birth circumstances scale
EFA	Exploratory factor analysis
CFI	Comparative fit index
RMSEA	Root means square error of approximation
KMO	Kaiser–Meyer–Olkin
TLI	Tucker-Lewis index
EDA	Epidural anesthesia
CRH	Corticotropin-releasing hormone

Chapter 1: Introduction

1. Sub-study 1: Fear of childbirth and Health-related quality of life

It has been evidenced that pregnancy and transition to parenthood can raise feelings of love, joy, happiness, self-enrichment, personal development, family cohesiveness, and strengthened relationships. On the other hand, it may be paired with fear, uncertainty, a feeling of being at risk and anxiety about what the pregnancy and future may hold. These unpleasant feelings could affect the various aspects of a mother's personal life through developing some physical and psychological problems (1).

Fear of childbirth (FOC) is one of the common psychological phenomena in pregnancy that on intense levels can threaten both mother and baby's pre –and postnatal well-being.

1.1. Fear of childbirth during pregnancy

1.1.1. Psychological framework of fear in the context of childbirth

Although a precise psychological framework specifically related to fear of childbirth (FOC) has not been developed, we can elaborate on this phenomenon using some existing models presented for fear in general situations.

Rachman (1977)(2) and Barllow (2004)(3) have outlined three main trajectories for fear: first, conditioning fear and self-experiences, second, vicarious exposure (or observational learning) and the last, obtaining indirect information. Conditioning fear develops when a specific situation (e.g. childbirth) is alongside an unpleasant experience (e.g. maternal and/or neonatal trauma). This circumstance may lead to a learned fear due to the dangerous event itself. In accordance with this, some studies have reported the higher levels of fear among multiparous women with negative birth experiences such as emergency cesarean section (4,5). In addition, a generalization of experienced fear

or anxiety to another situation likely results in giving rise to the conditioning fears that mostly could see among nulliparous women. Some documents show that women with a history of some forms of childhood abuse (6) or intimate partner violence during pregnancy (7) express more fearful feelings of birthing (8).

The vicarious exposure that is defined as watching others while experiencing some situations (e.g. giving birth) could be effective in both positive (9) and negative (10) ways. This pathway of fear still needs to be more explored.

The last way is the transition of information via hearing aversive stories of birth, receiving lots of alarming information from social media, or education of dangers in schools. This wide focus on being at risk during pregnancy might provoke fear sensation, particularly in vulnerable women (11).

From the cognitive aspect, self-efficacy, perceived stress coping ability (intolerance of uncertainty), pain catastrophizing and anxiety sensitivity, are factors involved in creating fear (11).

According to Sharpe and Johnson (2012)(11) p:195, "catastrophizing is a negative cognitive-affective response to pain, which is characterized by the tendency to magnify and predict the worst concerning a particular experience of pain". Catastrophizing has been known as a significant contributor to the prediction and experience of childbirth pain and fear of pain (13) that is one of the most common elements of FOC (14). In fact, catastrophizing plays a role of mediator for fear of childbirth. Women with a tendency to catastrophizing consider pain as a serious threat and strongly concentrate on it to exaggerating its intensity leading to uncertainty about their ability in coping with pain (13).

Regarding anxiety sensitivity, it would be worthy of point out to the Reiss' expectancy model (15). This model describes three fundamental types of fear: the fear of injury, the fear of anxiety (anxiety sensitivity), and the fear of negative evaluation (15). Among these three types, anxiety sensitivity has recently been a center of attention in the context of FOC (16). Reiss (1991)(15) described anxiety

sensitivity as a personality factor that enhances the person's condition ability for fear due to irrational beliefs. These beliefs can appear in dimensions of physical concerns, psychological concerns, and social concerns. Physical concerns that are related to the fear of somatic features of anxiety, like tachycardia have significantly associated with FOC (17). Studies have argued that women with high levels of physical concerns are likely prone to fearfully respond to the physical symptoms of anxiety (18). This experience can be memorized for a long time and negatively affect subsequent pregnancy (17).

According to the Bandura (1983)(2)P:465, "self-efficacy theory posits that it is mainly perceived inefficacy in coping with potentially aversive events that makes them fearsome. If people believe they can exercise control over the occurrence of events that can be injurious, they do not fear them." It has been mentioned that the previous experiences of overwhelming on stressful situations by own and also, vicarious experiences that be described by others play a substantial role in forming self-efficacy (20). Thus, it is clear that how self-efficacy can be effective in enhancing confidence in the childbirth process among nulliparous and multiparous women. Women with low self-efficacy are not sure about their competences and capabilities to behave effectively during labor and giving birth process. Consequently, they would very likely perceive the higher levels of anxiety and fear of childbirth (21–23).

1.1.2. Definition of fear of childbirth

Although numerous studies have been conducted among women with severe fear of birth, no universal definition has yet been presented.

Initially, addressing the issue of fear of childbirth dates back to the mid of 19th century when Marce (1858)(23)P:460, described it as follows: "If they are primiparous, the expectation of unknown pain preoccupies them beyond all measure, and throws them into a state of inexpressible anxiety. If they are already mothers, they are terrified of the memory of the past and the prospect of the future". After that,

Wijma et al. (1998)(25) presented a simple definition of FOC as a negative appraisal and expectation of birth during pregnancy and negative experiences that be expressed after birth.

Siasto and Halmesmaki (2003)(26) suggested that seeking professional help to mitigate anxiety and FOC during pregnancy might be the best way for defining and recognizing intense fear. In some studies, fear of childbirth has been termed as tokophobia that means "an unreasoning and pathological dread of childbirth"(27–29).

Some others have classified FOC into three types of primary, secondary, and secondary to the prenatal depression (28,30). Primary FOC appears before first pregnancy, in adolescence or early adulthood. It is a result of fearful anticipation and expectations that may motivate women to use contraceptive regularly. The second one involves multiparous women resulting from previous negative experiences such as emergency cesarean section, instrumental vaginal delivery or any other perceived stressful situations. In the third types, fear of childbirth manifests as a symptom of prenatal depression that is alongside with recurrent intrusive thoughts of inability to giving birth and possibility of death (28,30). In terms of clinical diagnosis, severe fear of childbirth was included in ICD-10 Code O99.80, Other specified diseases in pregnancy, since 1997. Currently, it is included under 2015 ICD-10-CM Diagnosis Code F40.9 Phobic anxiety disorder, unspecified (31).

1.1.3. Content of fear of childbirth

The most common concerns related to childbirth among women include fear of pain, obstetric injuries, worries about their own and their baby's well-being and life (32–34), not receiving sufficient care from obstetrics staff during labor, losing control on their body and reactions, not being capable to handle delivery and performing badly (35,36).

Fisher et al. (2006) (37) have considered social and personal dimensions for fear of childbirth content. The social aspect is consisted of "fear of the unknown", "horror stories", and "expectations on the

woman from the medicalization of childbirth". Personal dimension is referred to the "fear of pain", "losing control and disempowerment".

More precisely, Eriksson et al. (2006)(38), assessed the content of fear according to the intensity. They observed that fears of own capabilities and reactions were significantly higher in women with severe fear than those with mild to moderate fear.

1.1.4. Prevalence of fear of childbirth

The prevalence rate of FOC is very different among surveys due to the variation in timing and way of assessment, and cultural context (39).

A large study conducted among just over than 7800 pregnant women living in six European countries estimated a total prevalence of 11.4% for primiparous and 11.0% for multiparous women. This prevalence was varied from 4.5% in Belgium to 15.6% in Estonia for primiparous women and from 7.6% in Iceland to 15.2% in Sweden for multiparous women (40).

Furthermore, a recent systematic and meta-analysis study investigated a worldwide pooled prevalence of 14% for severe fear of childbirth showing a threefold increase from the 1980s to 2016 (40). Respect to the parity and trimester of pregnancy, this study obtained a pooled prevalence of 16% in primiparous and 12% in multiparous groups. Also, those studies that were carried out in the third trimester yielded a higher pooled prevalence of 14% in comparison with 12% in the second trimester (41).

By region, the highest and lowest prevalence allocated to the Asian countries (25%) and European countries except for Scandinavia (8%), respectively. The prevalence in Scandinavia was 12%. Moreover, it was obtained 23% in Australian studies and 11% in American ones (40).

1.1.5. Measuring fear of childbirth

Regarding measuring fear of childbirth, a variety of instruments have been employed so far. Childbirth Attitudes Questionnaire (CAQ)(42), Fear of Birth Scale (FOBS)(43), International Statistical

Classification of Diseases and Health Related problems 10th Revision (44), and the Wijma Delivery Expectancy/Experience Questionnaire (WDEQ) are some frequently used measurements.

Among all of the used instrument, the Wijma Delivery Expectancy/Experience Questionnaire (WDEQ-A) is a well-known and frequently used instrument for assessing fear during pregnancy through "the woman's cognitive appraisal regarding the delivery"(25). Though this had originally been introduced as unidimensional with a cut-off ≥85 for detecting a severe fear of birth (25), some studies have used different cut-off points (66 or 71 rather than 85) (45,46), and also some others revealed multidimensionality of this instrument (47–49). They have argued that using a total score and defining a cut-off for categorizing fear of childbirth would not provide a precise understanding of the concept, which can be different from one society to another (40,49). On the other hand, considering and investigating subscales may lead to helping researchers to determine its predisposing factors and recognize susceptible women more accurately. Therefore, assessing the sub-scales rather than establishing a total score has recently been suggested (49).

1.1.6. Contributing factors in fear of childbirth

- *Social background risk factors:* in terms of socio-demographic characteristics, young age (50,51), being single (36), low education (50–52), low socio-economic level or unemployment (50,51) were significantly linked with severe FOC. Nevertheless, in another study, women with advanced age (age 40 years or more) and high social-economic status were more susceptible to experience severe FOC (5).

- *Obstetrics risk factors:* regarding obstetric risk factors, conflicting results have been obtained from studies in relation to the effect of parity on FOC (53–56). In multiparous women, having a history of miscarriage (52,57), previous experience of cesarean section or vacuum evacuation (44,54), and also previous complicated pregnancy and birth (58) were proven to increase the level of fear.

- *Psychological risk factors:* anxiety (52,57,59), depression (57,60,61), low self-steam(57,62), lack of social support and dissatisfaction in relation with a partner (62), and a history of childhood abuse (63) have been introduced as predisposing factors for fear of childbirth in different cultures. Furthermore, recently Hosseini et al. (2017) found out physical intimate partner violence during pregnancy can increase the chance of fear of birth after adjusting for confounder variables (7).

1.1.7. Consequences of fear of childbirth

Studies have revealed a wide range of aversive influences of severe FOC on mother and baby's well-being. Some physical and psychological consequences include eating and sleep-disorders and fatigue (64–66), hypertension and pre-eclampsia (67), post-traumatic stress disorder (68), and postpartum depression (69).

More importantly, the association between FOC and certain deleterious peripartum complications such as preterm birth (70), prolonged labor (71), elective and emergency cesarean section (39,72), negative birth experience (51) has been documented in recent studies.

Furthermore, FOC has been shown to be a cause of postponement or avoidance of pregnancy among nulliparous women (30). Besides, a Swedish study (72) showed that women with severe fear of childbirth in comparison with those with low fear had a significantly higher consumption of psychotropic medication, received more psychological support from midwives and social workers, needed longer hospitalization after delivery, and more postpartum visits due to childbirth complications. Additionally, the cost of caring and managing women with severe fear was estimated to be 38% higher than the other group (74).

1.1.8. Treatment of fear of childbirth

Due to some aversive consequences of FOC prenatally and postnatally, researchers have focused their attention on reducing this problem by planning different interventions.

More recently, a systematic review and meta-analysis have been conducted by MoghaddamHosseini et al (73) to focus exclusively on all types of interventions to reduce childbirth fear. Eight studies investigated education and two studies investigated hypnosis-based intervention meet inclusion criteria to enter into the meta-analysis. They found a significant effect of educational interventions and hypnosis on reducing the fear of birth during pregnancy and postpartum period. The pooled SMD of fear for the educational intervention and hypnosis group in comparison with the control group was -0.46 (95% CI -0.73 to -0.19) and - 0.22 (95% CI -0.34 to - 0.10), respectively. This meta-analysis suggests that the educational interventions may be more effective in this regard compared to the hypnosis interventions in declining fear childbirth. In more details, regarding the effect of prenatal class education in comparison with psycho-education intervention, this meta-analysis showed more effectiveness of antenatal class education. Nevertheless, researchers have pointed out further clinical trials with large sample size are warranted to confirm the most effective interventions.

1.2. Health-related quality of life in pregnancy

World Health Organization (WHO) (1994) defines the quality of life (QoL) as "the individual's perception of their life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns" (76). Quality of life is a broad and subjective term including all aspects of well-being and happiness (77). Health as a noticeable element of quality of life is labeled as the "health-related quality of life" (HRQOL)" (77). This concept and its determinants have evolved since the 1980s to encompass those aspects of overall quality of life that can be clearly shown to affect health—either physical or mental. It is a multidimensional concept comprising physical, mental and emotional, and social functioning domains (78).

In terms of the significance of HRQOL, increasing quality and years of healthy life had been taken into account as the first overarching goal for the Healthy People 2010 decade (79). At the present, it is one of the important targets of Healthy People 2020 by including it as one of the initiative's 4 overarching goals, "promoting quality of life, healthy development, and health behaviors across all life stages" and also one of the HP2020 4 foundation health measures (80).

In relation to the pregnancy period, certain studies have indicated a decline in HRQOL, especially in physical function and mental domain resulting from sleep deprivation, decreased physical function and vitality, and the increased prevalence of depressive symptoms (81–83). In this regard, Olsson and Lena (2004) reported a lower score in different domains of HRQOL that mostly resulted from physical inability in pregnant women with back pain in comparison to those without it (84).

Also, parity, nausea, vomiting and fatigue (85), pregnancy wantedness (86), pregnant specific health problems like a risk for preterm delivery (87), previous adverse pregnancy outcomes like recurrent abortion (88), and pregnancy-related anxiety are significant underlying causes of decrement in HRQOL that have been known by today (89). Moreover, a significant link between some socio-demographic variables such as social support, income, age, marital status, and work status and HRQOL has been revealed (89).

Regarding measuring HRQOL in pregnancy, a wide range of instruments has been employed in studies while most of them are generic and are not specified to the unique features and conditions of pregnancy. A systematic review (2012) of HRQOL measurements in pregnancy on 64 studies has argued that some used specific measurements such as Mother-Generated Index (MGI) (90) did not take into account to those aspects of women's reproductive health influencing on HRQOL and their most attention has been paid to the only psychological domain. This study emphasizes designing a comprehensive and specific instrument to measure HRQOL with a high usability in the maternal care settings and local and national surveillance systems of maternal morbidity (91).

Recently, Alcantara et al. (2015) in a systematic review aiming to assess the use of validated outcome measures in the chiropractic care of pregnant women, has pointed out to the "Patient-Reported Outcomes Measurement Information System (PROMIS)" as a valid, reliable, comparable, flexible and inclusive instrument for applying in maternal care settings and research among all other used instruments (92).

The Patient-Reported Outcomes Measurement Information System (PROMIS) that was established by NIH Roadmap for Medical Research Initiative is a valid assessment of HRQOL. In fact, it is a health domain- focused measurement system assessing all domains of HRQOL including emotional distress (i.e., anxiety and depression), fatigue, pain interference and intensity, physical functioning, sleep disturbance and satisfaction with participation in social roles (93). These domains are comprehensively consistent with the transient nature of pregnancy (94). By the best our knowledge, merely two studies have used PROMIS for assessing HRQOL in pregnancy till now (86,95). The first study (2017) (86) with the aim of finding a relationship between pregnancy context and women's HRQOL, employed PROMIS Global Short Form and the second one (2013) (95) used PROMIS- profile 29 to investigate the response of 6 pregnant patients to chiropractic care.

 Totally, respect to the evidence, PROMIS is the most precise and holistic tool to measure health burden of pregnancy and examine the effectiveness of interventions, preventive and promotional programs in the maternal health settings.

1.3. A theoretical model of the relationship between fear of childbirth and health-related quality of life
As has been mentioned above, FOC is paired with some negative physical and psychological consequences (e.g. fatigue, sleep disturbance, anxiety, and depression) that may be influential in different domains of HRQOl. However, respect to their multidimensional structure, it has not been evidenced that how FOC subscales can affect different domains of HRQOl and which of its domains

are mostly influenced by FOC. It is, therefore, essential to provide a hypothesized model to specify all the causal linkages between these variables after adjusting for confounding variables.

2.Sub-study2: Maternal-fetal attachment, fear of childbirth, and mother's birth circumstances from the aspect of intergenerational transmission of reproductive behavior

In this section neurobiological aspects of fear of birth and mother-fetal attachment with respect to the role of oxytocin will be discussed. Afterward, the possibility of the mother's birth circumstances effectiveness on maternal attachment and fear through the intergenerational transmission of oxytocin will be described.

2.1. Oxytocin and fear of childbirth

Oxytocin (OT) as the posterior pituitary neuropeptide hormone had been firstly known for its role in parturition and lactation. Following that, during the past several decades, scientists explored a broad range of function for OT particular in human's behavior and reactions. Non-social behaviors such as learning, anxiety, feeding and pain perception, and social behaviors like social memory and attachment, sexual and maternal behavior, aggression, human bonding, and trust are the implied functions of OT across studies (96).

The impact of OT on fear of childbirth can be described through three pathways: fear learning and memory, anxiety and stress, and mother's attachment style.

2.1.1. Oxytocin and learning and memory

As aforementioned in sub-study1, one of the noticeable trajectories of fear is acquisition and conditioning fear via previous experiences and learning. It is assumed that fear learning has a high potential to modify after reactivation (97). In this regard, OT has attracted attention for its effects on attenuating memory processes (96). Recent studies conducted among animal (97–99) and human (100) samples have underscored the role of OT in impairing fear acquisition and extinction consolidation

after OT administration. However, this effect relies on the site of injection, the time of injection and the drug used (100). It has been argued that this effect is a result of a connection between hypothalamus (as the main region of releasing OT) and limbic sites such as the hippocampus and the amygdala which contribute to regulation of fear memory by means of inhibiting excitatory flow from the amygdala to brainstem sites (101).

In the link between these findings and FOC, one can assume that some circumstances that raise the level of releasing OT and also its receptors like breastfeeding may be positively influential on lessening fear memory in women with negative experiences of childbirth or other life stressor events like child abuse. Accordingly, Mezzacappa and Katlin (2002) have shown more positive feelings toward childbirth in lactating mothers due to declining cortisol and rising OT levels (102).

2.1.2. Oxytocin, anxiety, and stress

An anxiolytic role for OT in reducing fear and stress has revealed by animals (103,104) and human (102,105) literature. It has been noted that physical and psychological stress and fearful situations can stimulate the secretion of OT both peripherally and within the brain via inhibition of the stress-induced activation of the hypothalamic–pituitary–adrenal (HPA) axis and reduction in amygdala activity in response to the feared stimuli (96).

In related to the humans, lactating women have shown a reduced response to physical and psychosocial stress exposure following an increase in OT levels and a decrease in cortisol ones owing to the breastfeeding (102). Moreover, a decreased rate of prenatal and postnatal depression symptoms has been observed following a rise in Peripheral OT concentrations (106).

Given to an overlap between anxiety during pregnancy and FOC, and considering childbirth as a stressful event, it would be plausible that the level of OT in late pregnancy and giving birth is effective on the intensity of perceived FOC.

2.1.3. Oxytocin, mother's attachment style, and pain perception

A correlation between self-report of attachment style in non – parents, and parents and the levels of plasma OT has been observed. The higher levels of OT has been demonstrated in women with secure attachment with their own parents (107,108).

On the other hand, Wilson and Simpson (2016), in their study on 140 first-time expectant mothers and their partners concluded that women with secure attachment experience lower pain during labor and delivery in compare to the evidently and anxiously attached women, showing their more susceptibility to having a painful childbirth (109). Two other recent studies have endorsed a consistent connection between greater attachment anxiety and greater acute pain perceptions and experiences during labor and 1–5 weeks after birth (110,111).

Linking two these findings (higher levels of OT in secured attachment women and their lower pain perception) to each other, it would be concluded that OT can indirectly impress childbirth fear and experience through mother's attachment style.

2.2. Oxytocin and maternal-fetal attachment

Cranley (1981) described maternal-fetal attachment (MFA) as "the extent to which a woman engages in behavior that represents an affiliation and interaction with the unborn child"(107) p:282.

In regard to using the term "attachment" for maternal-fetal relationships, the initial researchers (e.g., Cranley 1981 (111); Müller 1992 (113) ; Condon 1993 (114)) had referred it as "attachment" because the substance of maternal-fetal relationships deals with the development of feelings of love and protection, and these relationships are a strong emotional tie. However, some recent studies have often conceptualized it as the caregiving system rather than the attachment system. But in the present study, since this has been constructed on the Cranley's conceptualization and definition, we continue to use the concept "attachment" throughout the text.

Numerous studies have evidenced the continuity and effectiveness of prenatal maternal attachment on postnatal attachment and even during childhood (115,116). In this regard, certain evidence has illustrated a link between OT concentrations in the first and third trimester of pregnancy and MFA (117). In addition, a connection between OT levels in two these time points plus early postpartum and maternal attachment and bonding behaviors was observed. These studies have highlighted the contribution of OT during pregnancy and early postpartum in the prediction of MFA and postpartum attachment (118).

Concerning the different predictors of MFA, a critical review (2008) of 22 studies with the issue of maternal-fetal attachment pointed to depression, anxiety, and substance abuse as risk factors for MFA (119). Furthermore, a meta-analysis of 72 studies examined predictors of MFA defined gestational age, social support, and prenatal testing as predictors with high effect size while, anxiety, self-esteem, depression, planned pregnancy, age, parity, ethnicity, marital status, income, and education were placed in the lower degree of importance (120).

2.3. The relationship between mother's birth circumstances, maternal-fetal attachment, and fear of childbirth.

The role of OT in forming maternal behavior pioneering to the studies of Pedersen and Prange (1979) and van Leengoed et al. (1987) (121,122). The former showed "full maternal behavior" in virgin female rats after the injection of OT and the latter reported inhibition of postpartum maternal behavior following injection of the OT-receptor antagonist.

The evidence of intergenerational transmission of the maternal behavior to the rearing environment that probably relies on epigenetic processes has been displayed by several studies in rats and humans (123). Champagne (2001) found that maternal licking/grooming provides a potential mechanism for the intergenerational transmission of individual differences in maternal behavior through affecting the

development of estrogen sensitivity in brain regions that regulate maternal behavior (123). Following this, Francis et al. (2002), also, approved this result (124).

Champagne (2008) has stated that "In rodents, the epigenetic influence of maternal care on offspring's levels of steroid receptors provides a mechanism through which maternal care can be passed from mother to daughter and grand-daughter with implications for the inheritance of multiple aspects of offspring phenotype. These epigenetic effects, in the form of DNA methylation, exert stable effects on gene expression and behavior that permit the experiences of early infancy to influence adult reproductive behavior (125) p:10.*" Fish et al. (2004) have identified that altering in the acetylation of histones H3-K9, and the methylation of the NGFI-A consensus sequence on the exon 1(7) promoter are two processes for expressing of maternal care regulation (126).

Besides, studies have illustrated the impact of early environments such as an interruption in mother-infant interaction on neuroendocrine function and adult maternal behavior (127,128). Consistent results from primate and rodent studies confirm strongly effectiveness of the maternal environment on offspring phenotype and it's mediating by means of changes in gene expression (125). Lovis et al. (2001), experimented the effect of being separated from the mother in 3 female rats over the days of 3 to 17 postnatal and compared their offspring's juvenile and adult maternal behavior with the non-separated group. They found that a reduction in adult maternal licking and crouching over pups in the separated group, however, the effect on juvenile maternal-like behaviors was low (127).

Although there are profound studies in animals to elaborate the role and mechanism of epigenetic in the relationship between early life experiences, such as maternal care behavior, and life-long cognitive and emotional health, a few studies have been carried out among humans (129,130).

Significance of this project

In Hungary, like some other European countries, the cesarean section rate was 37,8% in 2015 (131) that is more than two times higher than what was suggested by WHO (10-15%) (132). On the other hand, there is an extensive literature on the association between severe fear of childbirth and elective and emergency caesarian section (39,72). Based on this, according to our knowledge, there is not any study to elaborate fear of childbirth in Hungary using a validated instrument. Also, no any study hasn't been yet explored the relationship between different dimensions of FOC and HRQOL as a noticeable factor in mother and baby's well-being.

Moreover, as was stated in sub-study 2, it has been little known that how early circumstances of birth can influence on offspring's reproduction and mental health in humans particular respect to the epigenetic regulation over time. Since, we considered the mother's birth circumstances (such as mode of birth, time of birth (e.g. full term or preterm), having breastfeeding, early rooming in with their own mother after birth, induced or augmented delivery) as early life environment to assess its association with MFA and FOC as a cognitive and emotional behavior in their daughters. By this way, we can enhance the existing knowledge regarding the importance of quality of prenatal and postnatal maternal care in relation to the long-lasting effects on maternal behaviors in the next generations.

Chapter 2: Aims, questions, and the hypothesis of the study

The main and secondary aims of this thesis are presented in bellow:

Main aims:

- To assess psychometric characteristics of WDEQ-A among nulliparous and multiparous Hungarian women.

- To assess the relationship between fear of childbirth and health-related quality of life among nulliparous and multiparous Hungarian women after controlling confounders.

- To assess the relationship between mother's birth circumstances and maternal-fetal attachment among nulliparous and multiparous Hungarian women.

- To assess the relationship between mother's birth circumstances and fear of childbirth among nulliparous and multiparous Hungarian women.

Secondary aims:

- To explore the content of fear of childbirth and determine its psych-socio-demographic and obstetric predictor factors according to the parity and subscales among nulliparous and multiparous Hungarian women.

- To assess the prevalence of health-related quality of life and determine its psych-socio-demographic and obstetric predictor factors according to the parity and subscales among nulliparous and multiparous Hungarian women.

- To assess the prevalence of maternal-fetal attachment and determine its psych-socio-demographic and obstetric predictor factors according to the parity among nulliparous and multiparous Hungarian women.

Hypothesis:

- Mothers with the higher level of fear of childbirth have the lower level of health-related quality of life during pregnancy.

- Mothers with positive early experiences such as rooming-in, early breastfeeding in their own birth circumstances have the lower level of fear of childbirth.

- Mothers with certain medical interventions such as amniotomy, OT administration in their own birth circumstances have the lower level of fear of childbirth.

- Mothers who were breastfed for a longer period during their infancy have higher levels of fear of childbirth.

- Mothers with positive early experiences such as rooming-in and early breastfeeding in their own birth circumstances have the higher level of maternal-fetal attachment.

- Mothers with certain medical interventions such as amniotomy, OT administration in their own birth circumstances have the lower level of maternal-fetal attachment.

- Mothers who were breastfed for a longer period during their infancy have higher levels of maternal-fetal attachment.

Questions

- What is the prevalence of each subscale of fear of childbirth and their predictors in nulliparous and multiparous Hungarian women?

- What is the prevalence of each domain of health-related quality of life and their predictors in nulliparous and multiparous Hungarian women?

- What is the prevalence of maternal-fetal attachment and its predictors in nulliparous and multiparous Hungarian women?

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Chapter 3: Methodology

3.1. Ethics:

The protocol of this thesis was approved by The Regional and Institutional Committee of Science and Research Ethics of the University of Pécs, Hungary (No. 5923).

3.2. Recruitment and procedure

In this population-based cross-sectional study, a convenience sample of pregnant women who meet included criteria was recruited at the Non-stress test (NST) laboratory of Department of Obstetrics and Gynecology, University of Pécs. Recruitment took place in two parts. The first part was conducted from April to August 2016 by a research assistant who had previously received communication and recruitment education. The second one was performed between September 2016 and February 2017 by an educated midwife working at the clinic.

Healthy pregnant women with a singleton pregnancy who were at the third trimester and able to speak Hungarian, not having a history of alcohol and/or drug abuse and also not suffering from any major psychological disorder over the past year were eligible to participate in the study.

Of the 392 pregnant women invited to the study, 370 agreed to participate after gaining information about the aims of the study, and have read and signed an informed consent form. They were then given a booklet of questionnaires and asked to return it at the subsequent visit appointment.

3.3. Measurements

- *The socio-demographic and obstetric checklist* included 6 questions concerning age, education, occupational status, economic hardship, marital status, and residency of the participants and their partners. In the part of obstetric data, this comprised 6 items related to the number of pregnancies,

gestational age, history of miscarriage, pregnancy status, the mode and experience of previous birth, and duration of breastfeeding in case of included (for multiparous women).

- *Wijma Delivery Expectancy/Experience Questionnaire(WDEQ- A)* is originally a 33- item questionnaire. All items are assessed on a six-point Likert scale with a range score of 0 for "not at all" to 5 for "extremely", according to the degree of agreement, making a sum score of 0 to 165. Higher scores show the higher levels of fear related to childbirth. Wijma et al. (1998) defined a sum score of 85 as a cut-off score for severe fear and ≥100 for clinical fear of childbirth. A Cronbach alpha score of 0.89 for nulliparous and 0.99 for multiparous women showed a good reliability of the instrument for both groups of pregnant women (42). The original English version of WDEQ- A was obtained with the permission of Professor Klaas Wijma. The questionnaire was translated from English to Hungarian by two bilingual obstetricians and was reviewed and discussed in the context of Hungarian culture by researchers. After that, this was back-translated to Hungarian by an independent professor of linguistics.

- *Beck Anxiety Inventory (BAI)* is a 21 item- instrument that is aimed to investigate the severity of anxiety. Each item is assessed on a four-point scale ranging from 0 ("not at all") to 3 ("severely"), making up a total score of 0 to 63. The higher the scores are, the higher the level of anxiety is (134). We used the Hungarian validated version of this scale which has been widely used for research purposes on the Hungarian population (135). The Cronbach alpha in the present study was 0.89.

- *Beck Depression Inventory-Short Form (BDI-SF)* is a 9- item scale that is well known to assess moderate and severe depression. Each item is assessed on a four-point scale (from 0 to 3) resulting in a total of 0 to 27. The Hungarian version of BDI-SF correlated well with the full 21 item version (136). In this study, we gained a Cronbach alpha of 0.71.

- *Multidimensional Scale of Perceived Social Support(MSPSS)* is originally a 12- item scale with strong psychometric features measuring both the perceived availability and adequacy of emotional and

instrumental social support from three sources of support including family (MSPSS-FM), friends (MSPSS-FR) and significant others (MSPSS-SO). Each factor compromised four items and each item is assessed on a seven-point scale, from 1 (very strongly disagree) to 7 (very strongly agree) (137). Ziment et al (1990) confirmed the internal reliability with the Cronbach alpha ranging from .90 to .94 for three subgroups and .92 for total score among the pregnant population (137). In this study, we obtained the Cronbach alpha of .56, .86, .94, and .67 for family, friend, significant other and total score, respectively.

- *PROMIS–43 Profile v2.0* is a 43- item scale compromising of seven subscales namely Physical function, Anxiety, Depression, Fatigue, Sleep disturbance, Ability to Participate in social roles and activities, and Pain interference. Each subscale has 6 items on a Likert point from 1(always) to 5(never). Also, there is a single item namely pain intensity that measures the degree of pain with a range from 0 (no pain) to 10 (worst imaginable pain) (138). Scoring of PROMIS-43 was conducted using "Health Measures Scoring Service" powered by Assessment Center [SM] which is a free online Web-based administrative platform enabling researchers to upload their data collection for capturing and analyzing participant data securely (139). In order to this, firstly the raw scores for each subscale are calculated by summing the item scores after adjusting for missing item responses, where at least 4 out of the 6 items in that subscale were answered. The raw scores are converted to T-scores in which 50 is the mean of a relevant reference population and 10 is the standard deviation (SD) of that population. The higher scores equal more of the concept being measured (e.g., more Fatigue, more Physical Function). Thus a score of 60 is one standard deviation above the average referenced population. This could be a desirable or undesirable outcome, depending upon the concept being measured (138). Accordingly, three categories of intensity have been considered for it including(140):

Scores 0.5 – 1.0 SD worse than the mean = mild symptoms/impairment

Scores 1.0 – 2.0 SD worse than the mean = moderate symptoms/impairment

Scores 2.0 SD or higher worse than the mean = severe symptoms/impairment

In the current study, we used the Hungarian version of the PROMIS-43 profile. Internal consistency of each domain was approved by Cronbach alpha of .68, .87, .86, .90, 62, .93, .96 for physical function, anxiety, depression, fatigue, sleep disturbance, ability to participate in social roles and activities, pain interference, respectively.

- *Maternal-fetal attachment scale (MFAS)* is a 24-item questionnaire that frequently has been employed to measure the behaviors and attitudes of pregnant women toward their pregnancies and their developing fetuses (112). Although Cranly (1981) originally introduced it with five subscales (112), factor analysis of the Hungarian version confirmed the single factor solution and using the total score was suggested by researchers (141). Each item rated on 5 points Likert, from 1(definitely not) to 5 (definitely yes), yielding a total score between 24 and 120. Internal reliability in this study was confirmed by the Cronbach alpha of .75.

- *Mother's birth circumstances* scale (MBCS) is a researcher- made a questionnaire for assessing the history of own mother's birth in terms of prenatal and postnatal environment and conditions. It is formed of three parts. The first part has two questions about the date of birth (due date, preterm or postterm) and mode of birth. The second part includes seven questions related to the kind of interventions such as induced labor with oxytocin, amniotomy, epidural analgesia, assisted birth (vacuum or forceps), and episiotomy that occurred during labor and birth. The last part with five items assesses the early experiences of birth like early breastfeeding(during the first two hours after birth), early rooming- in with mother, immediately skin- to- skin contact with mother, and the presence of father during birth.

All questions were coded as 1= if it had happened, 2= if it had not happened, 0= I do not know. Internal consistency was approved by a Cronbach alpha of 0.83 for the second part and 0.73 for the third part.

3.4. Statistical Analysis

3.4.1. Descriptive statistics were performed for psycho-socio-demographic and obstetric data and also all used questionnaires. To compare psycho-socio-demographic and obstetric characteristics, WDEQ-A, PROMIS-43, and MFAS between nulliparous and multiparous groups, Mann-Whitney u, Kruskal-Wallis, chi-squared tests, and Fisher's Exact Tests were applied (non- normality distribution was assessed by Kolmogorov-Smirnov test). In addition, the Friedman test was used to evaluate comparison within WDEQ-A subscales for both groups, followed by Wilcoxon signed- rank test with Bonferroni's correction to assess paired comparison.

3.4.2. To assess psychometric characteristics of W-DEQ A, exploratory and confirmatory factor analysis (EFA, CFA) were used to investigate the construct validity of W-DEQ A (based on common factor model) for nulliparous, multiparous and total of participants, separately.

In the first step, principal components analysis was performed to extract the factors of WDEQ- A, and varimax rotation was used to improve the interpretability of the solution (SPSS 22.0, IBM 2009). To identify the number of factors to retain, three decision rules were utilized: Kaiser's criterion, retention of eigenvalues above 1, and Catell's scree plot. In the next step, we adopted a confirmative approach using the Amos 24 software program. Structural equation models in the CFA were evaluated by the overall goodness-of-fit of the models and by the value and significance of each parameter in the model. To assess the adequacy of the models of previous factor analytic studies the comparative fit index (CFI), the root means square error of approximation (RMSEA) and the $\chi 2/df$ ratio were used. The chi-square statistic, in fact, is too sensitive to sample size, so it was divided by a sample size parameter (df) to counteract this dependence.

Spearman correlation coefficient was used to assess the convergent and divergent validity and reliability was measured by Cronbach's coefficient alpha to examine the internal consistency of the Hungarian version of WDEQ-A.

3.4.3. To define predicting factors for FOC, HRQOL and MFA from psycho-socio-demographic and obstetric features, we conducted the univariate and bivariate analysis followed by a multivariate linear regression using the stepwise method. In the first step, we adjusted for baseline values of covariates including socio-demographic variables (model 1), in the second step, for psychological variables (model 2), and finally, in the third model, we adjusted for all predictors (psycho-socio-demographic and obstetrics factors). All models were applied separately to the nulliparous and multiparous groups and for all subscales, some obstetric factors including the mode and experience of the previous delivery were entered into the model only for the multiparous group.

3.4.4. To assess the link between FOC and HRQOL, a multiple linear regression was performed, allowing for some other potential variables (confounders) expected to affect the change in different domains of HRQOL. At first, a stepwise procedure without including confounders was used to obtain unadjusted values. In the next step, the model re-assessed to determine the significance of each of the remaining variables after including confounders.

3.4.5. To determine the relationship between mother's birth circumstances and FOC and MFA, bivariate tests such as Mann-Whitney u and Kruskal-Wallis were applied.

The statistical package SPSS version 22.0 was used for the analyses.

All estimates of the regression model were reported with 95% confidence intervals (95%CI). Also, Statistical significance was assumed with p-values less than 0.05 in all analyses.

Chapter 4: Results

Out of the 370 women who agreed to participate in the study, 9 did not return their questionnaires, therefore, data of 361 participants were analyzed. Before the analyses were conducted, the data were screened and examined for accuracy of data entry, missing values, and fit between its distribution and the assumptions of the analyses.

4.1. Descriptive statistics

4.1.1. Basic Demographic and Obstetric Characteristics

Mean age of participants was 32.41 years (±5.32) ranging from 17 to 46 years old. Over half of the women (51.8%) had a high educational level and the majority of them (80.6%) were a full- time employee. With regard to marital status, almost 61.9 percent were married and nearly 2.5 percent were single. Moreover, 37.3% resided in urban areas and a large number of them (78.5%) reported no economic hardship.

In terms of obstetric characteristics, mean of gestational age was 36.98 week (±1.25). Three-fifths of the women were multiparous and almost 80% of them were expecting their second or third childbirth. In addition, for a large percentage of women (88.5%) pregnancy was wanted and they did not report any history of miscarriage (69.4%). Furthermore, normal vaginal delivery accounted for roughly two-thirds of the previous mode of birth and the vast majority of multiparous women (76.3%) recalled a positive experience of their previous birth. When asking of all women about their preferred mode of birth for the current pregnancy, 86.5% chose normal vaginal delivery.

Also, only 7.5% of multiparous women reported no history of breastfeeding in previous childbirth. When comparing these characteristics by parity, a significant difference was merely observed in the mean of age (p=0.00), and the history of miscarriage (p=0.00), between nulliparous and multiparous groups. All details are shown in Table1.

4.1.2. Psychological Characteristics and social support

The means BDI-SF, BAI, and MSPSS score in the total of participants were 4.19 (±3.60), 10.25 (±9.30), and 6.31(±3.60), respectively. No significant difference was observed between nulliparous and multiparous group (Table1).

4.2. Factor analysis study of WDEQ- A

4.2.1 Exploratory Factor Analysis

The sampling adequacy for the analysis was confirmed by Kaiser–Meyer–Olkin (KMO = 0.90) and Bartlett's test of Sphericity ($\chi 2$= 8076.14; p= 0.00). EFA was performed through principal component analysis on 33 items and yielded five factors with eigenvalues higher than 1. Scree plot also confirmed retaining 5 factors. Nevertheless, we had to remove one item (26; allow my body to take total control) due to obtaining a factor loading less than 0.40, and factor 5 as it consisted of only two items (32; the child will be injured, 33; the child will die). Intercorrelation between these two items was high (r= 0.76) while they showed a very weak correlation with other items. Finally, a 4-factor solution with 30 items was identified to explain 60.25% of the total variation.

The factors were labeled as "Social isolation", "Lack of positive emotions", "Moment of birth" and "Fear", including 10, 11, 5 and 4 items, respectively. Factor loadings of all these items were above 0.52.

The same factors were extracted in the parity subgroups; therefore, a summary of the results of the total sample are presented in Table 2.

4.2.2. Confirmatory Factor Analysis

We conducted CFA of the experience subscales using maximum likelihood. Model goodness of fit was evaluated using fit indices available in AMOS-24 including the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root mean square error of approximation (RMSEA).

In the first step, unidimensionality of the original version of WDEQ- A was tested by CFA which resulted in poor indices (CFI = 0.40, RMSEA = 0.016). Therefore, we did not consider the instrument being monofactorial anymore. Afterward, our 4-factor model identified by EFA was compared to other 4-factor models introduced by Johnson and Slade (2002), Takegata et al. (2013) and Pallant et al. (2016) (49,142,143). CFA failed to support these models but confirmed ours, where reasonable fit was detected (RMSEA = 0.07, CFI = 0.90, and TLI = 0.88) (Table3).

4.2.3.Concurrent/convergent validity

Spearman correlation coefficient test revealed a significant and fair correlation between BAI and all factors of WDEQ- A. The lowest correlation was observed between factor "Fear" and BAI (r= 0.16; p= 0.02).

BDI-SF correlated significantly and weakly with factors "Lack of positive emotions" (r= 0.23; p< 0.00) and "Moment of birth" (r = 0.18; p < 0.00). Ultimately, overall WDEQ- A showed a significant and fair correlation with BAI (r = 0.24; p < 0.00) and a significant and poor correlation with BDI-SF (r = 0.15; p = 0.00). (Table 4)

4.2.4. Internal consistency

As Table 2 shows, the Cronbach's α coefficients of all factors were higher than 0.80, stating a good reliability. The alpha figures obtained for the overall WDEQ- A stood at 0.92, confirming reliability for the Hungarian version of this instrument.

4.3. Descriptive analysis of fear of childbirth subscales and predicting factors

4.3.1. Comparison between WDEQ- A subscales

Firstly, we assessed the mean scores of items forming WDEQ- A subscales by parity indicated in Table 5.

Afterward, in order to able to compare the mean score of subscales with each other, the obtained row mean scores were transformed to a range of 0-100. Accordingly, subscales Fear and Moment of birth obtained the highest and lowest mean scores, respectively in both groups of participants (Table 6). Results of the Friedman test indicated a significant difference among all subscales in both groups (Table 6).

4.3.2. Comparison WDEQ- A subscales between nulliparous and multiparous

A comparison between nulliparous and multiparous groups resulted in a significantly higher mean score of Isolation ($p<0.05$) and Lack of positive emotion ($p<0.05$) in nulliparous than that of in multiparous. Moment of birth and Fear mean scores were relatively similar in both groups (Table 6).

4.3.3. The highest level of WDEQ- A subscales

To identify participants with the high level of fear in each subscale, we considered mean+1SD as a cut-off point in each subscale in nulliparous, multiparous, and the total of participants separately. The results were almost the same, therefore, we reported the findings of the entire of participants. According to this, the largest and smallest percentage of high fear were allocated to the subscale Fear (19%) and Lack of positive emotions (13%), respectively (Table 7).

4.3.4. Predictors of fear of childbirth in nulliparous women

We used the multiple linear regression analyses to identify underlying predictors of FOC by subscale and parity after finding associated factors using bivariate analysis. We applied three models, as has been mentioned in 3.4.3.

According to the third model, anxiety was the single significant predictor of higher Isolation. Anxiety and wanted pregnancy significantly contributed greater Lack of positive emotion. Subscale Moment of birth was predicted by having economic hardship and anxiety. Being a housewife and anxiety predicted significantly the higher level of subscale Fear.

As it is clear, anxiety was a common significant predictor of the higher level of FOC in all four subscales (Table 8).

4.3.5. Predictors of fear of childbirth in multiparous women

In the multiparous group, we added two more predictors into the model, the experience and mode of previous birth. Findings indicated that for Isolation, being married, depression, and having negative experience were significant predictors.

Anxiety, having normal vaginal delivery, and elective cesarean section in the previous delivery could significantly predict lack of positive emotion. While for Moment of birth subscale only anxiety emerged to be a significant contributor. Fear subscale was predicted by anxiety and being a housewife (Table 8).

Relatively similar to the nulliparous, in the multiparous group anxiety was a significant predictor of all subscales except for Isolation. While in nulliparous being a housewife significantly increased the score of the subscale of Fear to around 15 points, it had a negative link with this subscale in the multiparous group, reducing as much as 17 points (Table 8).

4.4. Descriptive analysis of PROMIS-43 subscales and predicting factors

4.4.1. Comparison of PROMIS-43 domains between nulliparous and multiparous

Considering T-scores of 50 as the mean of the reference population, Physical function with a mean T-score of 39 showed the greatest difference with a mean of the normal population in both groups. Comparing mean T-scores of PROMIS subscales between nulliparous and multiparous groups revealed the higher mean scores for subscales "Anxiety" and "Ability to participate in social roles" in nulliparous than those in multiparous group. However, just the difference of Anxiety was significant. Mean T-score of other subscales was relatively similar in both groups (Table 9).

Assessing T-score ranges showed that the normal range accounted the largest proportion of the nulliparous participants in all subscales, apart from Fatigue and Physical function for which, mild (41%) and moderate (51.7%) range obtained the highest percentages, respectively (Figure1).

Relatively similar, in the multiparous group, the largest proportion of participants felled into the normal range in all subscales except for Physical function and Fatigue. For Physical function, 52% of women stood at the moderate range and for Fatigue, 37% of them showed the mild range (Figure2).

When comparing the T- score ranges of each domain by parity, the only significant difference was observed for the subscale Ability to participate in social roles (p=.045) (Table 10).

4.4.2. Predictors of Health-related quality of life in nulliparous women

After performing bivariate and univariate analysis, the multiple linear regression was employed to identify predictors of Health-related quality of life by subscale and parity. All psych-socio-demographic and obstetric characteristics, and also social support subscales that were significantly associated with HRQOL domains entered into the model. Table 11 and 12 depict all significant results in both groups.

In nulliparous, results of the final models revealed that depression was a significant predictor of poorer HRQOL in all subscales apart from Physical function and Pain intensity. Anxiety was known to be a significant determinant of higher Depression, Fatigue, Pain interference, and Pain intensity. Lower Depression and Pain intensity subscales were significantly predicted by MSPSS-SO.

Among socio-demographic and obstetric variables entered into the model, only the partner's age significantly emerged as a predictor of lower Ability to participate in social roles.

Subscale Physical function was not significantly predicted by any one of the predictors (Table 13).

4.4.3. Predictors of Health-related quality of life in multiparous women

In the multiparous group, depression emerged as the significant predictor of higher Fatigue, Anxiety, and Pain interference, and lower Physical function. Anxiety predicted significantly higher Sleep disturbance, Depression, and Pain intensity. In addition, lower Depression and Fatigue were significantly predicted by MSSPS-FAM and MSSPS-FR, respectively.

In terms of obstetrics characteristics, wanted pregnancy and gestational age were determined as the significant predictors of lower Pain intensity and Fatigue, respectively. In contrast, having emergency CS in the last birth could significantly predict higher Pain intensity.

Of the socio-demographic variables, in similar to the nulliparous, only partner's age could significantly predict poorer HRQOL in subscales Pain interference and Pain intensity (Table 14).

Overall, as has been illustrated in the Tables 13 and 14, identified predictors explained between 17-62% and 16-64% of the variance in the different HRQOL subscales in nulliparous and multiparous, respectively.

4.5. Descriptive analysis of MFAS and its predicting factors

The mean score of MFAS was 100.89 (±9.43) and 99.45 (±10.55) in nulliparous and multiparous, respectively. No significant difference was obtained between two groups (z=- 0.43; p=0.63).

To define predictors of MFA, firstly we assessed the association between psycho-socio-demographic and obstetric characteristics, MSPSS subscales, and also the history of breastfeeding (only in multiparous women). We then entered significant variables into the regression model separately by parity.

Obtained results from the multiple linear regression model revealed that in nulliparous MSPSS-FR, gestational age and unwanted pregnancy could significantly predict higher MFA.
In multiparous women, merely MSPSS-FR was a significant contributor for MFA. The previous mode of birth and birth experience, and history of breastfeeding in this group did not significantly correlate with the MFA (Table 15).

4.6. Descriptive analysis of Mother's birth circumstances

According to their mothers' recollections, almost 65% of the respondents were born on due date. The majority (86%) were born vaginally. In terms of medical interventions during labor and delivery, just over half of their mothers had episiotomy and a mere 7% were born by means of instrumental delivery (forceps/vacuum). The incidence of administration of EDA and OT during the respondents' birth was 20% and 12%, respectively.

Regarding early experiences, skin-to-skin contact immediately after birth, early breastfeeding in the hours right after birth, and rooming-in during the hospital stay were reported by a minimum of 15%, 24%, and 13% of women, respectively. In addition, three-fourths of women were breastfed during their infancy for a shorter or longer period. Table 16 shows all of the details.

4.7. The relationship between fear of childbirth and health-related quality of life

The multiple regression analysis was performed to examine if FOC predicts HRQOL by subscales and parity after controlling potential covariates. All significant variables that have been illustrated in Tables 10 and 11 were entered into the model as covariates for each HRQOL subscale.

Adjusted multiple regression model in the nulliparous group revealed that of the four subscales of FOC, "Isolation" and "Moment of birth" contributed in predicting some domains of HRQOL. Accordingly, Isolation significantly predicted poorer HRQOL in domains sleep disturbance (adjusted OR=0.28; 95%CI, 0.11, 0.48), pain interference (adjusted OR=0.22; 95%CI, 0.10, 0.41), and physical function (adjusted OR= -0.22; 95%CI, -0.28, -0.02). In opposite, Moment of birth (adjusted OR=0.27; 95%CI, 0.07, 0.43) emerged as a predicting factor for the higher levels of physical function (Table17).

In multiparous women, Isolation showed to be a significant contributor only for sleep disturbance (adjusted OR=0.35; 95%CI, 0.17, 0.41). In addition, subscale fear could predict the higher level of depression (adjusted OR=0.17; 95%CI, 0.03, 0.61) and anxiety (adjusted OR=0.24; 95%CI, 0.26, 0.75) in HRQOL (Table18).

4.8. The Relationship between mother's birth circumstance and fear of childbirth

Using bivariate analysis, we evaluated the link between mother's birth circumstances and FOC across the entire participants. In this part, respondents whose mother did not have recollections about the particular items of the early postpartum period were excluded from the analysis.

Results showed that the level of FOC in all subscales apart from fear in participants who had been born via emergency CS was slightly higher than those had been born through normal vaginal delivery, however; it was not significant.

Participants whose mothers experienced certain medical interventions such as amniotomy, OT administration, scored markedly higher on certain subscales of W-DEQ A in comparison with those without these interventions. Of these items, higher scores on subscales 'Moment of birth' (p = 0.03)

and 'Fear' (p = 0.01) were associated with the administration of OT during their own birth. Higher scores on subscale 'Lack of positive emotions' (p = 0.02) were associated with amniotomy during labor of the respondents' mothers (Table 19).

We could not find any association neither between the respondent's mothers' early postpartum experiences nor between the duration of having been breastfed and scores reached on w-DEQ A subscales (Table 19).

4.9. The relationship between mother's birth circumstance and maternal-fetal attachment.

In relation to MFA and medical interventions, investigations showed that MFA in participants whose mothers had experienced amniotomy, EDA, OT induction, instrumental delivery, and episiotomy was slightly higher but not significant than those without these interventions.

In terms of early experiences, MFA was lower in subjects whose mothers had experienced those options, showing no significant relationship.

Furthermore, although MFA in women who had been fed by breast milk for 6-12 months was the highest in comparison with others, no any significant relationship was obtained (Table 19).

Also, when assessing the relationship between MFA in participants and the duration of breastfeeding, the longer period of this corresponded with a moderately higher MFA, but it was not significant (Table 20).

4.10. The relationship between the history of breastfeeding and fear of childbirth and maternal-fetal attachment in the current pregnancy.

In addition, we examined the link between the history of breastfeeding in the previous birth and FOC and MFA in the current pregnancy in multiparous women. Using the bivariate testing, a negative relationship was found between the history of breastfeeding and FOC in subscales Isolation, Fear, and

Lack of positive emotion. Accordingly, a longer duration of breastfeeding was responsible for a reduction in the level of FOC that was significant in subscales Isolation (p=0.01) and Fear (p=0.01). The significant value for subscale Lack of positive emotion was rejected in p=0.059 (Table 21).

When we evaluated the association between history of breastfeeding and FOC through multiple linear regression model, unadjusted results showed that no lactation history in previous birth is significantly linked with higher level of Isolation (unadjusted OR=0.19; 95%CI, 1.82, 10.18; p=0.00) and longer than 12 months of breastfeeding could significantly predict lower level of subscale fear (unadjusted OR=- 0.15; 95%CI, -2..54, -0.15; p=0.02). However, after adjusting, only no history of lactation remained significant in the model for Isolation (adjusted OR=0.21; 95%CI, 2.13, 9.66; p=0.00).

Regarding MFA, no significant relationship was found.

Chapter 5: Discussion

5.1. Discussion of findings

5.1.1. The psychometric characteristics of the Hungarian version of WDEQ- A

In this project, we first assessed the psychometric characteristics of the Hungarian version of the Wijma delivery expectancy/experience questionnaire (WDEQ- A). Results of exploratory factor analysis (EFA) confirmed the existence of four subscales with 30 items and Confirmatory factor analysis (CFA) confirmed the multidimensionality of the instrument. This finding is in line with several other studies from different cultures that dismissed the notion of unidimensionality by yielding in a 4-factor solution for WDEQ- A (49,142,143). However, there are the ones conducted in Norway (48) and Italy (47) introduced six subscales with 25 items and three factors with 14 items, respectively. As a result, Pallant et al (2016) have pointed out that due to the confirmed multidimensionality of the instrument, calculation of an overall score might be inadvisable (49).

In our study, the first factor called "Isolation" share the same items (abandoned, desolate and lonely) as the corresponding factors of previous studies conducted in Australia (48), UK (142), and Japan (139). In the Australian study, this factor was labelled "Social isolation".

Factor "Lack of positive emotions" share the most in common with the study of Pallant et al. (49), as they consist of 11 common items (the corresponding factor of the Australian study has one more item, which is happy). Certain items (glad, proud and fantastic) in this factor are the same as in the corresponding factors of other recent studies (48, 138,139).

Factor "Moment of birth" shares three common items of five (natural, enjoyable and totally as it should be), with the corresponding factor of the Australian study (48). Factor "Fear" has similar items (afraid, tense and pain) with the corresponding factors of studies from Japan (139) and UK (138) and common items (afraid, tense and deserted) with a Swedish factor analytic study (144). Although factors in our

and other authors' studies share the same items in many cases, certain discrepancies were also found. This might be due to differences in the ruling obstetric-perinatal model from country to country. This finding highlights the significance of cultural context related interpretation of FOC.

During EFA we had to remove items 32 and 33, which refer to concerns and negative thoughts about the well-being of the child. Although one might think that concern about the baby's health and fear of his/her suffering from birth injury are among the most important sources of fear (34,145), this was not confirmed from the psychometric aspect. The factor consisted of merely 2 items; therefore it had to be considered a weak and unstable factor (146). As a result, similarly to some other studies (47,49), we decided to drop out these items.

In terms of concurrent/convergent validity, BAI scores displayed a statistically significant but fair correlation with all factors of WDEQ- A. Interestingly, the lowest correlation was observed between factor "Fear" and BAI scores. BDI-SF scores had a significant and poor correlation with factors "Lack of positive emotions" and "Moment of birth". However, both BAI and BDI-SF scores significantly but poorly correlated with WDEQ- A total score. These findings were in line with other studies' findings that may refer to the distinct entities of general anxiety, depression, and fear of childbirth in pregnant women (47,147). Fenaroli et al. (2013) reported a fair but significant correlation between certain factors of WDEQ- A and State-Trait Anxiety Inventory and Edinburgh Postnatal Depression Scale scores, respectively (47).

The Hungarian version of WDEQ- A proved to be suitable in both nulliparous and multiparous women for research and clinical purposes. However, further studies applying Rasch analysis and preferably higher sample size need to be performed to put to test this capability and to detect possible hidden difference according to parity in the concept of fear of childbirth.

5.1.2. The exploration of fear of childbirth subscales and determination of their predictor factors

The second part of this project was allocated to explore FOC based on the WDEQ- A subscales by parity and also, defining their predictor factors.

In both groups of nulliparous and multiparous, Fear and Moment of birth subscales showed the highest and lowest mean score, respectively. When examining items comprising Fear subscale, we observed that two items namely "pain" and "afraid" had the greatest mean scores of all. Given that WDEQ- A assesses the expectations and fantasies of the upcoming birth, it can be said that imagining the childbirth process to be dreadful and painful are the most important contributors for fear in Hungarian pregnant women. It is in line with some other studies from different cultures introducing the fear of pain as one of the most common reasons behind the fear of childbirth irrespective of the parity (26,34,148,149).

Moreover, nulliparous women in comparison to multiparous showed a significantly greater mean score in Isolation and Lack of positive emotion. Most recently, Pallant et al. (2016) compared the WDEQ-A mean scores of each subscale by parity, reporting a higher mean score of all 4 subscales in nulliparous than that in multiparous (49). The extracted subscales in their study were largely similar to ours.

Based on items forming Isolation subscale, it is elicited that nulliparous women have more fear of being left alone, losing self-control, behaving badly and of hopelessness during labor and childbirth. Maybe because of this, they do not expect to perceive positive and joyful feelings, leading to high scores in "Lack of positive emotion". In a study conducted among nulliparous Hungarian women in 1998, 16.6% of participants expressed fear of being left alone (32).

One study has suggested that childbirth experience has this possibility to either boost self-confidence and trust or quite the contrary. Besides, building a relationship based on trust with a midwife and also the presence of a supportive and efficient partner during labor and childbirth might eliminate feelings of loneliness and abandonment (150). In our clinic, most pregnant women are supported during labor by a person close to them who is often their partner. Furthermore, the number of married women in the

multiparous group was higher than in the nulliparous and this factor was a negative significant predisposing factor for Isolation in that group. Therefore, these circumstances can explain the lower score of Isolation and consequently lack of positive emotion in multiparous women in this study.

Considering mean+1 SD as a cut-point score, results showed that a range of 13-19% of participants in each subscale needed more psychologically investigations and attention. Pallant et al. (2016) determined the high level of fear through using median (2.5) as a cut-point in each subscale. On the contrary with us, subscales Lack of positive emotions (24.6%) and Fear (3.8%) had the largest and smallest percentage of cases with a high level of fear (49).

Although we applied an aforementioned method for defining women with the high level of fear using a statistical method, further studies are strongly recommended to define clinically women suffering from intense level of fear via precise psychological diagnostic tests.

In terms of factors predicting fear of childbirth, interestingly, anxiety proved to be a significant predictor of all subscales in both groups apart from Isolation in multiparous in which depression was a significant predictor. This finding is consistent with some previous studies that have revealed a moderate to the high relationship between anxiety and fear of childbirth (16,52,60).

Nevertheless, unlike in our study, the total score of fear of childbirth was considered in all of these studies. Also, only one study reported this correlation according to the parity in which, trait anxiety was a predictor of fear merely in the nulliparous group (16). In contrast, in our study anxiety had a slightly more powerful effect in multiparous than in nulliparous, likely resulting from previous negative experiences of pregnancy and delivery.

Regarding obstetric factors in nulliparous women, those with wanted pregnancy experienced more positive emotions scoring (as much as) nearly 8 points higher than women with an unwanted pregnancy. In the multiparous group, having had a negative experience of previous delivery increased the score of

Isolation subscale significantly. In addition, women with normal vaginal delivery and elective cesarean section in their previous birth expressed greater positive emotion.

In general, it seems that obstetric factors mostly affect the quality of emotions that women experienced during pregnancy. The role of previous negative birth experience in raising the levels of fear in the subsequent childbirth has been highlighted in numerous studies that can be due to obstetric complications, especially having an emergency cesarean section or instrumental vaginal delivery (39,54,58,152). In addition, some objective factors such as lack of efficient care and effective support from a midwife (39,152), disability in self-control (39), and unmet expectations of childbirth process (153) have been mentioned to produce negative birth experience, causing feelings of hopelessness and loneliness in the next pregnancy.

Accordingly, the results of this study fall in line with previous ones, explaining why multiparous women with negative birth experience express a raised level of fear of Isolation during a subsequent pregnancy.

This study showed a significant positive impact of previous normal vaginal delivery and elective cesarean section on ameliorating negative emotions towards a subsequent childbirth. Elective cesarean section reduced the score of "lack of positive emotion" more than normal vaginal delivery. Toohill et al. (2014) demonstrated a protective effect of normal vaginal delivery and on the contrary, a diverse effect of elective cesarean section on having fearful feelings in the subsequent pregnancy (56). In this regard, Hildingsson et al. (2011) and Karlström et al. (2011) concluded that offering elective cesarean section to pregnant women with the high level of FOC cannot be an effective solution for reducing fear in the subsequent pregnancy (154,155). In our study, elective cesarean section showed to be effective in reducing only one subscale score of FOC.

Further studies, thus, are needed using the same method in assessing fear of birth to explore this correlation more precisely.

5.1.3. Investigating HRQOL domains and determining their predictors according to the parity

This study is the first of its kind to examine HRQOL by means of PROMIS-43 according to the subscales and parity.

Our results estimated the poorest HRQOL in the Physical function and Fatigue domains in comparing to the other domains in all participants. Nevertheless, surprisingly most participants fell into the normal range. Two exceptions were allocated to the Fatigue and Physical function, for which mild and moderate range had the highest percentages, respectively.

In comparison by parity, nulliparous had significantly experienced poorer HRQOL in domain Anxiety than multiparous women. Measuring anxiety by BAI, also, showed this difference but not significantly. In line with our results, others have introduced physical function as the most affected domain of HRQOL during pregnancy (83,89,156). In a cross-sectional study conducted among Canadian pregnant women at their third trimester, the poorer HRQOL was found in five of the eight domains of SF-36 including physical function, role limitation due to physical health, bodily pain, vitality, and social function. While Physical function domain showed significantly the worst HRQOL, mental health domain did not obtain significantly lower score compared to normative means (89).

Though our participants included of healthy pregnant women without any history of chronic physical and/or psychological disease, they highly likely suffered from some somatic problems like back pain due to physiological changes during pregnancy, particularly in the third trimester, that can negatively affect their physical function. As Olsson and Nilsson-Wikmar (2004) revealed the impaired HRQOL mostly in the physical function domain in pregnant women with back problems in comparison to those without it (84).

Our finding of higher anxiety in nulliparous than multiparous women is in accordance with those of Figueiredo and Conde (2011) reporting a significant rise in the level of anxiety symptoms from 3rd trimester to childbirth in nulliparous women versus a decline in multiparous (157). However, in the

first and second trimester and also after childbirth multiparous had experienced more anxiety than nulliparous women (157). Also, some others have reported more anxiety symptoms in multiparous women (58).

Totally, despite broad and profound studies that have been conducted on maternal psychological status, anxiety has not been explored as much as depression, particularly during pregnancy and respect to the parity. Given that our participants were in the third trimester, the higher anxiety in nulliparous mothers can be attributed to their difficulties in psychological and physiological adjustment needed for childbirth as an unknown event that they have to address it, and more importantly, the transition to the motherhood (157).

In relation to the predictors of each domain of HRQOL, depression was identified to be the most common predictor for the various HRQOL dimensions in both groups. Furthermore, the anxiety factor contributed to the poorer HRQOL in domains Depression, Fatigue, and Pain interference in nulliparous, and Sleep disturbance, Depression, and Pain interference in multiparous women. It seems that associated psychological factors with HRQOL are relatively similar in nulliparous and multiparous women.

Several kinds of literature have highlighted the role of depressive mood and anxiety in diminishing HRQOL during pregnancy (82,89,158). In a study of Da Costa et al (2010), depression emerged as a significant contributor for lower HRQOL in domains bodily pain, general health, vitality, social functioning, emotional role, and mental health (89). Additionally, higher pregnancy-related anxiety was associated with lower physical functioning and role limitations due to physical health problems (89). Likewise, another cross-sectional survey (2015) carried out on Chinese pregnant women in late pregnancy reported a significant poorer HRQOL in all domains assessed through SF36 in compared to those without it (159).

Findings of the relationship between obstetric factors on HRQOL were interestingly different in nulliparous and multiparous women. In nulliparous women no any factor significantly predicts HRQOL domains. On the contrary, in multiparous gestational age was negatively associated with the Fatigue domain, wanted pregnancy and previous emergency cesarean were contributors for the lower and higher pain intensity domain, respectively. A variety of results have been suggested by different studies in this area. Azizi (2016) observed a significantly lower score in all domains of SF36 in unwanted pregnancy group versus wanted one. Unwanted pregnancy was a stronger predictor for mental domains than for physical ones (160). Adversely, we did not observe any relationship with the psychological domain. On the other hand, Gariepy et al, (2017) did not obtain a significant association between pregnancy context and mental and physical HRQOL measuring using PROMIS-GSF after adjusting for confounding variables. Pregnancy context consisted of pregnancy wantedness, intention, and planning (86).

Moreover, in the study of Da costa (2010), only complicated pregnancy was a negative significant determinant of physical and social functioning (89). In relation to the birth mode, Emmanuel and Sun (2013) pointed out that women with normal vaginal birth had a better physical functioning, and also lower bodily pain than those with cesarean delivery at 6 and 12 weeks postpartum (161). Given that we assessed the relationship between previous delivery mode and HRQOL in the current pregnancy, it sounds that cesarean particularly emergency cesarean can have a long-lasting effectual role in impairing HRQOL in the domain of bodily pain intensity perceived by multiparous women.

In our study, receiving social support from friend and family was a contributor to improving HRQOL in domains Depression and Fatigue. While Da costa et al, (2010) did not reveal any link between social support and HRQOL in late pregnancy (89), Elsenbruch et al, (2007) suggested a significant one between low social support and reduced scores of quality of life, and also decreased depressive symptomatology during pregnancy (162).

A role of moderator and mediator for beneficial effects of social support on reducing stress and enhancing well-being has been considered. It can result from the role of supporters in developing positive attitudes and skills, providing motivation for engagement in beneficial activities, and enabling function by enhancing self-efficacy (163).

In terms of socio-demographic factors, all of them were unrelated to the HRQOL except for partner's age that was a predictor for lower Ability to participate in social roles in nulliparous, and also lower pain interference and intensity in multiparous. Some others showed relatively different results (83,89,161).

Overall, in the present study, although most pregnant women showed a rather optimal level of HRQOL, domains physical function, depression, and anxiety still need further consideration. The continuous assessment of psychological status and even the levels of physical function and activity over the course of pregnancy may optimize the HRQOL of pregnant women and ameliorate pregnancy outcomes in Hungarian women.

5.1.4. The investigation of MFA and its predictors.

Our participants displayed a strong relationship with their fetus. The mean score of MFAS was 100.89 and 99.45 (max score is 120) in nulliparous and multiparous women, respectively with no significant difference between them.

Significant determinants were found in two groups. Whilst, MSPSS-FR, gestational age, and unwanted pregnancy could significantly predict higher MFA in the nulliparous group, in multiparous women greater MFA was predicted by only MSPSS-FR. Depression and anxiety, the previous mode of birth, birth experience, and history of breastfeeding (in multiparous women) did not significantly correlate with the MFA.

Our results assert other ones showing strong MFA in late pregnancy. Larissa et al (2017) revealed that bonding to the fetus increases over the first trimester to the late pregnancy and remains strongest in the postnatal period. The high quality and intensity of prenatal attachment was a significant predictor for the higher maternal attachment to the newborn, postnatally (164). This finding evidences the importance of prenatal maternal-fetal relationship in developing mother-infant attachment which eventually would lead to the secure or insecure attachment style in adulthood (108,109).

 In consistence with our results of predicting factors for MFA, a meta-analysis conducted on 183 studies of MFA introduced social support as the most powerful theoretical predictor and adversely, anxiety and depression as the weakest one (120). Additionally, gestational age showed the highest effect size amongst all predictors, confirming the progressive nature of MFA. On the contrary, planned pregnancy and parity connected to the MFA very weakly. Socio-demographic factors, as well, did not show any important role in predicting MFA (120).

All of these findings provide insight into the reason for developing a prenatal care guideline with respect to monitoring the level of social support that mothers perceive during pregnancy.

Regarding the relationship between the previous mode of birth, birth experience, and the history of breastfeeding and MFA, we failed to find any study that evaluated the link between these factors and MFA in the current pregnancy. A growing body of literature has evidenced either contributing breastfeeding during infancy in forming attachment style in offspring (165) or mother's attachment style in initiation and duration of breastfeeding (166). Although our results were not yielded in any significant association between the previous mode of birth, birth experience, and history of breastfeeding and MFA, designing more precise studies are warranted to help fill this gap in the literature. In particular, in relation to the history of breastfeeding that may be engaged in the epigenetic transmission of OT.

5.1.5. The relationship between fear of childbirth and health-related quality of life

Our findings revealed that amongst FOC subscales, Isolation could significantly predict domains sleep disturbance in both groups, physical function and pain interference only in the nulliparous group. Moreover, subscale Fear emerged as the predicting factor for the higher score of anxiety and depression domains. Interestingly, subscale Moment of birth contributed to elevating physical function score in nulliparous women. Overall, subscales Isolation, Fear and Moment of birth emerged as significant predictors for different domains of HRQOL.

Sleep disturbance is one of the most frequent complaints among pregnant women that increases as pregnancy proceeds (167). Some common underlying causes behind sleep problems in late pregnancy include urinary frequency, nocturnal waking to void, difficulty getting comfortable, heartburn, restless sleep due to fetal movement, restless leg syndrome, and obstructive sleep apnea (168).

It has been postulated chronic sleep disturbances can cause the negative pregnancy outcomes like preeclampsia and gestational diabetes owing to the stress-related hypothalamic–pituitary–adrenal (HPA) axis and abnormal immune/inflammatory, reaction (169). Moreover, sleep deprivation (less than 6 hours) in late pregnancy accounted for a substantial increase in cesarean birth rate resulting from a long labor period (170).

With respect to the pathophysiology of sleep disturbance in times of stress, existing evidence posit a noticeable causative role for hyperactivity of the HPA axis. Accordingly, the increasing level of cortisol secretion in stressful conditions would lead to the increased nocturnal Corticotropin-releasing hormone (CRH) and central norepinephrine activity, resulting in sleep fragmentation, decreased slow wave sleep, shortened sleep time, and insomnia (171). On the other hand, it has been known that pregnant mother experiencing the high levels of stress and anxiety during pregnancy have the raised level of cortisol and consequently, a hyperactive HPA axis (172).

As has been noted in earlier sections, Isolation subscale has consisted of items that display fear of being left alone, losing self-control, behaving badly and of hopelessness, being frightened and panic during labor and childbirth. Having the feelings of panic and frightful obtained the highest score in this subscale. Therefore, it would be justifiable why women with the higher feelings of Isolation experience poorer level of HRQOL in sleep disturbance domain. Furthermore, this result ascertains the role of lack of sufficient awareness regarding labor and childbirth process and more importantly trust to the midwives/nurses and obstetricians in creating poorer HRQOL during pregnancy for both groups of nulliparous and multiparous.

Comparing to our results, Hall et al (2009) reported no significant association between hours of sleep and high, moderate, low levels, and the total score of fear of childbirth(59).

Although in the present study sleep disturbance was examined using 7 items as a domain of HRQOL and explained by just 14% and 13% of variance in nulliparous and multiparous groups, respectively, the obtained results are still worthy of notice. Given the deleterious effects of sleep disturbance and also severe fear of childbirth in pregnancy, conducting further studies is essential to more precisely fill the gaps in this area.

In addition to sleep disturbance, Isolation contributed to attenuating HRQOL in domains pain interference and physical function in nulliparous women.

Pain interference defines as the degree to which pain limits or interferes with individuals' physical, mental and social activities (173) that can be associated with a wide array of psychosocial and biological factors, sociocultural background and personal attitudes (174). Despite the growing number of documents evaluating the relationship between pain interference and psychological distress in different conditions like cancer, elderly, abuse exposures, studies have targeted pregnant women by this date.

Higher fatigue, distress, anxiety, PTSD, and depression symptoms are known as attributable factors to the higher level of pain interference in a different population of women (175,176).

Regarding pregnancy, two studies have conducted on pregnant women with lumbopelvic pain showed that fear-avoidance beliefs (177) and catastrophizing (177,178) could significantly contribute to pain interference. Another study linked the experience of moderate or extreme pain and/or discomfort in the second trimester with the levels of fear of childbirth in late pregnancy (179).

In our study, Anxiety along with Isolation remained in the model after controlling confounders, explaining 17% of variance. Moreover, some results pointed to the role of self- efficacy in pain experience (180) and on the other hand, in strengthening fear of childbirth (23). Therefore, it is plausible that anxiety and self-efficacy mediate the relationship between Isolation and pain interference, however, we did not measure self-efficacy to confirm this effect in pregnancy.

Concerning physical function, some factors including depression, anxiety, self-esteem, body-image dissatisfaction, and stress level have been introduced to reduce physical function in pregnancy (181). In the current study, physical function was predicted only by Isolation and all confounders excluded from the model. Given that items compromising pain interference overlapping with physical function, it is not surprising to postulate the link between Isolation and physical function, in fact, results from levels of pain interference. Nevertheless, a path analysis is needed to explore direct and indirect relationships between fear of childbirth, pain interference, and physical function.

Altogether, findings of the relationship between Isolation and HRQOL domains highlight the potential importance of building confidence in care providers that they will receive sufficiently effective attention and care during labor and giving birth, particularly for nulliparous women. More investigations in this area are warranted.

5.1.6. Mother's birth circumstance and fear of childbirth and maternal-fetal attachment

This study is the first one to map the link between a pregnant women's fear of childbirth and her own birth circumstances with the possible role of exogenous OT in the background

We observed that in comparison with women born without the administration of exogenous OT and amniotomy, higher scores were reached on W-DEQ A subscales 'Moment of birth', 'Fear', and 'Lack of positive emotions by women whose mother had recollections of receiving OT and amniotomy.

Participants' early experiences at birth did not reveal a significant link with FOC. Regarding breastfeeding during infancy, though participants who had been fed by mother milk for longer than 12 months obtained a notably lower score in subscales fear and moment of birth than those without breastfeeding. This difference was not significant. Likewise, MFA did not significantly associate with MBC.

Negative birth experiences due to medical interventions and emergency cesarean section have been documented to be responsible for FOC in the forthcoming pregnancy of mothers (44,54). For instance, women who receive exogenous OT for induction or augmentation of labor often have an experience of more intensive pain. Synthetic oxytocin cannot cross the blood-brain barrier and as a result, endogenous endorphins are not released to decrease pain perception and anxiety (182). Hence, higher scores on certain subscales of W-DEQ A in participants whose mothers had received medical interventions during labor and delivery suggests a molecular pathway in the background. One trajectory that could justify this relationship is internalizing mother's negative stories. Two studies conducted among Chinese (183) and Finnish (36) pregnant women have pointed out that listening to negative childbirth stories might act as a significant factor in developing FOC.

Another trajectory that can be considered is related to an anxiolytic feature of endogenous OT in reducing maternal fear and stress and afterward intergenerational transmission of maternal behavior.

Increasing number of human and animal studies support the role of endogenous OT in attenuating fear-related anxiety through the inhibition of the stress-induced activation of the HPA axis and the reduction of the amygdala activity (96, 98, 101).

Infusing OT receptor antagonists into the central amygdala to block oxytocin's effects resulted in an anxiogenic behavior in pregnant rats (103). On the other hand, certain studies called the attention to the possible fetal effects of exogenous OT administered in the perinatal period. For instance, a decreased amounts of face to face contact between mother and newborn in the first hour postpartum (184), weaker neonatal sucking reflexes (185), and interrupted pre-feeding (186) were observed in connection with labor induction by the administration of exogenous OT. Synthetic OT administered during labor seems to be able to alter physiological and emotional regulation in the mother which can be transmitted epigenetically from mother to offspring (187).

Given that in our study, performing amniotomy and OT induction in mothers were significantly associated with FOC in their daughters, the tentative long-term effect of insufficient level of endogenous OT and/or OT receptor on the psychological and emotional development of offspring could be concluded. Furthermore, we found that mothers who had experienced amniotomy and OT induction during labor had a shorter duration of breastfeeding in postpartum. Although it was not significant, could consider as a noticeable evidence in line with findings mentioned above, needing further investigations.

A good deal of attention should be given to the role of other hormones and their receptor systems, (such as cortisol, estrogen, progesterone, endogenous opioids) in maternal neuropsychological health

and their interaction with OT (188). Furthermore, basic individual differences and previous and current maternal experiences should be taken into account (189).

In relation to early experiences and breastfeeding, we did not gain significant results. However, subscales Fear and Moment of birth were markedly lower in participants who had fed longer than one year by their mother's milk than others. In odds with current results, the positive impacts of early contacts such as skin-to-skin, eye contact, touching and verbal cues between mother and newborn in activation OT system has been noted by several documents (190). Early separation can be stressful for newborn causing some negative consequences on neuroendocrine function and adult maternal behavior (191). Recent animal studies have revealed some alterations in newborn's gene expression due to a deficient interaction between estrogen and estrogen receptors in case of early separation which can have long-term or even intergenerational effects (192).

Regarding breastfeeding, when we examined the contributing of the previous breastfeeding in the prediction of scores of W-DEQ A in current pregnancy among multiparous women, a negative and significant link was found between duration of breastfeeding and subscales Isolation and Fear. After adjusting for confounders, not having a history of breastfeeding in previous birth significantly linked with subscale Isolation.

Integrating these results show that although this study could not directly confirm the intergenerational transmission of OT in the link between breastfeeding and the level of FOC as an effective background of reproductive behavior, this relationship in one generation is noteworthy to be argued.

The increased level of OT during breastfeeding and also more positive mood and lower aggression and depression in lactating women have been well known (193). Given the role of OT in impairing fear acquisition and extinction consolidation (96), it would be reasonable to assume that lactating

mothers are less prone to memorize fear and negative birth experience in compare to non-breastfeeding ones. Obviously, longer duration of lactation would be further effective in long-time.

Another explanation for the effectiveness of the previous breastfeeding on FOC in current pregnancy can be attributed to some mother's psychological features like self-efficacy. Self-efficacy plays a notable role in both successful childbirth and breastfeeding. Efficacious mothers are more inclined to choose breastfeeding and capable to resist difficulties through developing further self- encouraging thoughts (194). Experiencing a successful and enduring breastfeeding could be impressive in building up the higher level of self-efficacy in the subsequent childbirth leading to the reduced level of fear. The relationship between the higher level of self-efficacy and lower level of anxiety and fear has been frequently reported (21–23). With respect to the broad and profound role of OT in the regulation of different emotions and psychological traits, its contribution to developing stronger self-efficacy should be assumed. Nevertheless, this assumption might appear speculative owe to the lack of empirical evidence.

The most noticeable result of this section was a significant relationship between amniotomy and OT induction as the most common medical intervention during labor and increased FOC in offsprings. This important relationship, on the one hand, highlights the possible role of insufficient plasma OT and/or OT receptor and its capability of transmitting to the next generation and affecting them negatively. On the other hand, this finding confirms the influence of the mother's negative birth experiences on elevating the level of FOC in their daughters. In addition, the significant impact of lactation in decreasing the level of FOC in subsequent pregnancy underlines the long-lasting role of OT in managing emotions and building up positive features in mothers.

5.2. Strength and limitation

One limitation of this project is linked to the inclusion criteria. Only healthy pregnant women included in this study. Thus, our results, particularly in relation to the HRQOL section, are not generalizable to women with medical problems. Moreover, it was not possible to determine cases with the intense levels of fear through clinical interview using diagnostic tests. Because of this, we only were able to determine a cut-point based on the statistical method.

In addition, regarding mother's birth circumstances, certain obstetric practices such as EDA, skin-to-skin contact with the mother, rooming-in, and father's presence at birth were not common at the time when participants were born. Therefore, the rate of negative answers to these items was relatively high, resulting in a non-significant relationship. Also, fading memories of childbirth might have led to recall bias.

On the other hand, some principle novelties of this project should be considered. Firstly, this study examined fear of childbirth based on WDEQ-A subscales by parity. This new approach helped us to develop deeper insight into the different factors forming fear of birth and obtain precise and detailed information on some of its predisposing factors. Secondly, evaluating different domains of HRQOL using PROMIS as one of the most reliable tools for applying during pregnancy that has been calibrated for the Hungarian population is another remarkable positive point. More importantly, considering the pregnant women's own birth in the examination of intergenerational transmission of an effective component of reproductive behavior in humans, likely through an epigenetic mechanism, was the most prominent aspect of this project that presents a new scientific approach for future studies.

In addition, both nulliparous and multiparous women were involved and analyzed separately in most sections, providing sufficient evidence for each group for using in the clinical and research settings.

Besides, a relatively high response rate of 92% decreased substantially the risk of response bias. Moreover, the participants were pregnant women attending the NST lab where coming from different levels of socio-economic status. Because of this, our sample was a good representative of the Hungarian pregnant population.

5.3. Clinical implication

Given to the obtained results from assessing fear of childbirth that was the most important concern in this project, the following strategies for reducing it should be taken into account.

First of all, educating midwives and obstetricians about symptoms, risk factors, and other different aspects of fear of childbirth and making them sensitive to this common psychological problem is a fundamental measure that should be carried out. Secondly, implementing preventive strategies to detect women with a severe level of fear in early pregnancy would be helpful. In this way, maternity caregivers could provide a required platform for pregnant women to discuss their feelings and expectations of childbirth. Assuring mothers that they will be sufficiently cared for and supported during labor is also very important in alleviating the fear of being left alone and of losing control. Thirdly, regarding the subject of coping with labor pain, providing a continuous supporting care particularly by a midwife during labor has been pointed out to be significantly more helpful than using different types of medical pain relief like epidural analgesia. Therefore, the continuous presence of a supportive professional obviously also leads to a more positive experience of childbirth. Finally, continuing discussion after birth and talking with women about their childbirth process during postnatal visits may be beneficial to identify underlying causes of negative birth experience and amend its effects on the subsequent pregnancy and even on reproductive behavior in the next generation.

Since anxiety was recognized as the most consistent predictive factor for most HRQOL and FOC domains, designing screening programs at the early pregnancy, particularly for nulliparous women, seems to be required.

Paying attention to the mother's birth circumstances, especially in terms of received medical interventions during labor in their mothers, and also the history of breastfeeding in the previous childbirth for identifying mothers who are prone to perceive severe FOC should be considered. In addition, encouraging and educating women to develop a successful and sustainable lactation is a great importance to benefit from long-lasting emotional effects of breastfeeding.

5.4. Conclusion

The first section of this project using EFA and CFA revealed a valid and reliable Hungarian version of W-DEQ A with 30 items and 4 factors, confirming the multidimensionality of this instrument and being suitable for both nulliparous and multiparous women.

In the second section, Fear subscale of the WDEQ-A obtained the greatest mean score among other subscales in both groups. Besides, compared with the multiparous, the nulliparous group reached higher scores in Isolation and Lack of positive emotions. Predictors of subscales were different in each group except for anxiety, which was the most common predictor of subscales in both groups. Therefore, in order to achieve the most accurate and comprehensive insight into this phenomenon particular in planning interventional studies, various factors relating to each domain of fear of childbirth need to be considered.

In relation to the HRQOL, though most pregnant women showed a rather optimal level of HRQOL, domains physical function, fatigue, and anxiety need further consideration. Examining the relationship between FOC and HRQOL showed that subscale isolation can significantly be associated with sleep disturbance in both groups, physical function and pain interference only in the nulliparous

group, indicating the effectiveness of insufficient level of confidence in care providers and also self-efficacy on diminishing some domains of HRQOL during pregnancy.

Maternal-fetal attachment emerged to be strong in the entire of participants. MSPSS-FR was a common predictor in both groups, showing the importance of monitoring the level of social support that mothers perceive during pregnancy particularly from their friends.

In assessing the relationship between mother's birth circumstances and fear of childbirth, the most significant result was an association between recollections of the most common medical intervention during labor such as amniotomy and administration of exogenous OT, and increased scores on FOC subscales in the offsprings. This outstanding result firstly suggests the role of the mother's negative birth experiences in increasing FOC level in their daughters via internalizing mother's negative stories. Secondly, it highlights the tentative long-term effect of insufficient amount of endogenous OT level and/or OT receptors in the offspring and its capability of transmission to the next generation and affecting them negatively. Given to the aforementioned limitations of this section, there is a need for more precise investigations with longitudinal prospective design in order to fill the wide gap in existing knowledge in this regard and achieve a comprehensive consensus.

Lastly, a negative and significant link was found between the duration of breastfeeding and subscales isolation and fear. After adjusting for confounders, no history of breastfeeding in previous birth emerged to significantly influence on subscale isolation, underlining the long-lasting role of OT in managing emotions and building up positive features in mothers and warranting further investigations.

Publication list

Directly from the thesis

1- *MoghaddamHosseini V*, Makai A, Varga K, Ács P, Prémusz V, Várnagy Á. Assessing fear of childbirth and its predictors among Hungarian pregnant women using Wijma Delivery Expectancy/Experience Questionnaire subscales. Psychology, health & medicine. 2019 Jan 30:1-1.

2- *Vahideh MoghaddamHosseini*, Alexandra Makai, Diana Dweik, Ákos Várnagy. Factor analysis study of the Hungarian translation of Wijma Delivery Expectancy/Experience Questionnaire (version A), Current Psychology, 2018;1-8,

Other publications

3- *Vahideh MoghaddamHosseini*, Milad Nazarzadeh, Shayesteh Jahanfar. Interventions for reducing fear of childbirth: A systematic review and meta-analysis of clinical trials. Women and Birth 31 (4), 2018; 254-262

4- *Vahideh MoghaddamHossieni*, Jocelyn Toohill, Arash Akaberi, BibiMarzie HashemiAsl. Influence of intimate partner violence during pregnancy on fear of childbirth. Sexual & Reproductive Healthcare 14 (2017) 17–23.

Publication to be reviewed

- *Vahideh MoghaddamHosseini*, Alexandra Makai, Diana Dweik, Kiss István, Katalin Varga, Ákos Várnagy. Fear of childbirth in pregnant women might be rooted in their own birth circumstances – a retrospective study of intergenerational transmission.

- *Vahideh MoghaddamHosseini*, Alexandra Makai, Katalin Varga, Ákos Várnagy. The Assessment of Health-related Quality of Life and its Predictors Among Hungarian Pregnant Women Using the Patient-Reported Outcomes Measurement Information System.

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Figure 1: T-score rank of PROMIS-43 subscales in nuliparous women
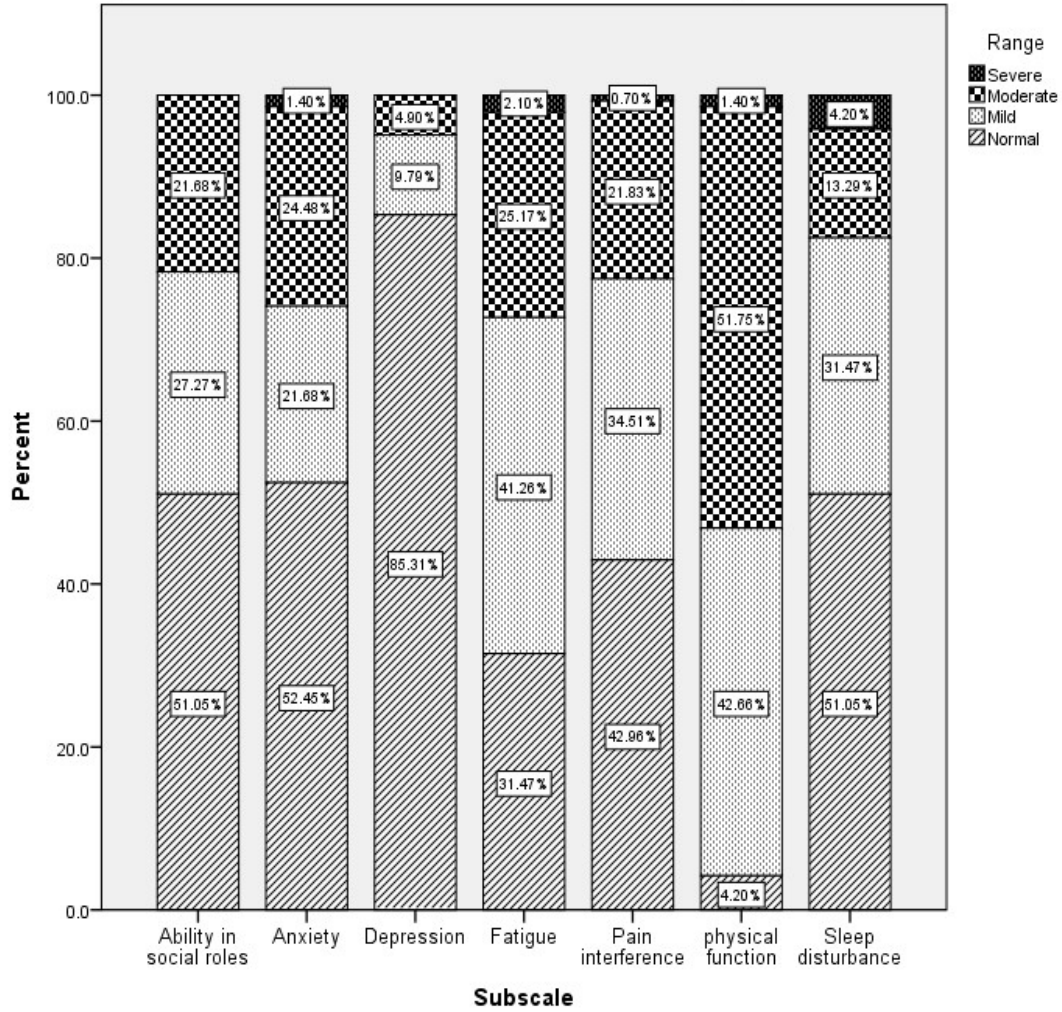
Figure 2: T-score rank of PROMIS-43 subscales in multiparous women
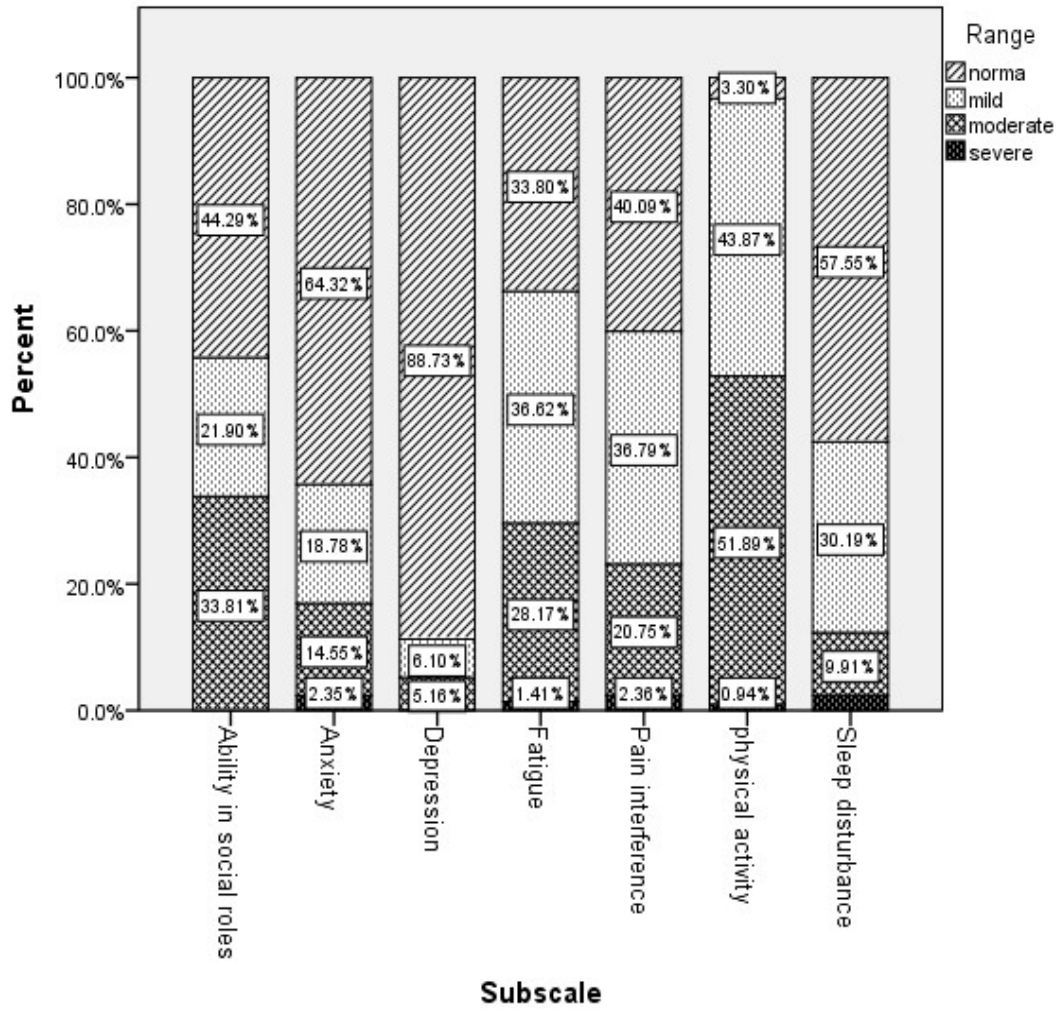
List of tables

Table 1: Participants' demographic and obstetric characteristics and mean BAI and BDI-SF scores according to parity differences. (N=361)

Socio-demographic characteristics	Total n(%)	Multiparous n(%)	Nulliparous n(%)	parity difference	
Age (Mean± SD)	32.41±5.32	33.9±5.07	30.23±4.85	**Z=-6.27**	**P=0.00**
Education					
Low	18(5.0)	11(5.1)	7(4.9)		
Intermediate	154(42.9)	92(42.8)	62(43.1)	χ2 =0.01	P=0.99
High	187(52.1)	112(52.1)	75(52.1)		
Employment status					
full time	298(80.7)	169(79.0)	120(83.3)		
Part time	7(2.0)	6(2.8)	1(0.7)		
Self-employed	28(7.8)	20(9.3)	8(5.6)	χ2 =3.72	P=0.29[f]
Housewife	34(9.5)	19(8.9)	15(10.4)		
Marital status					
Married	222(62.0)	142(66.0)	80(55.9)		
cohabiting	128(35.8)	68(31.6)	60(42.0)	χ2 =4.02	P=0.13[f]
Single/divorced/widow	8(2.5)	5(2.3)	3(2.1)		
Place of residence					
Urban	134(37.5)	76(35.3)	58(40.8)		
rural	132(36.7)	7836.3)	53(37.3)	χ2 =2.13	P=0.34
suburb	92(25.8)	61(28.4)	31(21.8)		
Economic hardship					
Yes	75(21.5)	42(19.7)	33(23.1)	χ2 =0.58	P=0.44
No	281(78.9)	171(80.3)	110(76.9)		
Obstetrics characteristics					
Gestational age (Mean± SD)	36.98±1.25	36.93±1.35	36.96±1.21	Z= - 0.85	P=0.39
Parity					
Nulliparous	144(40.1)				
Multiparous	215(59.9)				
Pregnancy Status					
Wanted	316(88.5)	186(86.9)	130(90.9)	χ2 =1.34	P=0.24
Unwanted	41(11.5)	28(13.1)	13(9.1)		
History of miscarriage					
Yes	109(30.4)	99(46.0)	10(7.0)	**χ2 =61.85**	**P=0.00**
No	249(69.6)	116(54.0)	133(93.0)		
Preferred delivery mode					
Normal vaginal delivery	280(86.7)	179(86.9)	101(86.3)	χ2 =0.021	P=0.88
cesarean section	43(13.3)	27(13.1)	16(13.7)		
The mode of last birth (for multiparous)					
Normal vaginal delivery	118(63.8)				
Emergency cesarean section	27(14.6)				
Elective cesarean section	5(2.7)				
Cesarean section due to medical indication	35(18.9)				
last delivery Experience (for multiparous)					
Positive	142(76.3)				
Negative	44(23.7)				
Breastfeeding in the last birth					
No	12(7.5)				
Less than 6 months	49(30.8)				
6-12 months	43(27.0)				
More than 12 months	55(34.6)				
Psychological characteristics and social support					
Depression					
BDI-SF[1](Mean± SD)	4.25±3.60	4.22±3.30	4.34±3.74	Z=-0.22	P=0.82
Anxiety					
BAI[2] (Mean± SD)	10.91±9.30	10.71±9.05	11.14±9.62	Z=-0.16	P=0.86
Social support					
PSSMS[3] (Mean± SD)	6.39±1.00	6.34±1.10	6.49±0.83	Z=-1.14	P=0.25

F: Fisher Exact test.　1. Beck Depression Inventory-Short Form　2. Beck Anxiety Inventory　3. Multidimensional Scale of Perceived Social Support

Table 2: Summary of the results of the exploratory factor analysis of the Hungarian version of W-DEQ A. (N=343)

Items	Factors			
	1 Isolation	2 Lack of positive emotions	3 Moment of birth	4 Fear
11 Desolate	.923			
15 Abandoned	.910			
3 Lonely	.897			
20 Hopelessness	.881			
31 Dangerous	.842			
27 Totally Lose Control	.791			
25 Behave Badly	.696			
8 Weak	.694			
19 Panic	.613			
2 Frightful	.584			
17 Relaxed		.792		
5 Confident		.790		
13 Glad		.787		
22 Self-Confidence		.768		
16 Composed		.740		
4 Strong		.729		
10 Independent		.699		
9 Safe		.645		
1 Fantastic		.634		
23 Trust		.599		
14 Proud		.525		
28 Enjoyable			.850	
24 Natural			.820	
30 As Should Be			.793	
21 Longing for The Child			.759	
18 Happy			.619	
6 Afraid				.812
12 Tense				.736
7 Deserted				.691
24 Pain				.599
Eigenvalues	9.34	6.78	2.08	1.77
% of variance	28.31	48.88	55.19	60.56
Cronbach's α	.94	.91	.84	.81

Table 3: Goodness-of-fit indicators for W-DEQ A and its four-factor models from CF. (N=343)

Model	Chi square	df	Chi square/df	RMSEA	CI RMSEA lower	CI RMSEA Upper	CFI	TLI
Wijma et al (1998) One factor	5156.513	495	10.417	.166	.162	.170	.405	.366
Johnson & Slade (2002)	2516.346	434	5.798	.141	.141	.153	.513	.546
Takegata et al (2013)	2679.262	495	5.413	.141	.136	.146	.520	.550
Pallant et al (2016)	1299.898	324	4.012	.116	.110	.123	.728	.749
Hungarian version (n=343)	1118.406	378	2.959	.076	.071	.081	.90	.885

RMSEA: root means square error of approximation, CFI: comparative fit index, TLI: tucker-lewis index

Table 4: Concurrent/convergent validity of BAI, BDI-SF and W-DEQ A and its factors. (N=343)

Measures	W-DEQ A	
	R[*]	P
BAI[1]		
Isolation	.21	.00
lack of positive emotions	.32	.000
Moment of birth	.32	.000
Fear	.16	.02
WDEQ- A[2]	.24	.00
BDI-SF[3]		
Isolation	.07	.28
lack of positive emotions	.23	.00
Moment of birth	.18	.00
Fear	.06	.32
WDEQ- A[1]	.15	.00

* Spearman correlation coefficient results

1- BAI: Beck Anxiety Inventory,
2- BDI-SF: Beck Depression Inventory-Short Form
3. W-DEQ: Wijma Delivery Expectancy/Experience Questionnaire

Table 5: The Mean values of items forming four factors of W-DEQ A in nulliparous and multiparous women. (N=361)

Items	Isolation (Mean± SD)		Lack of positive emotions (Mean± SD)		Moment of birth (Mean± SD)		Fear (Mean± SD)	
	nulliparous	multiparous	nulliparous	multiparous	nulliparous	multiparous	nulliparous	multiparous
Desolate	1.82±1.84	1.64±1.92						
Abandoned	1.96±1.93	1.65±1.90						
Lonely	1.62±1.95	1.35±1.86						
Hopelessness	2.22±1.76	2.03±1.92						
Dangerous	1.79±1.82	1.71±1.90						
Lose Control	2.58±1.55	2.12±1.87						
Behave Badly	2.56±1.48	2.12±1.86						
Weak	2.38±1.31	2.51±1.59						
Panic	2.65±1.29	2.50±1.70						
Frightful	2.46±1.28	2.09±1.60						
Relaxed			2.89±1.21	2.45±1.40				
Confident			2.75±1.00	2.40±1.13				
Glad			2.66±1.13	2.49±1.25				
Self- Confidence			2.34±1.10	2.06±1.18				
Composed			2.33±1.08	2.12±1.22				
Strong			2.44±1.09	2.25±1.28				
Independent			2.99±0.98	2.70±1.15				
Safe			2.17±1.26	1.87±1.38				
Fantastic			2.91±1.14	2.71±1.19				
Trust			1.67±1.07	1.57±1.18				
Proud			1.57±1.36	1.64±1.34				
Enjoyable					0.66±1.04	0.78±1.19		
Natural					0.96±1.17	1.05±1.29		
As should be					1.01±1.08	1.04±1.38		
Longing for the child					0.69±1.02	0.78±1.16		
Happy					1.50±1.30	1.57±1.30		
Afraid							2.86±1.26	2.82±1.52
Tense							2.61±1.35	2.59±1.60
Deserted							2.67±1.40	.266±1.67
Pain							2.73±1.27	.274±1.45

Table 6: Differences between and within groups of W-DEQ A subscales in a range from 0 to 100 according to the parity. (N=361)

Subscale	Nulliparous		Multiparous		Z	P
	Mean	SD	Mean	SD		
Isolation	44.71	19.51	39.81	21.854	-2.39	0.017
Lack of positive emotion	48.31	16.00	44.42	18.83	-2.15	0.013
Moment of birth	19.22	17.96	20.92	20.76	-0.40	0.68
Fear	54.71	18.80	54.22	22.32	-0.27	0.78
Friedman test	$\chi2$ =329.96 P=0.00		$\chi2$ =227.53 P=0.00			

Table 7: Descriptive statistics for the high level of WDEQ- A subscales in the total of participants. (N=361)

	WDEQ- A subscales			
	Isolation	Lack of positive emotion	Moment of birth	Fear
Mean± SD	42.54± 20.73	46.59± 17.41	19.97± 19.26	54.45± 20.41
n (%) of cases with the high level of fear	72 (17.70)	52 (12.60)	56 (13.30)	79 (19.00)

Table 8: Predictors for each W-DEQ A subscale according to the parity. (Only significant results are presented) (N=361)

Factors	Nulliparous				Multiparous			
	Isolation	Lack of positive emotion	Moment of birth	Fear	Isolation	Lack of positive emotion	Moment of birth	Fear
	B (95%CI)	B (95%CI)	B (95%CI)	B (95%CI)	B(95%CI)	B (95%CI)	B (95%CI)	B (95%CI)
Having economic hardship			7.88** (2.32,13.44)					
Job-Housewife				15.34** (4.79,25.90)				-17.00** (-28.90, -5.10)
Marital status-Married					-13.02** (-19.95, -6.09)			
Anxiety	0.50** (0.20,0.80)	0.50* (0.26,0.74)	0.42** (0.18,0.66)	0.47** (0.20,0.74)		0.98** (0.69,1.27)	0.72** (0.38,1.06)	0.60** (0.22,0.98)
Depression					2.79** (1.73,3.61)			
Wanted pregnancy		-7.92** (-14.80, -1.05)						
Negative experience of last delivery					7.88* (0.33,15.43)			
Last type of delivery, Normal vaginal						-10.43** (-15.94, -4.92)		
Last type of delivery, CS elective						-24.28* (-43.56, -5.00)		
Constants	38.77	49.38	11.88	47.79	32.81	41.46	12.82	49.45
R^2	0.054	0.118	0.100	0.092	0.208	0.278	0.097	0.085
F	10.83	12.81	10.83	9.91	13.93	20.80	17.790	7.52

* $P<0.05$, ** $P<0.01$

Table 9: Differences in T- score means of PROMIS-43 subscales by parity. (N=361)

Subscale	Nulliparous		Multiparous		Z	P
	Mean	SD	Mean	SD		
Sleep disturbance	54.99	6.50	54.21	6.05	-1.29	0.20
Depression	47.09	7.80	46.40	7.42	-0.78	0.44
Physical function	39.30	3.98	39.46	4.36	-0.40	0.69
Fatigue	57.21	5.96	56.57	6.86	-0.29	0.77
Anxiety	55.15	7.39	53.08	7.88	-2.68	**0.007**
Ability to Participate in social roles	48.23	8.42	46.60	8.56	-1.85	0.06
Pain interference	53.83	7.79	53.84	8.37	-0.06	0.95
Pain intensity	2.76	2.00	3.01	2.07	-1.14	0.25

Table 10: Differences in T- score rank of PROMIS-43 subscales by parity. (N=361)

Subscale	Nulliparous n(%)	Multiparous n(%)	Parity difference
Sleep disturbance			
Normal	73(51.0)	122(57.5)	
Mild	45(31.5)	64(30.2)	$\chi2 = 2.50$ P= 0.50
Moderate	19(13.3)	21(9.9)	
Severe	6(4.2)	5(2.4)	
Depression			
Normal	122(85.3)	189(88.7)	
Mild	12(9.8)	13(6.1)	$\chi2 = 1.7$ P=0.43
Moderate	7(4.9)	11(5.2)	
Physical function			
Normal	6(4.2)	7(3.3)	
Mild	61(42.7)	93(43.9)	$\chi2 = 0.37$ P= 0.94[F]
Moderate	74(51.7)	110(51.9)	
Severe	2(1.4)	2(0.9)	
Anxiety			
Normal	75(52.4)	137(64.3)	
Mild	31(21.7)	40(18.8)	$\chi2 = 7.32$ P= 0.06
Moderate	35(24.5)	31(14.6)	
Severe	2(1.4)	5(2.3)	
Fatigue			
Normal	45(31.5)	72(33.8)	
Mild	59(41.3)	78(36.6)	$\chi2 = 1.14$ P= 0.76
Moderate	36(25.2)	60(28.2)	
Severe	3(2.1)	3(1.4)	
Ability to Participate in social roles			
Normal	73(51.0)	93(44.3)	
Mild	39(27.3)	46(21.9)	$\chi2 = 6.17$ **P=0.04**
Moderate	31(21.7)	71(33.8)	
Pain interference			
Normal	61(43.0)	85(4.1)	
Mild	49(34.5)	78(36.8)	$\chi2 = 1.71$ P=0.70
Moderate	31(21.8)	44(20.8)	
Severe	1(0.7)	5(2.4)	

Table 11: Significant association factors of each PROMIS-43 subscale in the nulliparous group. (N=144)

Factor	Sleep disturbance	Depression	Physical function	Fatigue	Anxiety	Ability to Participate in Social Roles and Activities	Pain interference	Pain intensity
Anxiety	r= 0.24**	r= 0.44**		r= 0.46**		r=- 0.18*	r= 0.43**	r= 0.39**
Depression	r[4]= 0.30**		r= 0.07**	r= 0.38**	r= 0.43**	r=- 0.21*	r= 0.37**	r= 0.33**
MSPSS-FR[1]		r = -0.22**		r= -0.28**				r= -0.18*
MSPSS-FAM[2]	r= -0.17*	r= -0.20*		r= -0.21**	r= -0.22**			r= -0.19*
MSPSS-SO[3]	r= -0.31**	r= -0.37**		r= -0.25**	r= -0.28**			r= -0.25**
Women's age		r= -0.18*						
Partner's age						r= -0.20*		
Gestational age					r = -0.18*			
Women's education			χ^2 = 11.13*					
Women's employment status	χ^2 = 13.70**							
Economic hardship	z = -2.74**	z = -2.26*					z = -2.34*	

* $P<0.05$
**$P<0.01$
1. Multidimensional Scale of Perceived Social Support-Friend   2. Multidimensional Scale of Perceived Social Support –Family
3. Multidimensional Scale of Perceived Social Support- Significant others
4. Spearman correlation coefficient

Table 12: Significant association factors of each PROMIS-43 subscale in multiparous group. (N=213)

Factor	Sleep disturbance	Depression	Physical function	Fatigue	Anxiety	Ability in participants in social roles	Pain interference	Pain intensity
Anxiety	r= 0.27**	r= 0.44**		r= 0.35**			r= 0.33**	r= 0.34**
Depression	r^4= 0.29**		r= 0.20**	r= 0.54**	r= 0.58**	r=- 0.13*	r= 0.40**	r= -0.34**
MSPSS-FR[1]		r = -0.35**		r= -0.25**	r= -0.23**	r= 0.16*	r= -0.27**	r= -0.25**
MSPSS-FAM[2]		r= -0.34**		r= -0.26**	r= -0.22**			r= -0.24**
MSPSS-SO[3]		r= -0.29**			r= -0.14*		r= -0.18**	
Women's age								r= -0.15*
Partner's age							r= -0.20**	r= -0.22**
Gestational age				r= -0.19**				
Women's education								χ^2 = 15.01**
Economic hardship		z = -2.56*						
Wanted pregnancy	z = -2.05*	z = -3.13**						z = -3.16*
Partner's education								χ^2 = 15.31*
History of miscarriage					z = -2.22*			
Last mode of birth								χ^2 = 9.10*

* $P<0.05$
**$P<0.01$
1. Multidimensional Scale of Perceived Social Support-Friend   2. Multidimensional Scale of Perceived Social Support –Family
3. Multidimensional Scale of Perceived Social Support- Significant others
4. Spearman correlation coefficient

Table 13: Predictors for each PROMIS-43 subscale for the nulliparous group. (Only significant results are presented) (N=144)

Factor	Sleep disturbance	Depression	Fatigue	Anxiety	Ability in participants in social roles	Pain interference	Pain intensity
	B (95%CI)	B (95%CI)	B (95%CI)	B (95%CI)	B (95%CI)	B (95%CI)	B (95%CI)
Depression	0.42** (0.12,0.71)		0.32* (0.01,0.63)	0.89** (0.60,1.18)	-0.42* (-0.82, -0.01)	0.45* (0.40,0.86)	
Anxiety		0.355*8 (0.21,0.49)	0.20** (0.07,0.33)			0.21* (0.04,0.39)	0.08** (0.04,0.12)
MSPSS-SO[1]		-4.07** (-6.67, -1.48)					-1.03** (-1.73, -0.33)
MSPSS-FR[2]			-1.48** (-2.43, - 0.53)				0.60** (0.22,0.98)
Partner's age					-0.38** (-067, -0.10)		
Constants	53.36	70.52	62.73	51.34	62.33	49.63	8.93
R²	0.062	0.266	0.298	0.209	0.308	0.169	0.225
F	8.032	22.09	17.01	36.38	5.34	12.28	17.40

* P<0.05, **P<0.01   1. Multidimensional Scale of Perceived Social Support (significant other)
2. Multidimensional Scale of Perceived Social Support (friend)

Table 14: Predictors for each PROMIS-43 subscale for the multiparous group. (Only significant results are presented) (N=213)

Factor	Sleep disturbance	Depression	Fatigue	Anxiety	Physical function	Ability in participants in social roles	Pain interference	Pain intensity
	B (95%CI)	B (95%CI)	B (95%CI)	B (95%CI)	B (95%CI)	B (95%CI)	B (95%CI)	B (95%CI)
Depression			0.94** (0.70, -1.61)	1.33** (1.07,1.58)	-0.20** (-0.38, -0.03)	-0.36* (-0.71, -0.02)	0.82** (0.45,1.18)	
Anxiety	0.16** (0.07,0.25)	0.27** (0.17,0.38)						0.05* (0.02,0.08)
MSPSS-FR[1]		-1.49** (-2.28, -0.70)						
MSPSS-FAM[2]			-0.40* (-0.80, -0.01)					
Partner's age							-0.30** (-0.50, -0.09)	-0.05* (-0.10, -0.001)
Gestational age			-0.90* (-1.61, -0.20)					
Wanted pregnancy								-1.33** (-2.27, -0.39)
Last mode of birth, emergency CS								1.26* (0.26,2.26)
Constants	52.56	52.46	88.85	47.46	40.34	48.01	61.30	5.19
R²	0.064	0.221	0.31	0.33	0.026	0.022	0.167	0.50
F	12.09	25.35	27.09	102.85	5.57	4.53	14.98	9.31

1. Multidimensional Scale of Perceived Social Support (friend)   2. Multidimensional Scale of Perceived Social Support (family)
* P<0.05,   **P<0.01

Table 15: Predictors for MFA in nulliparous and multiparous groups. (Only significant results are presented) (361)

Factor	Nulliparous	Multiparous
	B (95%CI)	B (95%CI)
MSPSS-FR[1]	2.32**(0.56, 3.65)	2.31**(1.14, 3.48)
Gestational age	1.57*(0.37, 2.77)	-
Wanted pregnancy	-6.11*(-11.45, -.77)	-
Constants	34.04	85.59
R^2	0.135	0.74
F	6.86	15.27

* $P<0.05$, ** $P<0.01$ 1. Multidimensional Scale of Perceived Social Support (friend)

Table 16: Frequency of mother's birth circumstances items (based on the recollections of their mothers). (N=361)

Date of birth *n*(%)			
Full term	231(64.5)		
Preterm	42(11.7)		
Post term	57(15.9)		
I do not know	28(7.8)		
Mode of birth *n*(%)			
Vaginal delivery	308 (85.8)		
Elective Cesarean section	36 (10.0)		
Emergency Cesarean section	13 (3.6)		
I do not know	2 (0.6)		
Medical interventions	**Yes** *n*(%)	**No** *n*(%)	**I do not know** *n*(%)
Episiotomy	182 (59.1)	47(15,3)	79 (25,6)
Amniotomy	71 (20.7)	113 (32.9)	159 (46.4)
Instrumental delivery	19 (5.7)	204 (61.3)	110(33.0)
Epidural anesthesia	70(20.6)	200(58.9)	69(20.5)
Oxytocin administration	40(11.8)	186(54.7)	114(33.5)
Early experiences			
Father present at labor and delivery	22(6.3)	279(80.4)	46(13.3)
Immediate skin-to-skin contact with mother after birth	54(15.5)	129(37.1)	165(47.4)
Having been breastfed in the first few hours after birth	83(24.1)	85(24.6)	177(51.3)
Rooming-in with mother during the hospital stay	46(13.3)	167(48.4)	132(38.3)
Having been breastfed during infancy for an unknown period	10(2.9)	3(0.9)	80(23.3)
Having been breastfed for less than 6 months	133(38.7)		
Having been breastfed for 6-12 months	93(27.0)		
Having been breastfed for more than 12 months	25(7.3)		

1. Cesarean Section
2. Epidural Analgesia
3. Oxytocin
4. Those women who responded only yes and did not know the duration of breastfeeding.

Table 17: Crud and adjusted significant results of the effect of childbirth fear on health-related quality of life in the nulliparous group. (N=140)

Variables	Crude results β (95%CI)			Adjusted results β (95%CI)		
	Sleep disturbance	Physical function	Pain interference	Sleep disturbance	Physical function	Pain interference
Isolation	0.24** (0.08, 0.44)	- 0.24* (- 0.32, -0.00)	0.27** (0.13, 0.55)	0.28** (0.11, 0.48)	-0.22* (-0.28, -0.02)	0.22* (0.10, 0.41)
Moment of birth		0.22* (0.12, 1.90)			0.27** (0.07, 0.43)	
Anxiety[1]						0.29** (0.10, 0.41)
R^2	0.05	0.05	0.07	0.10	0.07	0.17

1. As a confounder measured by Beck Anxiety Inventory that remained in the model.   * $P<0.05$, ** $P<0.01$

Table 18: Crud and adjusted significant results of the effect of childbirth fear on health-related quality of life in the multiparous group. (N=215)

Variables	Crude results β (95%CI)			Adjusted results β (95%CI)		
	Sleep disturbance	Depression	Anxiety	Sleep disturbance	Depression	Anxiety
Isolation	0.30** (0.14, 0.37)	0.29** (0.16, 0.45)		0.35 (0.17, 0.41)		
Moment of birth			0.14* (0.01, 0.58)			
Fear			0.38** (0.52, 1.08)		0.17 (0.03, 0.61)	0.24 (0.26, 0.75)
MSPSS-SO[1]					-0.21** (-3.28, - 0.76)	
Depression[2]						0.50** (0.88, 1.44)
Anxiety[3]					0.35** (0.15, 0.40)	
R^2	0.09	0.08	0.21	0.12	0.26	0.42

* $P<0.05$, ** $P<0.01$

1. Multidimensional Scale of Perceived Social Support-Significant others
2. As a confounder measured by Beck Depression Inventory-Short Form that remained in the model.
3. As a confounder measured by Beck Anxiety Inventory that remained in the model.

Table 19: Relationship between mother's birth circumstances and fear of childbirth subscales. (N= 316)

Variable	Lack of positive emotion		Moment of birth		Fear		Isolation		Maternal-fetal attachment	
	Mean rank	Median	Mean rank	Median	Mean rank	Median	Mean rank	Median	Mean rank	Median
Date of birth										
In-term	166.56	27.00	160.85	3.00	162.34	9.00	160.85	13.00	156.91	102.00
Pre-term	155.71	27.00	160.28	3.50	152.00	8.00	150.99	14.00	151.31	100.00
Post-term	156.87	26.00	173.52	4.00	153.45	9.00	148.78	13.00	140.72	99.00
Bivariate test (χ^2)	.0.80		0.87		1.01		0.72		1.42	
Mode of birth										
Normal vaginal	176.89	27.00	176.67	3.00	171.83	9.00	169.63	13.00	165.31	101.00
Elective CS[1]	175.90	27.50	171.57	4.00	185.21	9.50	171.36	14.00	166.69	101.00
Emergency CS[1]	183.04	27.00	186.58	5.00	138.71	7.50	189.25	16.00	179.15	102.00
Bivariate test (χ^2)	0.04		0.20		1.97		0.46		0.26	
Medical intervention										
Episiotomy										
Yes	116.87	26.00	114.85	3.00	113.27	8.00	111.37	12.00	17547.50	102.00
No	102.70	25.50	110.66	2.00	109.44	8.00	112.00	13.00	5030.50	102.50
Bivariate test (z)	-1.308		-.388		-.059		-.355		-0.95	
Amniotomy										
Yes	102.73	27.00	95.91	3.50	90.85	9.00	92.06	13.00	5547.50	102.00
No	85.20	24.00	88.74	3.00	89.47	8.00	87.14	13.00	9158.50	103.00
Bivariate test	-2.182*		-.900		-.621		-.174		-0.40	
Instrumental delivery										
Yes	134.84	27.00	124.00	4.00	111.75	8.00	111.17	13.00	1842.00	100.00
No	109.32	26.00	110.33	3.00	109.30	8.00	108.80	13.00	19686.00	102.00
Bivariate test (z)	-1.658		-.893		-.153		-.159		-0.31	
EDA2										
Yes	112.36	26.00	109.03	3.00	113.63	9.00	109.40	14.00	7305.00	102.00
No	108.06	26.00	108.99	3.00	103.76	8.00	103.55	12.00	14016.00	102.00
Bivariate test (z)	-.475		-.005		-.658		-1.103		-0.36	
OT[3]- induction										
Yes	129.72	28.00	134.87	6.50	129.61	10.00	118.53	10.00	4103.50	100.00
No	108.36	24.00	107.30	3.00	105.88	8.00	106.98	8.00	18262.50	102.00
Bivariate test (z)	-1.860		-2.414*		-2.108*		-1.031		-0.39	
Early Experiences										
Father present										
Yes	160.90	28.00	175.19	4.00	142.62	9.00	140.08	12.50	3471.00	103.00
No	148.64	26.00	147.55	3.00	145.72	9.00	144.83	13.00	35589.00	101.00
Bivariate test (z)	-.630		-1.425		-.247		-.164		-1.07	
Immediately skin-to-skin contact with mother										
Yes	93.55	27.00	94.26	3.50	90.04	8.00	88.32	13.00	4654.00	102.00
No	89.26	26.00	88.97	3.00	88.57	8.00	88.57	13.00	10397.00	101.00
Bivariate test (z)	-.501		-.621		-.030		-.175		-0.43	
Early breastfeeding										
Yes	82.69	27.00	83.73	3.00	79.05	8.00	81.14	12.00	6093.50	102.00
No	84.31	26.00	83.27	3.00	86.04	8.00	81.88	13.00	6467.50	101.00
Bivariate test (z)	-0.218		-0.062		-0.101		-0.948		-0.37	
Rooming-in with mother										
Yes	113.39	24.00	114.26	4.00	112.99	9.00	118.37	14.50	3823.50	100.00
No	104.00	26.00	103.76	3.00	102.16	8.00	98.39	12.00	15877.50	102.00
Bivariate test (z)	-0.916		-1.029		-1.074		-1.957		-1.07	

Table 20: The association breastfeed during the infancy of the respondents and their scores on W-DEQ A subscales.

Having been Breastfeed during infancy										
No breastfeeding	109.33	28.00	159.83	7.00	145.83	12.00	134.83	12.00	120.06	97.00
Less than 6 months	133.83	26.00	134.14	4.00	137.56	9.00	135.49	9.00	127.52	100.00
6-12 months	132.75	27.00	137.66	5.00	120.97	8.50	121.26	8.50	142.32	103.00
More than 12 months	110.94	26.00	93.54	2.00	120.72	9.00	123.17	9.00	116.25	102.00
Bivariate test (χ^2)	2.500		7.452		3.186		2.293		2.14	

* P<0.05   1. Cesarean Section   2. Epidural Analgesia   3. Oxytocin

Table 21: Relationship between the history of breastfeeding in previous pregnancy and fear of childbirth subscales and maternal-fetal attachment in multiparous women. (N=361)

Variable	Lack of positive emotion		Moment of birth		Fear		Isolation		Maternal-fetal attachment	
	Mean rank	Median	Mean rank	Median	Mean rank	Median	Mean rank	Median	Mean rank	Median
No breastfeeding	110.18	31.00	88.41	5.00	105.18	10.00	106.55	31.50	73.00	99.00
Less than 6 months	83.39	26.00	78.51	3.50	83.77	12.00	84.40	35.00	74.77	99.00
6-12 months	75.93	23.00	71.26	3.00	75.63	12.00	72.52	40.00	69.61	99.00
More than 12 months	71.11	23.00	82.31	4.00	66.08	13.00	64.53	40.00	72.49	100.00
Bivariate test (χ^2)	7.463		2.037		8.908[*]		10.901[*]		0.32	

* P<0.05

Appendix

1- *Socio-demographic and obstetric checklist*

2- *Wijma Delivery Expectancy/Experience Questionnaire (WDEQ- A)*

3- *Beck Anxiety Inventory (BAI)*

4- *Beck Depression Inventory-Short Form (BDI-SF)*

5- *Mother's birth circumstances* scale (MBCS)

6- *Multidimensional Scale of Perceived Social Support (MSPSS)*

7- *Maternal-fetal attachment scale (MFAS)*

8- *PROMIS–43 Profile v2.0*

Szüléssel kapcsolatos érzések vizsgálata
Életminőség és társas támogatás terhesség során
Demográfiai kérdések

1. Melyik évben született? _____

2. Mi az Ön legmagasabb iskolai végzettsége?
   1. Kevesebb, mint középiskola
   2. Középiskola (szakiskola)
   3. Középiskola (szakközépiskola, gimnázium)
   4. Felsőfokú szakképzés
   5. Főiskola
   6. Egyetem
   7. Tudományos fokozat

3. Mi a véleménye háztartása havi jövedelméről, hogyan értékelné azt?
   1. Nem elég a mindennapi megélhetéshez
   2. Nehéz megélni belőle
   3. Elég a mindennapos megélhetésheez
   4. Nincsenek megélhetési gonjaink, jödelemeinkből jól megélünk

4. Mi az Ön foglalkozási formája (kérjük, hogy a terhessége előtti időszakra gondoljon elsősorban)?
   1.Teljes munkaidőben dolgozik
   2.Részmunkaidőben dolgozik
   3.Önfoglalkoztatott, vállalkozó
   4.Háztartásbeli
   5.Diák

   Mi az Ön lakóhelyének típusa?
    1. főváros / megyeszékhely
    2. város
    3. falu, község

5. Mi az Ön családi állapota?
   1. Házas
   2. Élettársi kapcsolatban él
   3. Özvegy (Kérjük, ugorjon a … kérdésre!)
   4. Elvált, külön él (Kérjük, ugorjon a … kérdésre!)
   5. Hajadon (Kérjük, ugorjon a … kérdésre!)

6. Melyik évben született az Ön partnere/férje? _____

7. Mi az Ön partnerének / férjének legmagasabb iskolai végzettsége?
   1. Kevesebb, mint középiskola
   2. Középiskola (szakiskola)
   3. Középiskola (szakközépiskola, gimnázium)

4. Felsőfokú szakképzés
5. Főiskola
6. Egyetem
7. Tudományos fokozat

8. Mi az Ön partnere foglalkozási formája jelenleg?
1. Teljes munkaidőben dolgozik
2. Részmunkaidőben dolgozik
3. Önfoglalkoztatott, vállalkozó
4. Diák
5. Nyugdíjas, egyéb inaktív

9. Az Ön magzatának kora: _____ hét

10. Hányadik terhesség a jelenlegi? _____

11. Volt-e korábban abortusza, vagy vetélése?
    1. Igen   2-nem

12. Jelenlegi terhessége tervezett terhesség?
    1. Igen   2.nem

13. Tapasztalt-e bármilyen egészségügyi problémát, betegséget jelenlegi terhessége során? (mint magas vérnyomás, cukorbetegség, stb.)
    1. igen, mi az_____
    2. nem

14. Milyen típusú volt a legutóbbi szülése?
    1- Normál szülés
    2- Sürgősségi császármetszés
    3- elektív császármetszés
    4- Orvosi indikációk következtében
    5- végrehajtott császármetszés

15. Milyen érzései, tapasztalatai vannak a legutóbbi terhességével kapcsolatban?
    1. pozítv, kellemes tapasztalataim vannak   2- negatív, rossz tapasztalataim vannak

16. Milyen érzései, tapasztalatai vannak a legutóbbi szülésével kapcsolatban?
    1- pozítv, kellemes tapasztalataim vannak   2- negatív, rossz tapasztalataim vannak

17. Mi a kedvenc tipusu szallitas?
    1-Normál szülés   2-császármetszés

18- Szoptatta-e korábban gyermekét?

       1. Nem   2. Igen, mennyi ideig?   kevesebb, mint 6 hónapig

                             6-12 hónap között   több mint 12 hónapig

Kérdőív a szüléshez kapcsolódó várakozások és élmények feltérképezésére
(W-DEQ)
A változat
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ÚTMUTATÓ

Ezen kérdőív célja, hogy feltárja a majdani vajúdáshoz és szüléshez kapcsolódó érzéseket és gondolatokat.

A kérdésekre adott válaszok egy 0-tól 5-ig terjedő skálán találhatók. A skála két végén elhelyezkedő válaszok (0 és 5) egy bizonyos érzés vagy gondolat ellenkező végleteinek felelnek meg.

Kérem, minden kérdésnél karikázza be azt a számot, amelyik a leginkább megfelel annak, ahogyan az Ön előtt álló vajúdást illetve szülést **elképzeli**.

Kérem, válaszai azt tükrözzék, ahogyan **elképzeli** majdani vajúdását és szülését – és ne azt, ahogyan *reméli*, hogy zajlani fog.

I   Mit gondol, hogyan fog alakulni a vajúdás illetve a szülés összességében?

1   0   1   2   3   4   5

Nagyon-nagyon   Egyáltalán nem lesz

fantasztikus lesz.   fantasztikus.

2   0   1   2   3   4   5

Nagyon-nagyon   Egyáltalán nem lesz   szörnyű lesz.
szörnyű.

II   Mit gondol, hogyan fogja érezni magát a vajúdás illetve a szülés alatt általánosságban?

3   0   1   2   3   4   5

Teljesen magányosnak   Egyáltalán nem fogom

fogom magam érezni.   magányosnak érezni magam.

4   0   1   2   3   4   5

Rendkívül erősnek fogom

magam érezni.

Egyáltalán nem fogom

erősnek érezni magam.

5   0   1   2   3   4   5

Teljesen eltölt majd

a magabiztosság érzése.

Egy csepp

magabiztosság

sem lesz bennem.

6   0   1   2   3   4   5

Tele leszek

aggodalommal.

Egy csepp aggodalom

sem lesz bennem.

7   0   1   2   3   4   5

Teljesen kiszolgáltatottnak

fogom magam érezni.

Egyáltalán nem fogom

kiszolgáltatottnak érezni

magam.

II   Mit gondol, hogyan fogja érezni magát a vajúdás illetve a szülés alatt?

8   0   1   2   3   4   5

Teljesen erőtlennek

fogom magam érezni.

Egyáltalán nem fogom

erőtlennek érezni magam.

9   0   1   2   3   4   5

Tökéletes biztonságban

fogom magam érezni.

Egyáltalán nem fogom

biztonságban érezni

magam.

10   <u>0   1   2   3   4   5</u>

Teljesen önállónak fogom   Egyáltalán nem fogom

magam érezni.   önállónak érezni magam.

11   <u>0   1   2   3   4   5</u>

Teljesen reményvesztett   Egyáltalán nem leszek

leszek.   reményvesztett.

12   <u>0   1   2   3   4   5</u>

Rendkívül feszült   Egyáltalán nem leszek

leszek.   feszült.

13   <u>0   1   2   3   4   5</u>

Teljesen derűs   Egyáltalán nem leszek

leszek.   derűs.

14   <u>0   1   2   3   4   5</u>

Rendkívüli büszkeség fog   Egyáltalán nem fog   eltölteni.
büszkeség eltölteni.

15   <u>0   1   2   3   4   5</u>

Teljesen elhagyatottnak   Egyáltalán nem fogom

fogom magam érezni.   elhagyatottnak érezni

                                         magam.

16   <u>0   1   2   3   4   5</u>

Teljesen összeszedett   Egyáltalán nem leszek

leszek.   összeszedett.

17	0	1	2	3	4	5

Teljesen nyugodt
leszek.

Egyáltalán nem
leszek nyugodt.

18	0	1	2	3	4	5

Tökéletes boldogság
fog eltölteni.

Egy cseppet sem
leszek boldog.

III   Mit gondol, mit fog érezni a vajúdás és a szülés alatt?

19	0	1	2	3	4	5

Nagyon erős
rémület lesz rajtam úrrá.

Egy csepp rémületet
sem fogok érezni.

20	0	1	2	3	4	5

Teljes reménytelenség
lesz rajtam úrrá.
.

Egy csepp
reménytelenség
sem lesz bennem.

21	0	1	2	3	4	5

Nagyon erősen vágyódom
majd a babám után.

Egyáltalán nem fogok
vágyódni a babám után.

22	0	1	2	3	4	5

Teljesen eltölt majd az
önbizalmam sem lesz.

Egyáltalán semmi önbizalom.

23	0	1	2	3	4	5

Teljesen eltölt
majd a bizakodás érzése.

Egyáltalán semmi
bizakodás sem lesz bennem.

24   0   1   2   3   4   5

Rettenetesen fogok   Egyáltalán nem

szenvedni.   fogok szenvedni.

IV   Mit gondol, mi fog történni, amikor a legintenzívebben fog vajúdni?

25   0   1   2   3   4   5

Igazán borzasztóan   Egyáltalán nem fogok

fogok viselkedni.   borzasztóan viselkedni.

26   0   1   2   3   4   5

Hagyni fogom, hogy a testem   Egyáltalán nem fogom

teljesen átvegye   hagyni, hogy a testem

az irányítást.   átvegye az irányítást.

27   0   1   2   3   4   5

Minden önuralmamat   Egyáltalán nem

el fogom veszíteni.   fogom elveszíteni az önuralmamat.

V   Hogyan képzeli azt a pillanatot, amikor megszüli a babáját?

28   0   1   2   3   4   5

Tökéletesen örömteli   Egyáltalán nem

lesz.   lesz örömteli.

29   0   1   2   3   4   5

Teljesen természetes   Egyáltalán nem

lesz.   lesz természetes.

30   0   1   2   3   4   5

Teljesen magától   Egyáltalán nem lesz   értetődő lesz.
magától értetődő.

31   0   1   2   3   4   5

Rettentő veszélyes lesz.   Egyáltalán nem lesz

                                                        veszélyes.

VI   Voltak-e az elmúlt hónapban a vajúdással illetve a szüléssel kapcsolatos rémképei, mint például:

32   … hogy a gyermeke meg fog halni a vajúdás vagy a szülés során?

            0   1   2   3   4   5

        Soha.   Nagyon gyakran.

33   ... hogy gyermekének baja fog esni a vajúdás vagy a szülés során?

            0   1   2   3   4   5

        Soha.   Nagyon gyakran.

Most kérem, ellenőrizze, hogy minden kérdésre válaszolt-e!

Az alábbi listán a szorongás általános tünetei találhatók. Kérem, olvassa el gondosan a lista összes tétlét! Jelezze, hogy mennyire zavarták az egyes tünetek az elmúlt héten, beleértve a mai napot is. Helyezzen X-et minden egyes tünethez a megfelelő oszlopba!

		0	1	2	3
		Egyáltalán nem zavart	Enyhén, nem zavart túlságosan	Mérsékelten kellemetlen volt, de kibírtam	Erősen, alig tudtam elviselni
1	Dermedtség, kábultság				
2	Melegségérzet				
3	Lábremegés				
4	Nem tud ellazulni				
5	Félelem attól, hogy a legrosszabb történik				
6	Szédülés				
7	Heves szívverés				
8	Bizonytalanság				
9	Rémület				
10	Idegesség, izgatottság				
11	Fulladásérzés				
12	Kézremegés				
13	Reszketés				
14	Félelem a kontroll elvesztésétől				
15	Légzési nehézség				
16	Halálfélelem				
17	Ijedtség				
18	Emésztési probléma vagy diszkomfortérzés a hasban				
19	Bágyadtság, ájulás				
20	Arcpirulás				
21	Izzadás (nem a meleg miatt)				

Hogyan érezte magát az elmúlt időszakban? Válaszoljon az alábbiak szerint:

0. egyáltalán nem jellemző 1. alig jellemző   2. jellemző   3. teljesen jellemző

1. *Minden érdeklődésemet elvesztettem mások iránt* — 0 1 2 3

2. *Semmiben sem tudok dönteni többé.* — 0 1 2 3

3. *Több órával korábban ébredek, mint szoktam, és nem tudok újra elaludni.* — 0 1 2 3

4. *Túlságosan fáradt vagyok, hogy bármit is csináljak.* — 0 1 2 3

5. *Annyira aggódom testi-fizikai panaszok miatt, hogy másra nem tudok gondolni.* — 0 1 2 3

6. *Semmilyen munkát nem vagyok képes ellátni.* — 0 1 2 3

7. *Úgy látom, hogy a jövőm reménytelen és a helyzetem nem fog változni.* — 0 1 2 3

8. *Mindennel elégedetlen, vagy közömbös vagyok.* — 0 1 2 3

9. *Állandóan hibáztatom magam.* — 0 1 2 3

Születésem Körülményei Kérdőív

Az alábbiakban az ön születésével kapcsolatos kérdéseket talál. Az utóbbi években egyre több kutatás foglalkozik azzal, hogy a születés körülményei és egyéb változók (például személyiségjellemzők) között keressen összefüggéseket.

Kérjük, **tegyen X-et** a megfelelő állítás mellé, ami az ön születésére igaz, és **ha szükséges**, **egészítse ki** a kért adatokkal (amennyiben azokat ismeri)! Sokan nem tudják ilyen részletességgel saját születésük körülményeit, ezért több helyen lehetősége van a „nem tudom" választ adni.

1- <u>Születés ideje:</u>

_____ Időre születtem

_____ Koraszülött voltam .... hónapra születtem

_____ Túlhordtak …. nappal

_____Nem tudom

2- <u>Születés módja:</u>

_____Természetes (hüvelyi) úton születtem

_____ Császármetszéssel születtem

_____Tervezett császármetszés volt

_____Sürgősségi császármetszés volt

_____Nem tudom

<u>Milyen beavatkozás(ok)ra került sor?</u>

Beavatkozás	Sor került rá	Biztosan nem került rá sor	Nem tudom
Gátmetszés			
Burokrepesztés			
Vákuum- vagy fogóhasználat			
Szülészeti fájdalomcsillapítás (EDA, epidurális anesztézia)			
Szülés megindítása(pl. oxitocinnal) vagyis programozott szülés			

Szülés gyorsítása(pl. oxitocinnal)			
Egyéb, éspedig:…………….			

Korai élmények

Esemény, körülmények	Sor került rá	Biztosan nem került rá sor	Nem tudom
Papás szülés volt (édesapám is ott volt a születésemkor)			
Közvetlenül a szülést követően édesanyámmal maradhattam (bőr-bőr kontaktusban)			
Lehetőség volt korai szoptatásra (az első néhány életórában)			
Rooming-in-ben voltam (vagyis együtt voltam édesanyámmal a kórházi napok során)			
Szoptattak	……. hónapos koromig		

Észlelt Társas Támogatás Multidimenziós Skála

Instrukció: A kérdőív ezen részében azt szeretnénk felmérni, milyen érzéseket keltenek Önben az alábbi állítások. Kérjük, figyelmesen olvassa el az alábbi kejelentéseket, majd értékelje őket:

Adjon 1-est, ha **semmilyen körülmények között nem ért egyet**

Adjon 2-est, ha **kifejezetten nem ért egyet**

Adjon 3-ast, ha **valamennyire nem ért egyet**

Adjon 4-est, ha **semleges a kérdés**

Adjon 5-öst, ha **valamennyire egyetért**

Adjon 6-ost, ha **kifejezetten egyetért**

Adjon 7-est, ha **minden körülmények között egyetért**

1.	Van olya ember a környezetemben, akire számíthatok a bajban.	1	2	3	4	5	6	7
2.	Van olyan ember, akivel megoszthatok örömöt és bánatot.	1	2	3	4	5	6	7
3.	A családom minden esetben próbál segíteni nekem.	1	2	3	4	5	6	7
4.	Megkapom a családomtól azt az érzelmi támogatást, amire szükségem van.	1	2	3	4	5	6	7
5.	Van körülöttem olyan ember, aki minden esetben meg tud vígasztalni.	1	2	3	4	5	6	7
6.	A barátaim minden esetben próbálnak segíteni nekem.	1	2	3	4	5	6	7
7.	Számíthatok a barátaimra a bajban.	1	2	3	4	5	6	7
8.	Tudok beszélni a családommal a problémáimról.	1	2	3	4	5	6	7
9.	Vannak olyan barátaim, akikkel megoszthatok örömöt és bánatot.	1	2	3	4	5	6	7
10.	Van olyan ember a környezetemben, akit érdekel, hogy érzek. .	1	2	3	4	5	6	7
11.	A családom segít a döntések meghozatalában.	1	2	3	4	5	6	7
12.	Tudok beszélni a barátaimmal a problémáimról..	1	2	3	4	5	6	7

Kérjük, értékelje az alábbi önmagával és magzatával kapcsolatos állításokat. Nincsenek jó vagy rossz válaszok, általában az első gondolata tükrözi leginkább érzéseit. Kérjük, hogy minden kérdésre válaszoljon, és mondatonként csak egyetlen választ karikázzon be.

Az alábbiakat gondolom, teszem:	Határo-zottan igen	Igen	Bizonytalan	Nem	Határo-zottan nem
1. Beszélek a babámhoz.	5	4	3	2	1
2. Úgy érzem, minden nehézség ellenére megéri várandósnak lenni.	5	4	3	2	1
3. Élvezem figyelni a hullámzó pocakom, amint a baba rugdalózik odabent.	5	4	3	2	1
4. Látom magam, amint etetem a babát.	5	4	3	2	1
5. Már nagyon várom, hogy láthassam, hogy néz ki a baba.	5	4	3	2	1
6. Kíváncsi vagyok, vajon beszorítva érzi-e magát a baba odabent.	5	4	3	2	1
7. Becenéven beszélek a babámról.	5	4	3	2	1
8. Elképzelem magam, amint gondoskodom a babáról.	5	4	3	2	1
9. A babám mozgásából sejtem, hogy milyen lesz a személyisége.	5	4	3	2	1
10. Eldöntöttem, hogy fogják hívni a babát, ha kislány lesz.	5	4	3	2	1
11. Egészségem érdekében olyan dolgokat is megteszek, amelyeket nem tennék, ha nem lennék várandós.	5	4	3	2	1
12. Kíváncsi vagyok, hall-e a baba a pocakomban.	5	4	3	2	1
13. Eldöntöttem, hogy fogják hívni a babát, ha fiú lesz.	5	4	3	2	1
14. Kíváncsi vagyok, hogy a baba gondol és érez-e dolgokat odabent.	5	4	3	2	1
15. Húst és zöldséget is eszem, hogy a babám megfelelő táplálékot kapjon.	5	4	3	2	1
16. Úgy érzem, mintha a babám rugdosással és mozgással jelezné, amikor eljött az evés ideje.	5	4	3	2	1
17. Megbökdösöm a pocakom, hogy a babám visszabökjön.	5	4	3	2	1
18. Alig várom, hogy a babát a karomban tarthassam.	5	4	3	2	1
19. Próbálom elképzelni, hogy fog kinézni a baba.	5	4	3	2	1
20. Simogatom a pocakom, hogy elcsendesítsem a babát, amikor túl sokat rugdos.	5	4	3	2	1
21. Érzem, mikor csuklik a baba.	5	4	3	2	1
22. Csúnyának érzem a testem.	1	2	3	4	5
23. Lemondok dolgokról azért, hogy ezzel jót tegyek a babámnak.	5	4	3	2	1
24. A pocakomon keresztül megfogom a baba lábát, és körbemozgatom.	5	4	3	2	1

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Kérem válaszoljon az alábbi kérdésekre soronként egy kocka megjelölésével.

	Fizikai funkciók	Nehézség nélkül	Kevés nehéz-séggel	Némi nehéz-séggel	Nagy nehéz-séggel	Nem tudom megtenni
1	Képes olyan apró munkákra, mint porszívózás vagy kerti munka?	☐	☐	☐	☐	☐
2	Képes a lépcsőn le-föl menni normal tempóban?	☐	☐	☐	☐	☐
3	Képes legalább 15 perces sétát tenni?	☐	☐	☐	☐	☐
4	Képes háztatást vezetni és bevásárolni?	☐	☐	☐	☐	☐
		Egyáltalán nem tudom megtenni	Nagyon kicsit	Valamennyire	Sokszor	Nem
5	Az egészsége meggátolja abban, hogy két órányi fizikai munkát végezzen?	☐	☐	☐	☐	☐
6	Az egészsége meggátolja abban, hogy kisebb munkákat csináljon otthonában; pl. porszívózás, felmosás, megvásárolt termékek becipelése?	☐	☐	☐	☐	☐

	Szorongás **Az elmúlt hét napban…**	Soha	Nagyon ritkán	Néha	Gyakran	Mindig
7	Félelmet éreztem..	☐	☐	☐	☐	☐
8	Nehezen tudtam a szorongáson kívül másra fókuszálni	☐	☐	☐	☐	☐
9	Az aggodalmam elhatalmasodott rajtam…	☐	☐	☐	☐	☐
10	Kényelmetlenül éreztem magam................	☐	☐	☐	☐	☐
11	Izgultam...	☐	☐	☐	☐	☐
12	Úgy éreztem, szükségem van segítségre, hogy leküzdjem az aggodalmat	☐	☐	☐	☐	☐

	Depresszió **Az elmúlt hét napban…**	Soha	Nagyon ritkán	Néha	Gyakran	Mindig
13	Haszontalannak éreztem magam..................	☐	☐	☐	☐	☐
14	Tehetetlennek éreztem magam...................	☐	☐	☐	☐	☐
15	Depresziósnak éreztem magma	☐	☐	☐	☐	☐

Depresszió

Az elmúlt hét napban…

		Soha	Nagyon ritkán	Néha	Gyakran	Mindig
16	Reménytelennek érztem magam	☐	☐	☐	☐	☐
17	Kudarcnak éreztem magam................	☐	☐	☐	☐	☐
18	Szomorúnak éreztem magam..............	☐	☐	☐	☐	☐

Fáradtság

Az elmúlt hét nap során…

		Soha	Nagyon ritkán	Néha	Gyakran	Mindig
19	Fáradtnak éreztem magam.........................	☐	☐	☐	☐	☐
20	Nehezen tudok elkezdeni dolgokat, mert fáradt vagyok..	☐	☐	☐	☐	☐

Az elmúlt 7 napban

21	Általában mennyire kimerültnek éreztem magát?	☐	☐	☐	☐	☐
22	Általában mennyire volt fáradt?..........	☐	☐	☐	☐	☐
23	Mennyire zavarta önt kimerültsége általában?....................................	☐	☐	☐	☐	☐
24	Fáradtsága mennyire befolyásolta fizikai funkcionálását?................	☐	☐	☐	☐	☐

Alvászavarok

Az elmúlt hét napban…

		Nagyon rossz	Rossz	Közepes	Jó	Nagyon jó
25	Az alvásom minősége..............	☐	☐	☐	☐	☐

Az elmúlt hét napban···

		Egyáltalán nem	Kevéssé	Némileg	Jócskán	Kifejezetten
26	Alvásom frissítő volt............................	☐	☐	☐	☐	☐
27	Problémám volt az alvással..................	☐	☐	☐	☐	☐
28	Nehezen aludtam el....................	☐	☐	☐	☐	☐
29	Zavartalanul aludtam	☐	☐	☐	☐	☐
30	Nehezen jutottam el az alvásig	☐	☐	☐	☐	☐

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A szociális életben való részvétel

		Soha	Nagyon ritkán	Néha	Gyakran	Mindig
31	Nehezen tudom a másokkal történő kikapcsolódást megvalósítani..................	☐	☐	☐	☐	☐
32	Nehezen tudom azokat a családi tevékeny-ségeket megvalósítani, amiket szeretnék	☐	☐	☐	☐	☐
33	Nehezen tudom megvalósítani a munkám (beleértve a házimunkát is)	☐	☐	☐	☐	☐
34	Nehezen tudom azokat a baráti tevékeny-ségeket megvalósítani, amiket szeretnék	☐	☐	☐	☐	☐
35	Limitálnom kell a másokkal történő szabadidős tevékenységeket	☐	☐	☐	☐	☐
36	Limitálnom kell a barátokkal történő tevékenységeket	☐	☐	☐	☐	☐

Fájdalom befolyása

Az elmúlt hét napban…

		Egyáltalán nem	Kevéssé	Némileg	Jócskán	Kifejezetten
37	Mennyire befolyásolta a fájdalom a mindennapi tevékenységeit?	☐	☐	☐	☐	☐
38	Mennyire befolyásolta a fájdalom az otthoni munkában?	☐	☐	☐	☐	☐
39	Mennyire befolyásolta a fájdalom a szociális tevékenységekben való részvételét?	☐	☐	☐	☐	☐
40	Mennyire befolyásolta a fájdalom az otthoni apró munkában?	☐	☐	☐	☐	☐
41	Mennyire befolyásolta a fájdalom a szabadidős tevékenységeit?	☐	☐	☐	☐	☐
42	Mennyire befolyásolta a fájdalom a szociális tevékenységek élvezetét?	☐	☐	☐	☐	☐

Fájdalom erőssége

Az elmúlt hét napban…

43

Hogyan értékelné fájdalmát általában?................

☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
0	1	2	3	4	5	6	7	8	9	10
Semmi fájdalom										A legrosszabb elképzelhető fájdalom

Appendix 7

**SUBMISSION OF THE DOCTORAL DISSETRTATION AND DECLARAITION OF
THE ORIGINALITY OF THE DISSERTATION**

The undersigned

name: MoghaddamHosseini BIBI Vahideh

maiden name:

mother's maiden name: Sabermoghaddam Esmat

place and time of birth: Mashhad, Iran. 12/20/1980

on this day submitted my doctoral dissertation entitled

*"The relationship between health- related quality of life, mother's birth circumstances
and fear of childbirth: A transgenerational approach."*

to the programme/topic area:

Programme Nr. 5   Human Reproduction,

Doctoral School of Health Sciences, Faculty of Health Sciences, University of Pécs

Names of the consultant(s): Dr. Ákos Várnagy, Dr. Katalin Varga

At the same time I declare that
- I have not submitted my doctoral dissertation to any other Doctoral School (neither in this country nor abroad),
- My application for degree earning has not been rejected in the past two years,
- In the past two years I have not had unsuccesful doctoral procedures,
- My doctoral degree has not been withdrawn in the past five years,
- My dissertation is independent work, I have not presented others' intellectual work as mine, the references are definite and full, on preparation of the dissertation I have not used false or falsified data.

Dated: 22/2/2019

…………………………………………
signed by candidate