Doctoral School of Interdisciplinary Medicine

Impact of paramedical counseling on infertile male patients' coping strategies and care satisfaction

Summary of Ph.D. Thesis

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INTRODUCTION

Although several approaches, including biomedical and psychosocial, define infertility, most of them describe it as a female's inability to become pregnant from a medical perspective (Lakatos, et al., 2014). Even though minor changes have been made to it, the definition employed by the WHO has been accepted for more than a decade: 'Infertility is the disease of the reproductive system when pregnancy does not occur despite regular sexual intercourse without using contraception for 12 months'. Since reproduction is essential, both individual and social difficulties in this aspect place an immense psychological burden on the infertile couple (Chiaffarino, et al., 2011; Kahyaoglu & Balkanli, 2015). Almost 15%–20% of couples in developed countries face the problem of infertility (Policy Audit on Fertility, 2017). According to European data, the number of couples receiving infertility treatment is increasing. This tendency has also been observed in Hungary (Kaáli & Bártfai, 2018). In Hungary, approximately 24% of couples are unwillingly childless; in other words, one out of four couples have an infertility problem (Hungarian Central Statistical Office, 2014). Studies have shown that in 50% of infertile couples, only the male partner or both partners are affected (Jungwirth, et al., 2017).

In addition to the known organic reasons, many lifestyle and environmental factors can be expected to contribute to this.

According to the 2017 male infertility guidelines of the European Association of Urology with the use of up-to-date diagnostics and treatments 3% of women remains childless and 6% is unable to give birth as many times as they want (Jungwirth, et al., 2017). The cumulative pregnancy ratio in a two years follow-up period is 27% among couples where the primary reason for infertility was oligozoospermia. The age of the woman is the main variable altering the outcome in assisted reproduction. Comparing the reproductive potential of 25-year-old women with 35-year-old women it shows a decrease to 50%, at the age of 38 the decrease is to 25%, above 40 years it is to 5%. It is widely known that in western countries women postpone their first pregnancy after finishing education and setting up a carrier (Jungwirth, et al., 2017).

After excluding described several etiological factors of male infertility, an alteration in the parameters of the sperms (concentration, motility and morphology) often persists although its cause is not entirely clear yet. Consequently, the role of endocrinological disruptors due to pollution and relative oxygen species is assumed (Schill, et al., 2006).

According to the 2017 guidelines of the European Association of Urology on male infertility, infertility of an unknown origin (idiopathic) is given in 31% of all cases (Jungwirth, et al., 2017). In previous decades during which the development and persistence of idiopathic infertility was examined, a significant role was attributed to the individual's or the couple's psychopathology, thus, mixing psychogenic and idiopathic infertility.

The biopsychosocial theoretical model of infertility allows us to interpret the lack of fertility, not only from the medical point of view, but also as a psychosocial phenomenon.

Being able to reproduce is an important part of one's identity. Consequently, patients experience infertility as a major stressful life event. Being unwillingly childless increases the occurrence of anxiety and depression and concurrently, decreases quality of life (Cserepes, et al., 2014; El Kissi, et al., 2013).

Males experience significant distress when they experience infertility. Furthermore, anxiety, a decrease in self-esteem and stigmatization may be more prominent in male factor infertility than in idiopathic or female factor infertility (Furman, et al., 2010; Petok, 2015; Throsby & Gill, 2004).

Several lifestyle factors might underlie infertility issues. Body mass problems, smoking and drinking excessive amounts of alcohol decrease fertility (Du Plessis, et al., 2015; Kort, et al., 2016; Waylen, et al., 2009). Furthermore, an unhealthy diet, lack of physical activity and environmental harmful factors are associated with the unfavourable functioning of the reproductive organs. The outlined empirical findings suggest that infertility treatments can be augmented with lifestyle programmes that can enhance fertility effectively and in which patients can participate during medical treatment (Wise, et al., 2011).

Thus, it is important to develop complex programmes that respect the integrity of the body and the soul, that consider infertility problems to be a relationship issue and that suit the requirements of the patients perfectly (Brucker & McKenry, 2004; Domar, 2015; Randi et al., 2016; Stevenson, et al., 2016; Szatmári, et al., 2018; Van den Broeck, et al., 2010).

Programs designed to change adverse health behaviors can be effective elements in the management of infertility (Hammarberg, 2010).

To properly treat infertility and associated comorbidities and to prevent possible complications, patients need to learn new skills and increase their knowledge. The results of studies exploring the need for interventions and targeted programs suggest that comprehensive clinical care among infertility services is particularly important in protecting the emotional well-being of men experiencing infertility. Men are increasingly likely to trust someone and are eager for information and emotional support.

Although information is available to patients through many channels, especially the Internet, the reliability, and quality of this information are not always guaranteed. After consulting with a physician, it is common for men experiencing infertility to seek information about help in decision-making (Baunacke, 2018).

Personalized patient education is significantly more effective if, in personal consultations, all patients have access to information appropriate for their prior knowledge, literacy, current needs, and psychosocial status (Roter & Hall, 2004).

For this reason, professional psychological assistance has received more emphasis for the treatment of infertile couples (Boivin & Gamerio, 2015; Hakim, et al., 2012).

The use of counseling strategies will enable a person in need to obtain information, develop new skills, and develop new habits (Kitto, et al., 2015; Legare, et al., 2008).

The main task of patient-focused counseling is to assure that patients understand the consequences of their choice of treatment, provide sufficient emotional support and cope with the consequences of experiencing infertility in a healthy way.

So, health workers, nurses and medicals dealing with infertile male patients should devote a special and high attention to the patient conducting and paramedical counseling as supportive therapy. In the frame of it – besides giving information – the individual support contributes to the elaboration of information, arising effects and experiences furthermore to the development of adaptive coping strategies for stress, and to the modification of direct or indirect changes in health behavior affecting reproductive health during the treatment period.

AIMS OF THE STUDY

The aim of this study was to assess the efficacy of the method of paramedical counseling provided by nursing during the treatment period for male factor infertility by employing the used patient conducting model developed during the last decade, that can be applied in daily practice. Furthermore, the impact of the infertility counseling on the development of infertile males' adaptive health behaviours that influence reproduction by broadening the knowledge of the patients during the treatment process and promoting positive change based on satisfaction rates was assessed.

The hypothesis of this study is that patient conducting supported by the method of paramedical counseling contributes to both patient satisfaction and participation in the entire program, from beginning to end, as assessed by a questionnaire.

We hypothesised that infertility counseling as a method of the patient conducting process due to supporting the coping strategies of the observed group will become more problem-focused and there will be an improvement in the indicators of well-being.

MATERIAL AND METHODS

The participants included 108 individuals who were suffering from infertility or decreased reproductive capacity. Their ages ranged between 26 and 49 (average=35.18, standard deviation=4.92) years. The involved patients were from the Department of Obstetrics and Gynecology, the Department of Urology and the Infertility Center of Kaáli Institute at the Faculty of Medicine at the University of Szeged.

This study focused exclusively on male factor infertility or decreased fertilization capacity. The patients were divided into two groups: the pilot group, which included persons who received support therapy (n = 57), and the control group, which included those who did not receive support therapy (n = 51). The inclusion criterion for both groups was male factor infertility or decreased reproductive capacity.

According to clinical diagnoses, there were three subgroups: (1) azoospermia (n=24); (2) OAT syndrome (oligoasthenoteratozoospermia) (n=51), oligoasthenozoospermia (n=4) and oligozoospermia (n=19); and (3) unexplained infertility (of unknown origin) (n=10).

During the evaluation, we assessed vulnerability in both groups. The results of psychological questionnaires, the level of depression, anxiety and perceived stress, indirectly refer to vulnerability. The questionnaires were employed to assess the distress accompanying infertility as well as the coping and communication strategies the patients suffering from infertility used. In accordance with the literature, we used general test batteries to assess distress, which measured the occurrence of depressive symptoms and level of anxiety. These questionnaires had all been widely employed in studies examining groups of patients suffering from other diseases, healthy populations and infertile patients.

The short version of the Beck Depression Inventory was used to measure depression and Perczel's (2005) version of The State-Trait Anxiety Inventory (STAI) originally developed by Spielberger (1970) was employed to measure trait anxiety. Other measures employed included the Rosenberg Self-Esteem Scale to measure self-esteem; Caldwell's Social Support Questionnaire to assess social support; the Perceived Stress Scale to measure perceived stress; the satisfaction with life subscale of the Rahe Stress and Coping Inventory to identify coping

strategies and the conflict resolution questionnaire (Ways of Coping Questionnaire) (WCQ). The participants also answered short questions on health behaviours including smoking, alcohol intake, healthy diet, physical activity and environmental harmful factors.

Questionnaires to assess psychological vulnerability were completed in the first phase of treatment after being diagnosed with (1) or with a previously known and treated infertility (2), but prior to any operation, insemination or ART.

In the observed group, the validated questionnaires were completed at the start of medical interventions, in the first phase of counseling and after counseling at the end of the four months period. The control group only completed the validated questionnaires at the beginning and end of the medical treatment, they did not receive infertility counseling. After a thorough examination of the patients and after their reactions to, and awareness of the disease were assessed, the observed group during a four-month period received counseling and support altogether five times at three weeks intervals. Patient suffering from infertility or decreased fertility were involved in both groups (observed and control). They were provided counseling after randomization.

Infertility counseling there is three pillars: (1) emotional support, (2) providing information about the treatment (3) and evaluation which entails screening psychological vulnerability.
The interventions were standardized based on pre-set programs. Consultation was conducted according to these programs. Patient satisfaction was assessed using an anonymous questionnaire developed for this research.

Data processing and evaluation were conducted by employing IBM SPSS version 25. We performed descriptive statistics, a chi-squared test, Fisher's exact test, two sample t-test, Welch's t-test, repeated measures multivariate analysis of covariance and Spearman's rank correlation to evaluate the demographic characteristics and data of the clinical scales. Statistical significance was defined as $p < 0.05$. In accordance with the consensus, 95% confidence intervals are shown in the figures. The effects of the therapy were examined by the Wilcoxon rank test.

Ethics approval was obtained from the medical directors of the infertility and andrology clinics. All the participants volunteered, they received written information about the study and they signed a declaration of consent prior to completing the questionnaires (Human Investigation Review Board University of Szeged, Albert Szent-Györgyi Clinical Centre, University of Szeged (82/2017-SZTE).

RESULTS

Sample data were compared using the frequency and average of the control (n = 51) and pilot (n = 57) groups. More than half of the patients surveyed had obtained a higher education, nearly two-thirds were married, and three-quarters lived in cities. In terms of nutrition, nearly 50% were moderate, with 30% paying full attention to healthy eating. Nearly 80% of patients did not smoke, and they had similar rates of alcohol consumption. No significant difference was observed in the demographic characteristics between the groups, except for the time of infertility diagnosis, for which the two groups exhibited significant differences. In the pilot group, the diagnosis was made in the past (t = 3.1; DF = 82,457; p = 0.003) and the difference between the two groups at the time of attempting family planning. On average, the participants in the pilot group had been trying to start a family for an extended period of time (t = 2.48; DF = 90.89; p = 0.02).

In the therapy group, 77% played sports on a weekly basis, compared with only 35% in the control group (χ^2 = 22.36; DF = 2; p < 0.001). There was no significant difference in the frequency of playing sport between the two groups (χ^2 = 4.335; DF = 2; p < 0.114).

To test the hypothesis of the study, we first examined the clinical characteristics of the control and observed groups at the start so as to reduce bias due to potential differences. According to statistics in WCQ's problem analysis (t=0.47; DF=106; p=0.64; mean difference=-0.06; CI-=-0.33; CI+=0.2; Cohen's d=0.09), emotionally motivated action (t=0.25; DF=106; p=0.81; mean difference=-0.02; CI-=-0.2; CI+=0.15; Cohen's d=0.05), purposeful action (t=0.18; DF=106; p=0.86; mean difference=0.018; CI-=-0.19; CI+=0.23; Cohen's d=0.03), adaptation (t=-1.36; DF=106; p=0.18; mean difference=-0.17; CI-=-0.43; CI+=0.08; Cohen's d=0.26), asking for help (t=-0.64; DF=106; p=0.52; mean difference=-0.09; CI-=-0.36; CI+=0.19; Cohen's d=0.12), seeking emotional balance (t=-0.89; DF=106; p=0.38; mean difference=0.21; CI-=-0.26; CI+=0.68; Cohen's d=0.18), scales in the STAI result (t=-0.05; DF=106; p=0.96; mean difference=-0.03; CI-=-1.44; CI+=1.37; Cohen's d=0.01), in the BDI result (t=-0.07; DF=106; 0.94; mean difference=-0.06; CI-=-1.57; CI+=1.46; Cohen's d=0.01), in the RSES result (t=0.14; DF=106; p=0,89; mean difference=0.01; CI-=-0.16; CI+=0.18; Cohen's d=0.03) and in the results of Holmes-Rahe test (t=0.06; DF=106; p=0.95; mean difference=0.03; CI-=-0.96; CI+=1.02; Cohen's d=0.01), there was no difference at the start. The withdrawal scale of the WCQ showed a difference at the start (t=-2.26; DF= 106; p=0.03; mean difference=-0.37; CI-=-0.71; CI+=-0.05; Cohen's d=0.44).

According to the evaluation, the time elapsed during the examination (F = 3.2; DF = 12-93; p = 0.001; partial eta squared = 0,29) had a significant main effect. Furthermore, the interaction between the elapsed time and the intervention was also significant (F = 7.53; DF = 12-93; p<0.001; partial eta squared = 0,49).

When comparing the data of the tests at the two occasions of measurement, a significant change in the BDI results (F = 10.44; DF = 1-104; p=0.002; partial eta squared = 0,09), in the STAI results (F = 8.82; DF = 1-104; p = 0.004; partial eta squared = 0,08), in the emotionally motivated action scale of WCQ (F = 7.89; DF = 1-104; p = 0.006; partial eta squared = 0,07) was evident; all three decreased. The interaction capturing the effect of the intervention was significant in the withdrawal (F = 3.96; DF = 1-104; p = 0.049; partial eta squared = 0,04), purposeful action (F = 58.75; DF = 1-104; p < 0.001; partial eta squared = 0,36) and seeking emotional balance (F = 4.68; DF = 1-104; p = 0.033; partial eta squared = 0,043) scales of WCQ and in STAI results (F = 4.33; DF = 1-104; p = 0.04; partial eta squared = 0,04). The withdrawal and purposeful action results of WCQ increased in the observed group while they decreased in the control group. Seeking emotional balance and trait anxiety of the STAI results decreased in the observed group and trait anxiety of the STAI results did not change with time in the control group.

We found a significant change in the pilot group with respect to their attitude toward the disease as a result of therapy ($z = 3.260$, $p = 0.000$, v = 157; $p = 0.001$). Of the 39 potentially adequate patients, 11 had become adequate, and five of the seven patients with an aversive attitude had become potentially adequate.

With regard to emotional state, 18 of the 44 patients who previously struggled with inertia, low self-esteem, and anxiety became energy mobilizing ($z = -3.452$, $p = 0.001$, v = 327.5; $p < 0.001$). Eight of the 41 patients who used emotion-focused coping strategies switched to problem-focused coping strategies. Of the 28 patients who used avoiding strategies, two switched to problem-focused strategies and 13 switched to emotion-focused strategies while asking for help strategies ($z = -3.658$, $p = 0.000$ v = 236; $p < 0.001$). The time elapsed since the diagnosis of infertility was significantly longer in patients who used problem-focused coping strategies than in those who used emotion-focused strategies ($t = 2.479$, $p = 0.024$, $p = 0.001$).

In terms of patient satisfaction, 97% of the respondents in the research group reported that supporting therapy was important. A total of 86% of patients indicated that supportive therapy contributed significantly to the expansion of their knowledge of the root cause of their infertility.

A total of 89.4% of patients felt that they had knowledge of the course of the investigation, 82.4% of patients had knowledge of the therapeutic options, and 73.7% of patients had knowledge of health promotion.

DISCUSSION

Infertility clinics should provide their clients with more apparent and traceable treatment in order to enable them to apply more coping strategies during difficult times and to support both partners. Studies were conducted in 2010 to explore how males appreciate a supportive group during assisted reproductive treatment. The participants showed a positive reaction towards the counseling and believed they could talk about their problem in an accepting environment. It is noteworthy that those males who sought counseling suffered primarily from male factor infertility. This guided us in choosing the target group. We were curious about the patients' conditions after diagnosis and how supportive therapy could help them. Decreasing depression and anxiety is not only important for their relationship, but clinical findings also verified that there is an inverse relationship between psychological stress and the parameters of the sperms even though its effect is mainly measurable in the group of patients with decreased fertility (Wdowiak, 2017; Nargund, 2015) and it can also lead to leaving the treatment. Therefore, a non-pharmaceutical decrease in anxiety and stress and providing information and coping strategies may be crucial.

Our study highlighted how the group that received interventions had an intense awareness of the diagnosis and the aims and nature of the indicated treatment. This group used purposeful problem-solving coping strategies during the infertility treatment. As a result of the interventions during the fourth and fifth meeting the persons in the observed group used adaptive coping strategies, e. g. problem analysis and purposeful action more frequently. While infertility treatments can be exhaustive, the person's sense of security was increased by the transparency of examinations, by the predictability of the treatment and by the thorough knowledge of the clinic and its staff. According to the cognitive model long-term adaptation is facilitated by problem analysis, since the person makes efforts in stressful situations with low control. Those persons who reevaluate childlessness experience significant decrease in stress levels when coping with infertility. The patients reported they were satisfied with the intervention. Their levels of depression and anxiety decreased from those observed at the start of the interventions and differed from the control group's results.

Because this study was limited by the number of participants, we did not evaluate the characteristics of coping strategies in the different subgroups so as to apply personalised therapies according to their diagnosis. Consequently, this remains a goal for further studies.

Infertility treatment strategies usually focus on women, and men are given little attention. This can be a problem as men ask fewer questions during medical consultations. Moreover, they tend to have less information about their situation (Daumler, 2016).

Person-centered care should be used by all clinical staff because lack of service can have a negative impact on the patient's psychological well-being. Biovin et al.'s results could be attributed to the premature interruption of assisted reproductive treatments due to an increase in relationship problems, the choice of a new life goal, advanced age, or many unsuccessful attempts (Biovin, et al., 2011). However, it is necessary that, in addition to the possible causes of infertility, couples should identify the distress that is most important. Clients have been a source of stress by the following factors: the nature of the clinics, frequent changes in medical staff, an impersonal, non-supportive medical environment, and disorganized and unpredictable treatment schedule.

Satisfaction with infertility centers and the effect of satisfaction on infertility distress was assessed in an international survey. Data was collected from four infertility centers. The results revealed that patients were satisfied with the work of the clinics. Furthermore, the information provided in relation to their problem and their relationship with their doctors was satisfactory. Nevertheless, emotional support provided by the medical team was considered to be scarce and not much information in connection with the mental consequences of infertility was given to the patients. Although the patients generally were satisfied with the patient-doctor communication, they perceived the information provided by the institutions and professionals' willingness to be insufficient. The results of this survey supported previous experience that demonstrated that satisfaction indicators and infertility distress are closely related. The more satisfactory the medical and psychosocial information were and the more satisfied the persons were with the center, the less pronounced infertility distress was (Daumler, et al., 2016; Hammarberg, et al., 2010; Randi, et al., 2016).

The results of our study, which was performed among infertile male patients, are consistent with the international data. In terms of patient satisfaction, 97% of the respondents in the research group reported that supporting therapy was important. The men who received counseling had a positive experience in counseling and received new information. The intervention was able to increase various aspects of men's fertility awareness.

Patients indicated that supportive therapy contributed significantly to the expansion of their knowledge of the root cause of their infertility. Patients felt that they had knowledge of the course of the investigation, patients had knowledge of the therapeutic options, and patients had knowledge of health promotion.

CONCLUSIONS

In summary, patients with infertility problems should be provided with better psychological well-being with the active involvement of professionals. In addition, they should receive effective, targeted, and problem-specific assistance. There is very little attention to support the processing of effects, experiences and knowledge during the actual treatment period.

The basic task of patient conducting is to ensure that patients understand the consequences of their treatment choices, receive sufficient emotional support, and have the tools available to cope with the consequences of experiencing infertility in a healthy way. It is recommended that paramedical counseling be organized around the guidelines described above, in an individual and/or couple therapy form, and be available to patients throughout the treatment duration.

Research results suggest that fewer couples are expected to interrupt their participation in the reproductive program. With the use of patient guidance fertility awareness in infertile men can be increased. Minimalization of unfavorable coping strategies and enhancing a sense of competence.

Targeted interventions and programs in the field of care could help to exploit the possibilities arising from more or less modifiable lifestyle variables under a person's control in the field of nursing care.

Infertility clinics should provide their patients with clear and traceable treatment in order to enable them to apply various coping strategies during difficult periods and ensure that both the female and the male partner receive support.

According to the findings above we can state that it is a compelling task for medical and nursing professionals working in assisted reproductive treatment to adapt infertility centers to provide the patient conducting process by a holistic approach. To achieve that infertility centers become a supportive environment where people wishing to have a child can cope with their temporary or permanent childlessness being involved in decision situations by professional cooperation and social acceptance should be the biggest aim of the near future.

Publications related to the Thesis

I. Szatmári, A., Fejes, Zs., Király, I. (2018). A férfiak férfimeddőséggel kapcsolatos ismeretei és a támogatás lehetőségei: kockázati tényezők és egyéni válaszreakciók, *Orvosi Hetilap*, 159(31): 1263–1269. DOI: 10.1556/650.2018.31132.

II. Szatmári, A., Helembai, K., Zádori, J., Dudás, E. I., Fejes, Zs., Drótos, G., Rafael, B. (2020). Adaptive coping strategies in male infertility, paramedical counselling as a way of support. *Journal of Reproductive and Infant Psychology* doi.org: 10.1080/02646838.2020.1724918.

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