

**NON-MEDICAL FACTORS IN THE  
BACKGROUND OF CESAREAN SECTIONS IN  
SOUTH-EAST HUNGARY**

**Ph.D. Thesis**

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**Publications related to the thesis**

- I. Dweik D, Szimjanovszki I, Mészáros Gy, Pál A. Cesarean delivery on maternal request: Survey among obstetricians/gynecologists in south-east Hungary. (Császármetszés anyai kérésre – hogyan a délkelet-magyarországi szülész-nőgyógyászok látják.) Orv Hetil. 2013,33: 1303-11.
- II. Dweik D, Girasek E, Töreki A, Mészáros G, Pál A. Women's antenatal preferences for delivery route in a setting with high cesarean section rates and a medically dominated maternity system. Acta Obstet Gynecol Scand. 2014,93:408-15.
- III. Dweik D, Girasek E, Töreki A, Keresztúri A, Mészáros Gy, Pál A. Non-medical determinants of cesarean section in a medically dominated maternity system. Acta Obstet Gynecol Scand. 2014,93:1025-1033.

## 1. Introduction

Hungary has been showing just as high cesarean rates as have evolved in many middle or high resource countries in the 21<sup>st</sup> century: in 2012 34.5% of all deliveries were cesarean sections and there has been a steeply rising tendency for this since the political transition in the late 1980s, when the rate was 10-11%. Domestic and international debates concerning the reasons for this epidemic have highlighted numerous contributors to this trend: less risky procedures due to medical development; remarkable demographic changes in the pregnant population; widening of the range of indications for CS; threatening medico-legal environment. Beside these factors, the possible role of openly expressed and irrefutable demands of pregnant women has also emerged.

Cesarean delivery on maternal request (CDMR) is CS performed electively on maternal request in term following a physiological singleton pregnancy in the absence of any reasonable medical indication. The concept of large quantities of CDMRs in the background of skyrocketing CS rates of many 'Western' countries launched a new generation of studies that investigated the attitudes, beliefs, preferences, needs and fears of expectant mothers. Many of these studies, however, instead of affirming the assumption that large numbers of women are in favor of CS, called the attention to other issues possibly contributing to rising CS rates such as fear of childbirth (FOC), inadequacy of the information giving process, convenience and financial incentives of physicians, and anomalies of different maternity care systems, including women's limited access to midwifery care or their fears of receiving substandard maternity care. The widespread notion of obstetricians' respect for patient autonomy was also challenged by some studies.

Fear of childbirth has been an emerging field of research into birth preferences, birth outcome and rising CS rates. It has most thoroughly been investigated in the Nordic states, where maternity care is known to be putting a greater emphasis on the attitudes, beliefs, fears and concerns of peripartum women. The definition of FOC is anxiety disorder or phobic fear manifesting in nightmares, physical complaints, and difficulties in concentrating on work or on family activities. It can emerge during pregnancy, delivery and labor or in the postpartum period. Moreover, there is a correlation between ante- and postnatal fear: pregnant women suffering from FOC have higher risk to experience labor and delivery in a negative way, which is often irrespective of mode of delivery. Therefore, these conditions compose a higher risk for post partum stress disorder or post partum depression. Antenatal FOC is often, but not necessarily, characterized by a request for CS as mode of delivery. FOC has been shown to be

responsible for more painful and prolonged labor and higher risk for emergency CS; however, there are studies that have not confirmed the association between FOC and birth complications. These conflicting findings and the unlike average FOC levels measured in different populations suggest that the concept of FOC needs to be interpreted within the specific cultural context.

Officially, pregnant women in Hungary do not have the right to choose elective or intrapartum CS as mode of delivery in the absence of firm medical indications. Nevertheless, the topic of CSs performed for non-medical reasons has been a revolving issue of domestic debates. However, the contribution of maternal choice to the rising Hungarian CS rate has never been assessed. It is also of interest to investigate how FOC may manifest itself in a maternity system where midwifery plays a secondary role and CS rates are higher.

The objectives of the first questionnaire survey were to assess the personal opinion of south-east Hungarian obstetricians and gynecologists on CDMR and to reveal their attitudes toward cesarean section vs. vaginal delivery (VD). Due to the continuous care they might provide, they have the possibility to learn about women's beliefs regarding delivery; furthermore, obstetricians' beliefs of the optimal way of giving birth have remarkable impact on patients' views. The aims of the second study were to assess the prevalence of non high-risk pregnant women who, given the chance, would have preferred CS as mode of delivery or were ambivalent in their preference, and to find the difference between these women and those whose preference for vaginal delivery was consistent throughout pregnancy, according to their demographic characteristics, specific attitudes toward birth issues and level of FOC. We also wanted to find the most important factors, apart from medical indications, that determined the actual mode of delivery of women in one of the Hungarian tertiary referral obstetric units, including pregnant women's socio-demographic characteristics, their mid-pregnancy level of FOC, attitudes and preference for mode of childbirth. Our further aim was to enlighten the possible role of organizational issues (staff, timing) related to the subsequent obstetric outcome.

## **2. Materials and methods**

### **2.1. Survey of obstetricians' views on CDMR**

In March 2010 structured, anonymous questionnaires were passed to each of the 137 obstetricians and gynecologists working in the 12 obstetric departments in the South East Hungarian Region by post. The questionnaires were completed by 102 physicians (74.5%). The questionnaire consisted of questions regarding the following topics: the ideal CS rate in Hungary; the rate of CDMRs of all CSs in Hungary; the rate of nulliparous women with physiological singleton pregnancies at term in favor of CS and their motivations for this. According to the secondary aim of the survey, the questionnaire also consisted of questions with regard to obstetricians' opinion about whether it was important to have an official indication for CDMR in Hungary; would they be ready to perform it and/or suggest this option to their patients, in case it was legal. Finally, a list of statements regarding childbirth issues was given: respondents had to select statements that were concordant with their own strong beliefs. Data were analyzed by SPSS for Windows 15.0: chi-square test or Fisher's exact test, and independent samples t-test or Mann–Whitney U-test was used in data analysis.

### **2.2. Survey of pregnant women's childbirth preference and delivery outcome**

**2.2.1. Design.** The prospective follow-up study of pregnant women was a part of a broader observational longitudinal questionnaire survey investigating women's beliefs and attitudes from the 2<sup>nd</sup> trimester of pregnancy to the end of postpartum period with special regard to their birth preferences and level of FOC. Recruitment of participants took place between November 2011 and March 2012 at the time of routine ultrasound examination in the Department of Obstetrics and Gynecology, University of Szeged, Hungary between 18<sup>th</sup> and 22<sup>nd</sup> gestational weeks ( $n = 516$ ). Exclusion criteria were age under 18 years/legal incapacity, illiteracy, not speaking and/or writing Hungarian, high-risk pregnancy (including multiple gestations) or being aware of any true condition that excluded the possibility of subsequent VD. After gaining information on the survey, 503 women gave written consent to participate in the study, and were asked to fill in the first questionnaires (T1). A total of 488 (94.6%) questionnaires were found suitable for statistical analysis.

A second questionnaire was completed between 35-37 weeks at the time of a routine cardiotocography examination (T2). At this second time point 427 questionnaires were gained, and a further 14 paired questionnaires were excluded from the first analysis due to anticipated elective CS because of medical indications learned since T1. Information from 80% of all invited and 82.1% of all consenting women, who completed both questionnaires ( $n$

= 413), were used in the first analysis. Obstetric background information was obtained from the case records. In the second analysis, we used questionnaires completed at T1. Furthermore, information on obstetric outcome of those delivering in the department ( $n = 446$ ) was gained from patient files and through personal communication; of those who delivered elsewhere, seven women responded our query regarding factual data of their delivery. Beside mode of delivery the following complementary obstetric outcome data were obtained: gestational age at delivery; time of day and day of week of delivery; professional level and gender of the participating obstetrician; if he/she was the patient's private obstetrician. Altogether 453 women's questionnaires at T1 and obstetric outcome data were analyzed (87.8% of those consenting).

**2.2.2. Questionnaires.** The antenatal questionnaires consisted of three main parts (A,B,C). Questionnaire A was about birth preference and attitudes toward childbirth-issues. The first topic was addressed by the question: *'Which way would you prefer to deliver your baby, if the decision was up to you?'* The two options given were VD and CS. The attitudes toward pregnancy and childbirth-issues were addressed by 33 statements each followed by a six-point Likert scale (ranging from 0 = *I do not agree at all*, to 5 = *I absolutely agree*). The items were intended to be representing eight distinct dimensions of possible maternal attitudes toward childbirth issues. Questionnaire B was the Hungarian translation of Wijma Delivery Expectancy/Experience Questionnaire A (W-DEQ A, Wijma et al., 1998), a 33-item questionnaire that measures antenatal FOC. It has neither been used nor validated in Hungary before the present study, therefore we used crude W-DEQ A scores in the analysis. In questionnaire C basic socio-demographic data of respondents were obtained in the second trimester and supplementary data in the third trimester.

**2.2.3. Analysis of data.** Statistical analysis of data was performed by using IBM SPSS Statistics Version 20.0.

**2.2.3.1. Analysis of antepartum data.** In the first analysis we averaged paired variables of questionnaires A and B completed at T1 and T2 in order to create variables that better represented the respondents' attitudes and level of FOC throughout pregnancy. Cronbach's alpha of the averaged attitude variables was acceptable at 0.735. The averaged attitude variables were grouped according to our initial hypothesis regarding distinct dimensions of attitudes. These dimensions were then confirmed by principal component analysis. This final eight principal components were: 'Being in control'; 'Right to autonomy';

‘In close contact with the newborn’; ‘Trust in the natural way’; ‘Environmental influence’; ‘CS is more beneficial than VD’; ‘Expectations toward maternity care’; ‘VD, the object of fear’. From variables regarding preference for birth one combined dichotomous variable was created: respondents either determined in their preference for CS or showing uncertainty composed one group (Group 1) versus those consistent in their preference for VD (Group 2). The mean W-DEQ A scores of the two groups were compared by ANOVA (Analysis of Variance) method. Birth preference was explained by binary logistic regression models built up by forward conditional variable selection method. The logistic regression method selects independent variables into the model if the particular predefined variable increases the goodness-of-fit of the model. The logistic regression method selected among the following independent variables: principal component variables created from averaged attitude variables, averaged W-DEQ A scores, and main demographic data. Three models were built: the first model was based on data from all 413 respondents, while the other two models represented nulliparous ( $n = 215$ ) and parous ( $n = 198$ ) women.

**2.2.3.2. Analysis of peripartum data.** In the second analysis eight principal components were extracted from 32 of the 33 attitude variables with almost the same content as in the first analysis. From the variable regarding preference for birth a dichotomous variable was created: respondents either not answering the question or expressing ambiguity and those with explicit preference for CS composed one group versus women preferring VD. Mode of delivery was explained by binary logistic regression models built up by forward conditional variable selection method. Models were composed of the following independent variables: mid-pregnancy childbirth preference, principal components created from attitude variables, W-DEQ A score, main socio-demographic and obstetric history data, supplementary outcome data (timing, staff) of delivery.

Both surveys were approved by the Human Investigation Review Board, University of Szeged, Albert Szent-Györgyi Clinical Centre.

### 3. Results

#### 3.1. Obstetricians' views on CDMR

The ideal CS rate in Hungary would have been 26.5% (SD = 8.76), according to south-east Hungarian obstetricians. The mean rate of CDMR of all CSs performed in Hungary was estimated to be 10.15% (SD = 10.81). The estimated percentage of nulliparous women in favor of CDMR was 26.8% (SD = 20.16%). According to obstetricians, the most important

maternal motivations in the background of a request for CDMR were fear of painful and long lasting labor and worry about the well-being of the newborn. Maternal need for making the most of patient autonomy was also found to be an important motivation. On the other hand, the least important maternal motivations, according to caregivers, were mistrust in health care personnel, previous negative experience regarding health care and pressure on behalf of the private obstetrician.

More than half of obstetricians (55.9%) rejected the possibility of an explicit indication for performing CDMR in Hungary. On the other hand, almost one-third of them (30.4%) expressed a need for free maternal choice with regard to mode of delivery. Respondents from departments providing tertiary care were more likely to accept the notion of CDMR, compared to those working in urban hospitals ( $p = 0.001$ ). If there was an existing indication for CDMR in Hungary, eight out of 10 respondents would have felt ready to perform it; furthermore, 12 of them (11.8% of all respondents) would have even offered the choice of this form of delivery to their patients. Obstetricians from tertiary obstetric units were more likely to show willingness to perform CDMR ( $p = 0.012$ ). Choosing according to their deepest convictions, statements picked by more than half of respondents were without exception in favor of vaginal delivery. The least 'popular' statement was about the lack of time needed to achieve an informed consent in case of CDMR. Significantly larger proportion of respondents expressing explicit willingness to perform CDMR agreed the statements regarding the role of epidemiological changes, lawsuits threatening physicians, easier timing, preserving pelvic floor integrity and the beneficial effect of elective CS on the fetus, compared with the group theoretically rejecting to perform CDMR.

### **3.2. Pregnant women's childbirth preference and delivery outcome**

The majority of women were married or cohabiting, and were expecting to be escorted by partner, relative or friend during labor. Most were urban residents and at least high school graduates. Almost one-fourth of parous women had previous CS. The overwhelming majority conceived spontaneously; only nine respondents had gone through insemination or in vitro fertilization. Around two-thirds of women were planning to be seen by 'private' obstetrician, whereas only a minority was planning to be seen by 'private' midwife.

**3.2.1. Factors in the background of childbirth preference.** In the first analysis the distribution of combined childbirth preferences was the following: 365 (88.4%) respondents were consistent in preferring VD, while all the others expressed preference for CS or ambiguity at least one of the two time-points of the survey. More than half of respondents from the latter group (Group 1) were parous who underwent previous CS (26/48). More than



half of women with previous CS (26/47), but less than 10% of nulliparous women were in Group 1. The averaged W-DEQ A scores were significantly higher in Group 1 compared with Group 2 ( $p = 0.043$ ).

Three variables contributed independently to the first logistic regression model aimed to explain preference for CS and/or uncertain preference (Nagelkerke R-squared = 0.619). Positive impact of principal component 'CS is more beneficial than VD' and variable 'previous CS' was detected, while principal component 'Trust in the natural way' contributed negatively to the multivariate model. The model of nulliparous respondents showed slightly lower goodness-of-fit (0.599). Three variables had a significant impact on childbirth preference: principal component 'CS is more beneficial than VD' showed considerably strong positive impact, and principal component 'Environmental influence' also contributed positively, while principal component 'Being in control' contributed negatively to the model describing preference for CS and/or uncertain preference. The highest goodness-of-fit value (0.716) was in the model for parous women: each variable in the model (principal components 'CS is more beneficial than VD' and 'Expectations toward maternity care' and previous CS) had strong positive contribution to preference for CS and/or uncertain preference, with the strongest impact of previous CS.

**3.2.2. Non-medical factors in the background of mode of delivery.** In the second analysis nine out of 10 respondents ( $n = 410$ , 90.5%) would have chosen VD given the choice, and 7.7% expressed explicit preference for CS in mid-pregnancy. Nulliparous women had higher W-DEQ A scores than their parous counterparts (54.9 vs. 46.2,  $p < 0.001$ ). Finally, two-thirds of respondents ( $n = 301$ , 33.3%) had VD. Significantly more nulliparous ( $n = 95$ ; 40.1%) than parous ( $n = 56$ ; 25.9%) women had CS ( $p = 0.001$ ). Vaginal birth after cesarean (VBAC) rate was 10/51 (albeit two of these women had already gone through VBAC). Significant correlation between delivery outcome and childbirth preference ( $p < 0.001$ ) and between delivery outcome and W-DEQ A score ( $p = 0.005$ ) was detected only among parous women.

Most deliveries took place during working hours, and there were almost twice as many deliveries on Friday than on Saturday, with an increasing trend of deliveries towards the last weekday in case of parous women. Only one-third of deliveries were attended by the obstetrician on duty. In more than three-fifths of the cases the presenting obstetrician had the

power to decide upon CS, and was a male. Almost 60% of the deliveries were attended by obstetricians in their 30s.

Two binary logistic regression models were built up to explain delivery outcome by childbirth preference, W-DEQ A score, socio-demographic characteristics of women, principal components derived from attitude variables and supplementary obstetric outcome data. Three variables contributed independently to the binary logistic regression model of nulliparous respondents aimed to explain delivery by CS. A negative contribution of the principal component 'Being in control' and a positive impact of a longer decision-to-conception interval and the attending obstetrician's power to decide upon CS was detected. In the third step the goodness-of-fit was 0.11. The model for parous respondents showed much higher goodness-of-fit (0.43). The variables that had a significant positive impact were principal components 'CS is more beneficial than VD' and 'Environmental influence' and the age of the attending obstetrician, while age of the respondent contributed negatively to the model describing delivery by CS.

## **4. Discussion**

### **4.1. Ambivalent attitudes of south-east Hungarian obstetricians**

The ideal Hungarian CS rate would only slightly be lower than what actually was in 2010 (33.03%), the year of the survey, according to south-east Hungarian obstetricians, but it would be still two times higher than what was appointed by the World Health Organization consensus conference in 1985. It stated that no additional reduction in perinatal (both maternal and neonatal) morbidity and mortality could be warranted by CS rates exceeding 10-15%. Tolerant attitude of obstetricians toward the proportion of CSs is apparent and certainly has an impact on the societal acceptance of the phenomenon.

More than half of the respondents turned the option of a legalized CDMR down; however, almost one-third of them would have supported such an option, indicating that south-east Hungarian obstetricians' opinion is not equivocal in this question. The more liberal attitude of physicians from tertiary institutions can be explained by the fact that they work in an environment where CSs are more common, basically due to higher rates of women with non-physiologic pregnancies, thus their sensitivity to higher CS rates is not so explicit, compared with that of their counterparts working in urban hospitals. Another possibility is that in a large town setting they may be receiving significantly more maternal requests, which inevitably makes them come up with possible solutions. However, this assumption needs to

be confirmed by further investigation that compares birth preferences of women planning to deliver in different levels of hospitals.

Beside fear of long-lasting and painful labor and worry about the well-being of the child, making the best of patient autonomy was one of the most important maternal motivations, according to respondents. On the other hand, the majority of them excluded the possible role of health care personnel – direct or indirect this role may be. The fundamental contribution of patient pressure to rising CS rates is questioned by many studies. Weaver et al. noted that although all women interviewed in their study, having considered, or having been asked to consider CS during pregnancy ‘expressed an overriding concern for the baby to be born safe and well’, not even one talked about a ‘right to choose caesarean section’. The term CDMR implicitly suggests that if a woman wants to deliver this way so eagerly, she can – but with this decision she has to bear all the responsibility for the complications that might occur. This hypothetical interpretation was also confirmed by the EUROBS study group, who found a significant trend ‘between obstetricians’ self-reported feeling that their clinical practice was influenced, occasionally or often, by fear of litigation and the willingness to perform a caesarean delivery at the patient’s request’. In the Netherlands, it was found that the main reason for obstetricians who were willing to perform CDMR was respect for patient autonomy. The results of our survey, however, unveiled that respect for patient autonomy was far not the most important motivation for our respondents; therefore, it is possible that south-east Hungarian obstetricians would not plead patient pressure, a frequently alluded determinant of rising CS rates in other parts of the world.

Many authors raise the question whether pregnant women’s decisions could be found in the background of CDMRs, or rather, physician’s paternalism, convenience, financial interests or interventionist attitudes. It was found in Brazil that despite the lack of significant difference in pregnant women’s preferences toward mode of delivery, women receiving private care had twice as high risk as those in public care to end up delivering by CS. Another Brazilian study, besides emphasizing the role of financial incentives, highlighted the boom of medical schools at the expense of decline of midwifery schools as an important contributor to the trend of rising CS rates. South-east Brazilian skyrocketing CS rates were partly attributed to the close relationship between doctors and privately insured patients, since only electively scheduled CS could ensure that the patient’s own physician would attend the delivery. Even a study from England detected an association between elective CS and patient affluence suggesting that the role of financial incentives is not negligible. One study about ethics in prenatal diagnostics expressed concern about the interventionist views of people who are most

involved in counseling. On the other hand, Green and Baston showed that patients' attitudes have also shifted towards greater willingness to accept obstetric interventions since the late 1980s. Declerque et al. argued that the lack of (true) documentation was not necessarily equal to explicit maternal request. However, it is possible that true medical indications supporting an intervention are lacking, still, firm diagnoses are listed in the patient file; this practice was called 'socially permitted justification' by Gomes et al.

The contradiction between the theoretical willingness of the majority of obstetricians in this study to perform CDMR and the dismissive opinion of more than half of them on the legalization of it in Hungary, along with their insistence on their professional superiority to be acknowledged by their patients is thought-provoking, though. The resistance of more than half of physicians to an explicit indication for CDMR might have been explained by the traditionally paternalistic doctor-patient relationship that still dominates the obstetric profession. It may also have reflected the official position of the Hungarian College of Obstetrics and Gynecology on CDMR, issued in 2003; however, their practice did not necessarily follow theory. These findings highlighted a segment of the complex reality of 21<sup>st</sup> century obstetrics, including obstetricians' challenge to make their professional standards and experience consistent with circumstances of financing, and the expectations of their patients and the society.

#### **4.2. Determinants of childbirth preference and mode of delivery**

The survey of pregnant women aimed to unfold determinants of maternal childbirth preference and non-medical factors contributing to different modes of delivery in one of the five university obstetric departments in Hungary. We followed-up 411 pregnant women throughout pregnancy in order to unveil important factors in the background of preference for CS or uncertain childbirth preference. We also analyzed 453 non high-risk pregnant women's socio-demographic features, childbirth-related attitudes, fears and preferences and the circumstances among which subsequent deliveries took place and their association with delivery outcome.

This survey of pregnant women is a contribution to the ever growing body of evidence, that, given the chance, only small numbers of pregnant women would choose primary operative delivery in the absence of medical indications, since nine out of 10 respondents expressed (consistent) preference for VD as mode of delivery. This survey, for the first time in Hungary, demonstrated that there were no extremely high numbers of

pregnant women with preference for CS, since around 90% of both samples preferred VD as mode of delivery.

**4.2.1. Factors in the background of childbirth preference.** In the first analysis of pregnant women bivariate analysis revealed an association between mean W-DEQ A scores and preference for CS or ambivalent birth preference; however, neither principal component 'VD, the object of fear', nor W-DEQ A scores contributed to any of our regression models. This means that level of FOC was not an important contributor to childbirth preference in our sample.

Logistic regression analysis did not reveal any differences between participants' main demographic characteristics according to their childbirth preference, apart from previous CS. More than half of maternal preference for CS or uncertainty regarding preferred mode of delivery (represented by Group 1) could be ascribed to women having undergone previous CS. The role of previous CS in the alteration of maternal preference for birth has been highlighted by several studies from different countries. Experience of CS performed for prolonged first stage of labor might convince a woman that she is not able to deliver her baby, whereas, the diagnosis of fetal compromise can label VD as 'dangerous'. According to our results, these cognitive interpretations of perinatal events, along with mistrust in the power of nature, strongly determine the birth preference of not just many parous women with previous CS, but also that of a small but not negligible portion of nulliparous women. The difference is that while these strong beliefs of women with previous CS are based on their own previous delivery experience (principal component 'Expectations toward maternity care'), their nulliparous counterparts primarily reline on information gained from relatives, friends, acquaintances or even obstetric professionals (principal component 'Environmental influence'). Munro et al. called the attention to the impact of persuasive social influences on nulliparous women: in spite of the small numbers of women preferring CS, the influence of emotive birth stories (positively tinged CSs and negatively set VDs) on women who miss their own experience is not negligible. Our results, along with those of many authors', call the attention to the appropriate and sufficient amount of information given to pregnant and postpartum women. Chen and Hancock emphasized that not being aware of the recent scientific evidence of drawbacks and benefits of either trial of labor or repeat cesarean prevented these women with previous CS from rethinking their preference.

We found two principal attitude components which contributed in a negative way to the multiple regression models: the principal component ‘being in control’ for the nulliparous respondents and the principal component ‘trust in the natural way’ for the total sample. Nulliparous women consistent in their preference for VD were more likely to be insisting on their own sense of control. Both nulliparous and parous respondents consistent in their preference for VD were more likely to be convinced that birth is not necessarily about medical technology. Nevertheless, Hungarian CS rates seem to be high enough to gradually erode women’s basic belief in the power of nature and to make them develop a certain tolerance toward CS, by depicting it as ‘safe and simple’.

**4.2.2. Non-medical factors in the background of mode of delivery.** In the second analysis nulliparous women tended to have higher W-DEQ A scores than their parous counterparts, which is equivocal with the international findings. However, neither their W-DEQ A score, nor their preference for delivery predicted delivery outcome. Although bivariate analysis revealed a correlation between both preference for childbirth and W-DEQ A score and delivery outcome in case of parous women, neither of these factors entered the logistic regression models, suggesting that women’s fears or childbirth preference were not independent predictors of the actual delivery outcome. There has been an ongoing debate on whether high level of antenatal FOC or antenatal preference for CS can be related to obstetric complications such as emergency CS or ventouse/forceps delivery. Summarizing the literature, many authors suggest that in countries where activity of midwifery and obstetrics bring about a relative equilibrium, the needs and fears of women can materialize in their pure reality. On the other hand, in maternity care models where power inequality among professionals is obvious and private obstetric care complicates the scene, the effect of women’s attitudes may be played down by other factors. They also conclude that differently conceptualized childbirth and its effect on maternity care policies might be found in the background of different CS rates of countries, rather than individual maternal factors such as FOC.

Although higher W-DEQ A scores and mid-pregnancy maternal childbirth preference did not contribute to the logistic regression models explaining obstetric outcome in our second analysis of pregnant women, some maternal attitudes did enter the models. While principal component ‘Environmental influence’ referred to an extrinsic pressure on parous women not to be involved in VD, principal component ‘CS is more beneficial than VD’ certified an intrinsic belief that CS was the more advantageous and less dangerous of the two options. On

the other hand, higher score reached by nulliparous women at principal component 'Being in control' seemed to be 'protective' against CS. The complementary phenomenon was described by Haines et al.: Australian and Swedish women in the 'Take it as it comes' group were not afraid of delivery, but had no firm preference for birth, therefore were more likely to accept obstetric interventions when those were phrased around the well-being of the child.

In our survey, one of the most important objective predictors of subsequent delivery by CS detected in mid-pregnancy was decision-to-conception interval longer than six months in case of nulliparous respondents. Growing decision-to-conception interval can enhance the 'precious baby' concept of both women and obstetricians. Walker et al., who investigated thresholds of patients and their caregivers toward fetal risk, found that both groups of respondents had low tolerance for fetal risk associated with VD. Women in medicalized model of care were less tolerant compared to those involved in lower intervention model; as the authors put it 'these women may have lowered their expectations for vaginal birth'. The phenomenon of over-estimation of risks in pregnancy seems to drive both women and obstetricians to engage in even more risky procedures.

The possible role of convenience and financial incentives of obstetricians emerged especially in countries with high CS rates. Potter et al. found that the huge difference between CS rates of private and public obstetric patients in Brazil could not be explained by the difference in their preference of delivery, since it was not significant. Abenheim et al. found that Canadian on-call obstetricians compared to the patients' own doctors were more likely to rush to the operating theatre in case of suspected fetal compromise. The explanation for the finding given by the authors was the protective role of the good doctor-patient relationship against malpractice lawsuits. Gyarmati et al. found that CSs were more frequent on workdays and before major holidays, in June and December, but the other, personal factor did not contribute to the rising CS rates. All above mentioned phenomena are good examples of non-medical factors influencing medical willingness to intervene. In contrast with these findings, neither private practice, nor timing contributed significantly to the model describing mode of subsequent delivery in our multivariate analysis. Two factors related to the attending obstetricians, however, played an important role, namely their power to decide upon CS in case of nulliparous and their age in case of parous women. It is not likely that Hungarian obstetricians are not susceptible of the patients' preferences, given the continuous personal care provided throughout pregnancy in the majority of the cases. Although having the power to decide upon CS can provide better time management for a professional, it also means that

he/she bears all responsibility in an obstetric situation to deliver the 'perfect outcome', which might lead to defensive acts. Older age and more experience of the attending obstetrician can also lead to certain cautiousness in doubtful cases.

The majority of women in this study consistently preferred VD antenatally; however, one-third of them delivered by CS. 'The number of women preferring or requesting a CS is far fewer than the number of women receiving the procedure', referred Gamble et al. to the conclusion of their previous review of the literature of CS on maternal request, doubting that the available research establishes women's requests' true role in high CS rates. Potter et al. highlighted that liberal attitude toward CS 'could reduce rather than increase the chances women have to achieve their preferred type of delivery'.

Since around one-third of respondents delivered by CS, which is the same CS rate as the national one, the authors assume that these results are generalizable to the entire pregnant population in the country. The relative weakness of the logistic regression model explaining delivery outcome of nulliparous women suggested that other factors not investigated in this study (most likely medical ones) have a comparably larger contribution to the subsequent delivery outcome in their case. On the other hand, the relative strength of the model for parous women highlighted that in their case medical factors can easily become overshadowed by other aspects.

## **5. Conclusions**

Most south-east Hungarian obstetricians agreed that there was no need in Hungary for a legalized indication that would allow obstetricians to perform CS without firm medical reasons, but almost one-third of them would have welcomed such an option. However, the majority of the respondents felt ready to perform such an operation in case it was a legal option. Respect for patient autonomy was not a central issue for most of the respondents; therefore, we suspect other factors in the background of the finding that more than three-quarters of them would be ready to perform CDMR in case it was legalized.

The majority of respondents in the survey of pregnant women consistently preferred to give birth vaginally. Higher level of fear of childbirth was not identified among the important predisposing factors of an ambivalent or dismissive attitude toward vaginal delivery by multivariate analysis. Certain attitudes, however, did differentiate between pregnant women with distinct preferences for childbirth. Previous CS was also found to be an important contributor to preference for CS or uncertain preference, which was equivocal to the findings



of several studies in this field. Although we detected small numbers of women with explicit and consistent preference for CS throughout pregnancy, the possible normalizing effect of high Hungarian CS rate on nulliparous women's cognitive appraisal regarding childbirth issues needs to be considered.

Although nine out of 10 non high-risk pregnant women preferred VD to CS in mid-pregnancy, one-third of the women ended up having CS. Multivariate analysis did not prove women's mid-pregnancy W-DEQ A scores or preferences to be contributing to delivery outcome; instead, younger maternal age and longer decision-to-conception interval turned out to be important determinants of CS. Among supplementary delivery outcome data timing of delivery did not, while factors related to the attending obstetrician, did contribute to mode of delivery. These findings further contribute to the already existing evidence that in countries with high CS rates the role of non-medical factors, more positively related to obstetricians than to pregnant women's preferences or fears, needs to be emphasized. A shift from the present Hungarian maternity care model toward a balance between medical and midwifery approach could provide women with the entire spectrum of information on maternity issues, which would improve patient autonomy and possibly lower the domestic CS rate.