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Doctoral (PhD) thesis booklet

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**Reproductive Health and Infertility Problems
in Psychosocial Context**

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Introduction

My thesis aims at presenting the systematic description of reproductive health and infertility problems in the context of reproductive health psychology. The approach I take is psychosocial and cultural as opposed to the biomedical viewpoint. The relevance of my thesis is supported by the fact that according to demographic data of 2010 Hungary is one of the countries in Europe with the lowest infertility rate (Kapitány and Spéder, 2012) while 10-15% of the population in the world who are in the fertile age is affected by involuntary childlessness (WHO, 1975, 2009).

Firstly, I approached the issue of infertility in a wider perspective, analyzing cognitions, attitudes and behavioral patterns (Csabai and Molnár, 2009) and I examined the representations of infertility, the beliefs about infertility, the significance of emotional attitudes regarding motherhood and willingness to childbearing. I emphasized the role of health behaviour in the field of reproduction and I introduced the term of fertility consciousness that includes, in addition to biological informations, the knowledge about risk factors, the detecting misconceptions about infertility and the realization of the true role of health behaviour in the field of reproductive health (Bunting and Boivin, 2008).

Secondly, I examined the psychosocial characteristics of infertility problems in the context of infertility treatments (Covington and Burns, 2006). While I described assisted reproduction (ART) with its historical background, procedures, statistics and legal aspects, the psychological dilemmas regarding ART also emerged. Instead of the biomedical definition of infertility I used a new psychosocial term (Pápay 2012). The theoretical framework was provided by the psychological consequence hypothesis of infertility which says that the fertility problems are accompanied by several negative psychological effects and social consequences (Greil, 1997). Based on the principle of circular causation, the long duration of these negative psychological effects can exacerbate infertility both physically and psychologically (Wischmann et al, 2003). Previous studies confirmed that the chronic and intense distress can lower the chances of reproductive success or worsen the quality of life through psychobiological processes (Covington and Burns, 2006, Pápay, 2012). I considered as vital to identify the protective factors that can influence the progress of the infertility-related distress in a positive way. As I worked in the theoretical framework of the coping model, my study correlates with the questions and results of infertility coping literature (Terry and Hynes, 1998; Schmidt et al, 2005). The model says that the distress level experienced during

an infertility treatment is mediated through the coping strategies used by the individual to reduce stress.

My questions regarding fertility and infertility were set out in two empirical studies.

1. The reproductive health study

Aim

The first study approached the issue of fertility from a wider, explorative perspective and examined the reproductive health behaviour of female university students and their attitudes toward fertility, motherhood and infertility. The study has a preventive intent and tried to identify the behavioural problems and lack of information that could be risk factors in reproductive health.

I raised three important questions. (1) Firstly, I sought to answer the question which psychosocial variables influence the attitudes toward childbearing of fertile women. (2) Secondly, which preconceptions they have regarding a possible infertility problem in the future. In the latter case I tried to identify the psychosocial variables hiding behind their choices (assisted reproduction, adoption or the acceptance of a childless lifestyle). (3) Finally I wanted to know which psychosocial variables are in the background of higher level infertility consciousness.

Method

The cross-sectional research titled “ For the reproductive health of women” (Pápay and Rigó, 2010) was conducted as an online survey. The survey package was handed out to the female students of ELTE-PPK (Eötvös Loránd University, Faculty of Education and Psychology) with an active student status in the spring semester 2010. In total 561 surveys came back fully completed, providing the final sample.

The indicators and questionnaires used in the survey can be divided into ten thematic units: (1) general health and gynecological data (2) health behaviour variables and control over health (3) attitudes toward childbearing (4) representations of fecundity (5) views on infertility (6) representations of motherhood (7) sources of information regarding reproduction (8) alternative life objectives (9) Life-Orientation Test-Revised (LOT-R, Scheier, 1994), (10) Big Five Inventory (BFI, John, 2008). On the survey data I conducted multiple linear regressive analysis using the psychosocial variables. Dependent variables: (1) the variation in attitudes toward childbearing (2) choice of fertility alternatives (assisted

reproduction, adoption or the acceptance of a childless lifestyle) as well as (3) level of fertility consciousness.

Results

Regarding these three issues, we can summarize the most important results of the multiple linear regressive analysis as follows.

1. Attitudes toward childbearing

The probability of the willingness to childbearing was predicted in a positive way by a representation which defines motherhood as an integral part of the female identity (Beta=0.41; $p<0.001$). By contrast, experiencing motherhood as a burden lowered the probability of the intention (Beta=-0.17; $p<0.001$). The fear of being infertile increased the willingness to childbearing (Beta=0.12; $p=0.002$). Among individual variables, *agreeableness* (Beta=0.09; $p=0.036$) and *neuroticism* (Beta=0.16; $p=0.001$) predicted the probability of the willingness to childbearing and a similar connection was noted in the case of dispositional optimism as well (Beta=0.15; $p=0.005$). On the other hand, higher age (Beta=-0.15; $p<0.001$) and a higher score on the *openness* subscale (Beta=-0.14; $p=0.001$) reduced the probability of the willingness to childbearing.

	Beta	t-value	p-value
Constant		7.85	0.000
Age	-0.157	-3.53	0.000
Representation of motherhood: Motherhood as female identity	0.412	8.59	0.000
Representation of motherhood: Motherhood as burden	-0.176	-4.27	0.000
BFI: Agreeableness	0.091	2.10	0.036
BFI: Neuroticism	0.166	3.21	0.001
BFI : Openness	-0.147	-3.43	0.001
LOT: Dispositional optimism	0.152	2.79	0.005
Has it ever occurred to you that you may have fertility problems?	0.129	3.15	0.002

Table 1. The significant values in the multiple linear regression analysis.

Dependent variable: Willingness to childbearing. Nagelkerke $R^2=0.34$.

2. Psychosocial determinants of coping with a future fertility problem

Couples experiencing a fertility problem have to decide whether they choose between fertility treatment and adoption or accept childlessness. In my research I sought to identify the psychosocial characteristics which determine these three decision alternatives. Let me state the most important results.

The higher probability of the future choice of assisted reproduction was predicted by a stronger commitment to motherhood: experiencing motherhood as a female identity (Beta=0.145; p=0.014) and childbearing as an important life goal (Beta=0.31; p<0.001). Two variables showed an inverse connection: the probability of choosing assisted reproduction decreases in case of individuals accepting the rules of the church (Beta=-0.10; p=0.024) and those who experience motherhood as a mandatory role (Beta=-0.11; p=0.032).

The role of representations resurfaced again in the acceptance of childlessness. Among people with an infertility problem, those experiencing motherhood as a burden are rather inclined to give up having a child (Beta=0.163; p=0.001). Those respecting church rules are more likely to accept the situation (Beta=0.09; p=0.045) because they less often seem to consider assisted reproduction as an option. Finally, those individuals who defined career building as an important life goal are also more likely to accept living without a child (Beta=0.126; p=0.014).

The probability of choosing adoption was predicted by the willingness to childbearing (Beta=0.15; p=0.014). Among individual variables, the probability of choosing adoption was increased by *agreeableness* (Beta=0.20; p<0.001) while decreased by a higher score on the subscale of *conscientiousness* (Beta=-0.12; p=0.027).

3. Psychosocial determinants of fertility consciousness

By fertility consciousness I mean knowing about the risk factors of reproduction, being aware of biological processes as well as recognizing misbeliefs. Fertility consciousness was significantly predicted by a younger age (Beta=-0.11, p=0.038) and an increased risk perception of the fertility problem. The representations regarding motherhood played a role here as well: a conscious preparation for motherhood predicted a higher fertility consciousness (Beta=0.14, p=0.005), while experiencing motherhood as a mandatory role lowered the level of fertility consciousness (Beta=-0.11, p=0.040).

	Beta	t-value	p-value
Constant		9.44	0.000
Age	-0.11	-2.08	0.038
Has it ever occurred to you that you may have fertility problems?	0.11	2.41	0.016
Representation of motherhood: conscious preparation for motherhood	0.14	2.80	0.005
Representation of motherhood: Motherhood as mandatory role	-0.11	-2.06	0.040

Table 2. Psychosocial variables determining fertility consciousness. Nagelkerke $R^2=0.072$.

Summary

In my first study in the field of reproductivity I approached the issue of infertility in a wider perspective. I explored what female university students know of and believe about fertility, reproductive health, motherhood, infertility and its treatments. My results added several new pieces of information to our knowledge of reproductive health. The representations about fertility proved to be essential. Summing up, we can say that, beside the socialdemographic characteristics, these psychosocial constructions can also influence the willingness to childbearing, the health behaviour regarding fertility, as well as the anticipated coping methods which an individual with a fertility problem could choose. We have to focus on identifying and - if necessary - transforming attitude shaping beliefs because they can have an impact on the psychological well-being of women.

A few important results of the study:

On the whole, the reproductive health behaviour of middle class female university students did not show sufficiently adaptive behaviour profile in my study. Although a high percentage were aware of the reproductive risk factors, a large number of them practiced risky health behaviours.

The fertility consciousness (the totality of reproductive representations) governs the care of the own fertility potential and it provides cognitive resources that determine the individual choices in reproductive health. In this regard my results showed that in many cases the knowledge regarding fertility was inaccurate. In some respects, the individuals overestimated their reproductive capacity while in other respects, however, they underestimated the normal rates of conception potential. Furthermore, my research confirmed that a relatively high number of female university students believe in fertility myths claiming to improve fertility and to help conception. A significant part of the sample (82%) has a

positive attitude toward childbearing. This attitude mirrors the statistic result of a larger demographic sample (Kapitány and Spéder, 2012). My results have confirmed that there is a tendency in the subjective evaluation of women to postpone the ideal time of childbirth. In the background of the postponement of childbearing we may also suspect some psychosocial variables. Among these, the representations of becoming a parent are also essential.

In my study I examined four representations of motherhood: (1) the idea that sees motherhood as part of female identity (2) as mandatory behaviour (3) and as a burden for women (4) the idea that one has to consciously prepare for motherhood. Most individuals experience motherhood as the natural part of the female identity. The conscious preparation for motherhood proved to be a very strong tendency, that means primarily establishing financial security. Only a few considered motherhood as a mandatory role or burden but these attitudes were also present.

Examining the alternatives of coping with a fertility problem I found that the Hungarian female university students do not prefer the childless lifestyle. The results showed that only 8% could accept childlessness without hesitation. They also displayed a substantial openness toward assisted reproduction: 60% of the individuals would choose it with certainty and 20% stated that they most likely would try it in case of a future infertility problem. Lastly, the attitudes toward adoption demonstrated insecurity, especially if considered as an individual choice, rather than a couple's decision.

2. The mediator variables of psychological well-being and of successful ART treatment

Aim

My second, prospective study was more clinically focused examining the psychosocial characteristics of women preparing for assisted reproductive treatment and coping with an infertility problem. In this framework I asked three essential questions. (1) Firstly, I examined the psychosocial variables and coping strategies that help the individual reduce the infertility-related distress during ART treatment. (2) Secondly, I searched for psychosocial variables predicting the reproductive success (live birth) after treatment. (3) Finally, I looked for coping and stress pattern groups relaying on demographic, psychosocial and infertility-related variables in order to define the typical characteristics of the risk group, which enables us to choose the right form of therapeutic help for them.

Method

In the first data-collecting phase (T1) I collected information about the psychosocial characteristics of women and men (n=106) coping with infertility. The questionnaire package was completed in infertility clinics. The only important criterion was that the person was waiting to undergo an assisted reproductive procedure.

9 months later, in the second phase of the survey (T2) I asked for a feedback about the reproductive success, i.e. whether the ART treatment was followed by live birth. In the final analysis I only used the data of female patients reporting about their reproductive success in T2 (n=72). I compared the indicators of reproductive success with the previous psychosocial variables.

The questionnaire served for mapping the infertility-related distress and the coping and communicative strategies. The general measurements examined the negative and positive emotionality (PANAS, Watson et al, 1988), the depression (BDI-H, Beck et al, 1961) and the trait anxiety, respectively (STAI-T, Spielberger et al, 1983). The infertility-related measurements were developed by the Danish research group COMPI (The Copenhagen Multi-centre Psychosocial Infertility, Schmidt et al, 2003). I used questionnaires for assessing distress (COMPI Infertility Problem Stress Scales), coping strategies (COMPI Coping Strategies Scales) relationship satisfaction and communication quality, respectively (COMPI Marital Benefit Measure, COMPI Partner Communication). The statistical methods applied were: multiple linear regression analysis, binary logistic regression analysis and K-means cluster analysis. The dependent variables of the multiple linear regression analysis were the personal, marital and social infertility-related distress while the dependent variable of the binary logistic regression was reproductive success (live birth).

Results

1. The effect of psychosocial variables on infertility-related distress

The psychosocial variables determine the infertility-related stress to a great extent. The avoidance coping proved to be significant (Beta=0.52, $p<0.001$): the more the individual attempts to use emotional and behavioural avoidance, the higher is the probability of the infertility-related distress. The higher frequency of negative affects increased the stress level as well (Beta=0.27, $p=0.006$) but the marital benefit (Beta=-0.24, $p=0.001$) and the quality of communication (Beta=-0.18, $p=0.013$) predicted the contrary. The predictive power of the final model is Nagelkerke $R^2=0.738$.

	Beta	t-value	p-value
Constant		4.97	0.000
Avoidance coping	0.52	5.73	0.000
Negative affects	0.26	2.85	0.006
Marital benefit	0	-3.34	0.001
Partner communication	-0.17	-2.57	0.013

Table 3. results of the multiple linear regression analysis. Dependent variable: Infertility-related distress. Nagelkerke $R^2=0.738$.

2. The impact of psychosocial variables on reproductive success

Regarding reproductive success, 25% individuals in the sample gave birth to a child in T2 while in 75% of the cases the ART treatment was unsuccessful.

The binary logistic regression model showed that reproductive success is less likely with increasing age (OR = 0.549, $p = 0.009$) and level of trait anxiety (OR = 0.815, $p = 0.038$) but it increases with the more frequent use of problem restructuring coping (looking for a meaning, low level of need for controlling the situation, optimism, spiritual beliefs, OR = 2.514, $p = 0.004$). The increase of infertility-related distress (OR=1.436, $p=0.051$) enhances the chance of live birth as well but the effect remains around the limit of significance level, thus we can merely speak of a tendency.

	OR	95% confidence interval (OR)	p-value
Age	0.549	0.34-.86	0.009
Trait Anxiety	0.815	0.67-.98	0.038
Infertility-related distress	1.436	0.99-2.06	0.051
Problem-restructuring coping	2.514	1.35-4.67	0.004

Table 4. Results of binary logistic regression analysis. Dependent variable: live birth.

Nagelkerke $R^2=0.731$.

(3) Typical psychosocial patterns of coping with an infertility treatment

In my study, I looked for typical psychosocial patterns which can be used to distinguish the groups of individuals coping with infertility. In the K-means cluster analysis I identified four groups according to these cluster centers:

CLUSTERS	1	2	3	4
Cluster centers				
Age	30	37	33	33
Number of previous ART treatments	2	4	3	4
Trait Anxiety	36	31	47	65
Depression	10	10	13	21
Infertility-related distress	22	17	26	32
Avoidance coping	13	11	16	20
Emotionally focused coping	13	13	15	16
Problem-restructuring coping	15	15	14	14
Marital benefit	8	8	7	7

Table 5. Results of the K-means clusteranalysis.

The groups can be labelled as follows:

1. cluster (well-adjusted patients): A group of young patients with lower distress level, adaptive coping strategies and good biological predispositions (age, number of treatments). 19 individuals in the sample were part of this group.
2. cluster: (*well-adjusted, older patients*): a group of individuals having a lower level of distress and adaptive coping strategies but less favourable biological predispositions (age, number of treatments). Three individuals in the sample belonged to this group.
3. cluster (*maladjusted patients*): a group of individuals with a moderately high but still below-clinical level distress score. The group practised a variety of coping strategies. Good biological predispositions. The group of maladjusted patients included 17 patients.
4. cluster (*psychologically vulnerable patients*): this group had the highest distress indicators.

Both the depression and anxiety scores showed clinically significant distress rates. The rates of infertility-related distress were also elevated. The high psychological distress went hand in hand with the frequent use of avoidance coping strategy. Simultaneously, the marital benefit in this group was lower. There was a total of 5 individuals in the psychologically vulnerable group.

Further results showed (Games-Howell post hoc analysis) that regarding reproductive success the well-adjusted group had significantly more live births than the psychologically vulnerable group ($I_{1\text{klaszer}}-J_{4\text{klaszer}}=0.31, p=0.045$) and I found a substantial difference between the well-adjusted older patients and the psychologically vulnerable individuals ($I_{2\text{klaszer}}-J_{4\text{klaszer}}=0.25, p=0.015$). Outstanding is the fact that in T2 none of the psychologically vulnerable had a child.

Summary

To sum up, the study results showed that the psychosocial variables play an important part in the life situation of infertility in two respects.

On one hand, the elevated level of negative affectivity and the frequent use of avoidance coping proved to be risk factors regarding the psychological well-being while marital benefit and better partner communication turned out to be protective factors. I examined the infertility-related distress in various areas: in personal, marital and social aspects. The results indicated that the avoidance coping strategy increased the distress both in intrapsychological and interpersonal aspects which suggests that psychosocial counselling must include the teaching of adaptive coping strategies (Schmidt et al, 2005b). Regarding partner relationship distress, the level of marital benefit was more significant and therefore it can also be a protective factor in long-term adjustment (Wirtberg et al, 2007). In a social aspect it could be important to pay attention to the issue of depression because the frequency of depressive symptoms predicted the elevated level of social distress that can lead to social isolation (Lapane et al, 1997).

On the other hand, I examined the psychosocial variables with regard to reproductive success. Elevated trait anxiety and higher age proved to be risk factors while the frequent use of problem-restructuring coping and infertility-related distress increased the chances of live birth. The results confirmed the significance of choosing the right strategy while coping with infertility. The individual's openness toward alternative life goals, looking for a meaning, optimism, adapting to the low control situation create better conditions for reproductive

success. In relation to infertility-related distress we can conclude that the situation-related, moderate stress increases the probability of conception because the individual uses fewer problem-evading techniques that can enhance reproductive success.

Finally, I was able to distinguish four typical psychosocial patterns in the sample. The groups differed mainly in respect of distress and coping strategies. I found better reproductive indicators in the well-adjusted groups while the worst ones in the psychologically vulnerable group.

The clinical significance of the results consists in the insight that it should be essential to psychologically help the vulnerable group during the ART treatment while trainings that teach adaptive coping techniques could enhance both the psychological well-being of patients and their reproductive success. (Boivin, 2003).

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