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IDENTIFYING WOMEN WITH PSYCHOLOGICAL PROBLEMS DURING THE IN VITRO FERTILIZATION PROCESS: THE PSYCHOLOGICAL EVALUATION TEST (PET)

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Abstract. *Especially strong or inadequate emotional reactions during in vitro fertilization (IVF) treatment may affect both the success of the treatment and later mental health. This study tested the possibility of using Psychological Evaluation Test for Infertile Couples (PET) scores to identify women with psychological problems during the IVF process, so that they can be offered psychological counseling. The sample comprised 158 women, all of whom were undergoing the IVF treatment at the time of the study, and 128 women who had at least one child conceived without difficulties. All of the respondents filled in a questionnaire concerning their emotional status and coping competencies, while the PET was given only to the respondents undergoing IVF. Respondents with higher PET scores (> 30) have significantly higher Negative Affectivity and Shame in front of others, and lower Positive Affectivity and Coping competencies than the group with low PET scores (≤ 30) and women who conceived without difficulties. Respondents with lower PET scores do not significantly differ from women who conceived without difficulties. The results obtained suggest that the PET cut-off score > 30 may be considered a reliable measure to identify women with psychological problems i.e., reaching scores of > 30 can be taken as an indicator of the need for psychological support.*

Key words: *psychological evaluation, in vitro fertilization, emotions, coping, psychological support*

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1. INTRODUCTION

In many European countries, psychological counseling during the in vitro fertilization (IVF) process is not an integral part of the treatment. This is a significant disadvantage in access to infertility treatments and leads to the conclusion that "psychological counseling should be offered in the framework of fertility investigations and treatments" (European Policy Audit on Fertility, 56). On the other hand, offered support does not necessarily mean that everyone will accept it, although it could potentially be necessary for some persons. Do some women undergoing the IVF process really need support more than others, and how do we recognize them?

Clinically, infertility is defined as "a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse" (WHO-ICMART revised glossary of ART terminology 2009). The most commonly applied procedures of assisted reproductive technology (ART) for overcoming infertility are in vitro fertilization (IVF) and intracytoplasmic sperm injection (ICSI) (Präg & Mills 2017). These two procedures are different only in the way an egg cell is fertilized; for a woman that undergoes ART there is no difference in the procedure.

Infertility, and reproductive health in general, have very pronounced psychosocial aspects, which have been recognized by the European Society of Human Reproduction and Embryology (ESHRE) since 1993, when the Special Interest Group Psychology and Counseling was founded. An article summarizing the proceedings of the first campus workshop of this Special Interest Group states that infertility is a biopsychosocial crisis, and infertility counseling is recommended as an integral part of a multidisciplinary approach to treatment (Van den Broeck et al. 2010). Counseling allows exploring and defining new ways of satisfaction-filled living according to a person's value system despite diagnosed fertility impairments. The content of infertility counseling will vary depending on what the person/ couple faces: the IVF cycle (first, repeated, unsuccessful), considering the possibility of third-party reproduction, adoption, or life without children. The paper focuses on women who need counseling during the ART cycle (referring to both the classic IVF and ICSI methods).

Since early studies on the psychological aspects of the ART process, there has been an opinion that infertile couples are generally mentally healthy (Edelmann et al. 1994; Mazure & Greenfeld 1989), but individual differences in emotional responses do exist (An et al. 2012; Rockliff et al. 2014; Verhaak et al. 2005). It is essential to recognize persons with an especially strong and/or inadequate response to stress, as emotional reactions can affect IVF cycle success – pregnancy rates and later mental health (Frederiksen et al. 2015; Nasseri 2000; Rockliff et al. 2014; Zaami et al. 2021). Typical research findings indicate the occurrence of depression and/or anxiety during the IVF cycle, especially during the period of waiting for results (Boivin & Lancastle 2010; Bringhenti et al. 1997) and after unsuccessful cycles (Nasseri 2000; Verhaak et al. 2005). Furthermore, research also indicates that women have more pronounced symptoms of depression, state anxiety, infertility-specific distress, and general perceived stress than men (Darwiche et al. 2013; Mahlstedt et al. 1987; Wichman et al. 2011). During the psychological evaluation of 200 couples preparing for IVF, half of the women and as little as 15 % of the men reported that infertility was the most unsettling experience in their lives (Freeman, 1985). Although most women cope well with unsuccessful treatment, some women suffer from anxiety and/or depression six months later (Verhaak et al. 2005; Verhaak et al. 2007). Both partners feel sorrow and anger, and women often report shame, self-blame, a sense of failure, and lack of fulfillment (Batool & de Visser

2015; Benyamini et al. 2009; Cunha et al 2016; Gazit & Amichai-Hamburger 2020; Janković & Todorović 2021; Hanna & Gough 2015; Woods et al. 1991). The highest distress is present in women with a perception of little control over the situation in which they find themselves (Benyamini et al. 2009). In reality, it is difficult to control the problem – infertility – during the IVF process, so emotional coping strategies and problem-appraisal coping provide better capacities for adjustment than problem-management strategies or avoidance (Gourounti et al. 2012; Terry & Hynes 1998). Avoidance coping can be recognized as a strategy with low adjusting and increased perceived stress levels during IVF cycles (Cunha et al. 2016; Gourounti et al. 2012; Schmidt et al. 2005). An adequate coping strategy is important because negative feelings are not easy to avoid, according to Batool et al. (2015). Routine interactions with the fertile world – especially pregnant women, keep reminding the infertile woman of her problem and creating a sense of inadequacy and isolation – it seems to her as if everyone can get pregnant, only she cannot. When the IVF treatment results in pregnancy, the negative emotions disappear (Verhaak et al. 2007).

How can we determine which women need psychological support/counseling during infertility treatment? One way may be the women's own decision to ask for psychological support. A study conducted with 235 infertile women undergoing IVF treatment shows that 32.5% of women ask for emotional support (compared to 59.3% of women who believe that they primarily need more medical information, Salakos et al. 2004). However, it can happen that women, for various reasons, do not adequately assess their need for support/counseling. There is no reason to worry in those cases where a woman has adequate coping skills but still wants counseling – she should definitely not be denied counseling. Therefore, it is crucial to identify women who need support and have difficulties in their everyday life, but do not see psychological support as a solution. In this step lies (another) great responsibility of the team engaged in infertility treatment and one of the reasons for including a mental health practitioner as a team member (Jestrović & Mihić 2018; Patel et al. 2018; Sax & Lawson 2022). In determining the indications for counseling, using a measuring instrument – a questionnaire – is more reliable than a woman's own opinion that she needs counseling. ECHRE offers a list of tests (List of tools to detect the needs of patients 2015) that can be used to assess patients' needs. However, some of these tests are not used to assess needs but aim to identify more severe functional problems, regardless of infertility, such as the Beck Depression Inventory (Beck & Beamesderfer 1974). Depressive feelings are rather frequent in women undergoing IVF, but they do not occur in all of them. The root problem can be related to, for instance, relationships with others and social situations, which is not covered by this scale. A similar remark can be made about other tests from this list focusing on only one possible aspect of the problem. This is especially the case with non-fertility-specific tests (e.g., the Mental Health Inventory-5; Patient-centered care questionnaire; Hospital Anxiety and Depression Scale). The list also includes a frequently used multidimensional instrument, the Fertility Quality of Life (Boivin et al. 2011). It is intended for persons with fertility problems and covers different aspects, and it is not long – it contains 36 items, but there are no norms or cut-off scores which would indicate the need for counseling. For that reason, we focused on the PET – Psychological Evaluation Test for Infertile Couples (Franco et al. 2002). It is a simple instrument comprising 15 questions about everyday problems/emotions an infertile woman or man may face. Importantly, there is a defined cut-off score suggested by the authors in their study: if a test score of above 30 is reached, it means that there is a "necessity of more specific psychological advice" (Franco et al. 2002, p. 270). The cut-off

scores were obtained through an analysis of responses given by 251 infertile couples (there was no control group). The present study aims to test the cut-off scores of a sample of women undergoing IVF relative to a control group and thus provide further evidence for PET use adequacy. If the instrument is found valid and confirmed by studies in other countries, we would have a short and reliable tool for critical assessment.

1.1. The Present Study

Aiming to test the possibility of using PET scores to identify women with psychological problems during the IVF process, we used differences in experiencing positive and negative emotions and differences in coping competencies as indicators of psychological problems among women undergoing the IVF process and women with at least one child conceived without difficulties. We started from the following hypotheses, which were based on previous knowledge of the psychological status of women undergoing the IVF process:

1) Respondents in the group with PET scores > 30 significantly differ in their scores on Affectivity, Shame in front of others, and Coping competencies from respondents with lower PET scores and women with at least one child conceived without difficulties;

2) Respondents in the group with PET scores ≤ 30 will not differ from respondents with children in their scores on Affectivity and Shame in front of others, but in their Coping competencies, which are assumed to be highly pronounced in this group.

Before and after testing the hypotheses, we checked the PET factor structure and the effect size of the obtained differences between the groups formed by the PET score, respectively.

2. Materials and Methods

2.1. Study Design

The research was based on a survey in which data was obtained through voluntary participation. The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Ethics Committee of the Faculty of Philosophy, University in Niš. All of the respondents were informed of the purpose of the study, gave their consent, and it was explicitly stated that they could discontinue participation at any time. The research was conducted in the second part of 2018, so the COVID-19 pandemic had no effect on the results obtained. This is important, because COVID-19 had a specific psychological impact on women expecting pregnancy, pregnant women, and women with delayed IVF treatment due to the pandemic (e.g. Campos-Garzón et al. 2021; Mitrović et al. 2021).

2.2. Participants and Procedure

2.2.1. The IVF sample

The sample comprised 158 women undergoing the IVF process during the study (M_{age} = 35.58; *SD* = 5.04). The respondents undergoing the IVF process filled in the questionnaires either in their IVF clinic (n = 63) or online (n = 95) on the website of an organization dedicated to improving conditions of IVF in Serbia (Šansa za roditeljstvo – Chance for Parenthood). In both cases, the criterion was current involvement in the IVF process and

not having any children prior to IVF. None of the included women received any psychological support/counseling.

2.2.2. The non-IVF sample

This sample comprised 128 women who had at least one child conceived without difficulties (M_{age} = 34.37; *SD* = 4.92). The respondents filled in the questionnaire on a website for exchanging experiences in parenting. Apart from the child conceived without difficulties, the inclusion criterion was age, determined by the IVF group age range (23 to 46), and the absence of significant stressors in the last six months.

2.3. Measures

The Psychological Evaluation Test for Infertile Couples (PET), developed by Franco et al. (2002), comprises 15 statements related to different aspects of life in which a person with infertility may have problems, such as social relationships (for example, "Relatives and friends usually ask about the fact that we don't have children and I don't feel well in this situation; I am upset when I am invited to a children's birthday party"), duties and goals (e.g., "Is your professional activity being impaired due to the lack of children? Do you think about your difficulty in having children during daily life?"), self-image ("Do you feel inferior to other women due to not having children? Do you feel a sense of emptiness due to not having children?"), their relationship with the partner ("Is your daily relationship with your husband impaired by not having children? Is your sexual relationship being impaired by the fact that you have not become pregnant until now?"). They responded on a Likert-type scale from 1 = *never or rarely* to 4 = *always*. The test result was the sum of answers to all the items. The authors defined the PET score > 30 points as a cut-off point that indicated the necessity of psychological counseling [35]. The test was adapted for research purposes using backtranslation. Cronbach's alpha coefficient in this study was .91.

The Positive and Negative Affect Schedule, PANAS (Watson et al. 1988; Mihić et al. 2014) is an instrument used to measure affectivity through self-assessment. It comprises two subscales: one is used to measure the frequency of positive, the other of negative emotions. Using a five-point Likert-type scale, the respondents indicate how often they felt a certain way during the previous months (e.g., excited, proud, afraid, upset). Cronbach's alpha coefficients are .85 (PA) and .90 (NA).

The Other as Shamer Scale, OAS (Gross et al. 1994) is an instrument that measures shame focusing on beliefs about how others evaluate or judge the self (of the respondent). The scale comprises 18 items and three subscales. The first scale is Inferiority (e.g., "I feel that other people see me as not good enough; I feel insecure about others' opinions of me"). The second subscale is Emptiness (e.g., "Others see me as empty and unfulfilled; Others think there is something missing in me"), and the third subscale is Mistakes (i.e., descriptively named "how others behave when they see me make mistakes", e.g., "I think others are able to see my defects; Other people always remember my mistakes"). Respondents answer on a five-point Likert-type scale ranging from 1 = *never* to 5 = *almost always*. The test was adapted using backtranslation. Cronbach's alpha coefficients in this study are .86 (Inferiority), .74 (Emptiness), and .79 (Mistakes). Respondents answer on a five-point Likert-type scale ranging from 1= *never* to 5 = *almost always*. Cronbach's alpha coefficients in this study are .86 (Inferiority), .74 (Emptiness), and .79 (Mistakes).

The Coping Competence Questionnaire, CCQ (Schroder & Ollis 2012), is a brief measure of resilience against helplessness and helplessness-based reactive depression. The scale contains 12 items (e.g., "I often feel unable to deal with problems; Failures can shake my self-confidence for a long time"). Respondents use 6-point Likert scales ranging from 1 = *very uncharacteristic of me* to 6 = *very characteristic of me*. Items are reversed and summed so that higher scores indicate resilience to learned helplessness (i.e., coping competence) and low scores indicate a propensity towards helplessness in stressful situations. The test was adapted using backtranslation. Cronbach's α coefficient in this study is .91.

2.4. Statistical Analyses

A Confirmatory factor analysis (CFA) was calculated using the "lavaan" package (Rosseel, 2012) within the R environment (R Core Team, 2016) to test the goodness-of-fit of the one-factor structure of the PET. The ANOVA and LSD post-hoc tests were used to assess the differences between the groups in terms of affectivity, shame, and coping competencies. Cohen's *d* was used as an effect size measure for the differences between women under and above the PET cut-off score in the examined variables. IBM SPSS Statistics for Windows, Version 24.0 was used for all analyses. A *p*-value of < .05 was considered statistically significant.

3. RESULTS

3.1. Confirmatory Factor Analysis (CFA)

A CFA was calculated to test the goodness-of-fit of the one-factor structure of the PET, considering that the instrument was used for the first time on the Serbian population. The authors considered $\chi 2/df \leq 5$, CFI ≥ .90, TLI ≥ .90, RMSEA, and SRMR ≤ .08 [44] as indicators of a good model fit. The results indicated acceptable model fit indices for the one-factor solution: $\chi 2 = 164.128$, $df = 90$, CFI = .933, TLI = .922, RMSEA = .062 (90%CI .044–.079), SRMR = .051. The CFA model showed significant beta coefficients for all 15 items of the PET (Figure 1A, Appendix).

3.2. Assessing the PET Possibility to Identify Women with Psychological Problems during the IVF Process

First, two groups of women undergoing the IVF process were distinguished based on the PET cut-off score > 30, as suggested by the test authors.

Table 1 Descriptive data on groups formed based on the PET cut-off score

	PET Categories	*n*	*M*	*SD*	*SD* error
PET score	≤ 30	79	23.89	3.87	.43
	> 30	79	39.71	5.66	.64

As seen in Table 1, the respondents were divided into two equal groups – 79 each.

Table 2 Differences in affectivity and coping competencies between the subsamples (two groups of women undergoing IVF and a group of women with at least one child conceived without difficulties)

		Sum of squares	df	Mean square	F	p
PANAS Positive Affectivity	Between Groups	17.512	2	8.756	19.743	.000
	Within Groups	125.952	284	.443		
	Total	143.464	286			
PANAS Negative Affectivity	Between Groups	42.854	2	21.427	44.070	.000
	Within Groups	138.083	284	.486		
	Total	180.937	286			
OAS Inferiority	Between Groups	21.663	2	10.832	21.936	.000
	Within Groups	139.744	284	.494		
	Total	161.408	286			
OAS Emptiness	Between Groups	20.826	2	10.413	25.495	.000
	Within Groups	115.585	284	.408		
	Total	136.411	286			
OAS Mistakes	Between Groups	8.472	2	4.236	12.787	.000
	Within Groups	93.747	284	.331		
	Total	102.219	286			
CCQ Coping competences	Between Groups	6803.898	2	3401.949	32.105	.000
	Within Groups	29987.361	284	105.962		
	Total	36791.259	286			

As seen in Table 2, there are significant differences in Affectivity, Shame in front of others, and Coping competence among the groups of respondents. A post-hoc test was conducted to determine among which groups differences can be found (Table 3).

The following differences can be seen in Table 3: Positive affectivity – respondents in the PET > 30 group have significantly lower positive scores on affectivity than those from the PET ≤ 30 group and the women not undergoing IVF; respondents with PET ≤ 30 do not differ from the women not undergoing IVF. Negative affectivity – respondents in the PET > 30 group have significantly higher scores on Negative affectivity than those in the PET ≤ 30 and Non-IVF groups; respondents with PET ≤ 30 do not significantly differ from the Non-IVF group. OAS Inferiority –respondents in the group PET > 30 have significantly higher scores than respondents in the PET ≤ 30 and Non-IVF groups; respondents in the PET ≤ 30 group have the lowest scores in Inferiority and significantly differ from both the PET > 30 and the Non-IVF group. OAS Emptiness – also, here, respondents with PET > 30 have significantly higher scores than respondents in the PET ≤ 30 and Non-IVF groups; there is no significant difference between PET ≤ 30 and Non-IVF groups. OAS Mistakes – respondents with PET > 30 have significantly higher scores than those in the PET ≤ 30 and Non-IVF groups; PET ≤ 30 and Non-IVF groups do not differ significantly. Coping competence – respondents with PET > 30 have significantly lower scores than respondents in the PET ≤ 30 and Non-IVF groups; respondents in the PET ≤ 30 group have significantly higher scores than those in the other two groups, i.e., the most pronounced coping competencies.

Table 3 Multiple comparisons – LSD post-hoc test

	Subsamples (I)	Subsamples (J)	*Mean Difference* (I-J)	*SE*	*p*	95% Confidence Interval	
						Lower Bound	Upper Bound
PANAS Positive Affectivity	PET ≤ 30	PET > 30	.62866*	.10	.000	.4201	.8372
		Non IVF	.15071	.09	.114	-.0366	.3380
	PET > 30	PET ≤ 30	-.62866*	.10	,000	-.8372	-.4201
		Non IVF	-.47795*	.09	,000	-.6652	-.2907
	Non IVF	PET ≤ 30	-.15071	.09	.114	-.3380	.0366
		PET > 30	.47795*	.09	.000	.2907	.6652
PANAS Negative Affectivity	PET ≤ 30	PET > 30	-.91041*	.11	.000	-1.1288	-.6920
		Non IVF	-.07781	.10	.435	-.2739	.1183
	PET > 30	PET ≤ 30	.91041*	.11	.000	.6920	1.1288
		Non IVF	.83260*	.10	.000	.6365	1.0287
	Non IVF	PET ≤ 30	.07781	.10	,435	-.1183	.2739
		PET > 30	-.83260*	.10	,000	-1.0287	-.6365
OAS Inferiority	PET ≤ 30	PET > 30	-.72059*	.11	.000	-.9414	-.4998
		Non IVF	-.22796*	.10	.024	-.4264	-.0296
	PET > 30	PET ≤ 30	.72059*	.11	.000	.4998	.9414
		Non IVF	.49263*	.10	.000	.2950	.6902
	Non IVF	PET ≤ 30	.22796*	.10	.024	.0296	.4264
		PET > 30	-.49263*	.10	.000	-.6902	-.2950
OAS Emptiness	PET ≤ 30	PET > 30	-.61607*	.10	.000	-.8169	-.4153
		Non IVF	-.02065	.09	.822	-.2011	.1598
	PET > 30	PET ≤ 30	.61607*	.10	.000	.4153	.8169
		Non IVF	.59543*	.09	.000	.4157	.7751
	Non IVF	PET ≤ 30	.02065	.09	.822	-.1598	.2011
		PET > 30	-.59543*	.09	.000	-.7751	-.4157
OAS Mistakes	PET ≤ 30	PET > 30	-.44477*	.09	.000	-.6256	-.2639
		Non IVF	-.12383	.08	.135	-.2863	.0387
	PET > 30	PET≤ 30	.44477*	.09	.000	.2639	.6256
		Non IVF	.32094*	.08	.000	.1591	.4828
	Non IVF	PET ≤ 30	.12383	.08	.135	-.0387	.2863
		PET > 30	-.32094*	.08	.000	-.4828	-.1591
CCQ Coping competences	PET ≤ 30	PET > 30	13.05372*	1.64	.000	9.8195	16.2880
		Non IVF	5.20548*	1.47	.000	2.3107	8.1002
	PET > 30	PET ≤ 30	-13.05372*	1.64	.000	-16.2880	-9.8195
		Non IVF	-7.84824*	1.48	.000	-10.7545	-4.9420
	Non IVF	PET ≤ 30	-5.20548*	1.47	.000	-8.1002	-2.3107
		PET > 30	7.84824*	1.48	.000	4.9420	10.7545

Note. * the mean difference is significant at the .05 level.

Cohen's *d* was calculated to estimate effect size values for the examined differences in affectivity, shame, and coping competencies between women undergoing IVF with PET ≤ 30 and PET > 30. The results indicated medium to large effect size values, i.e., $d = .88$ for Positive Affectivity, 1.45 for Negative Affectivity, .98 for OAS Inferiority, .91 for OAS Emptiness, .73 for OAS Mistakes, and 1.26 for Coping competencies. Values of *M, SD, t*-statistic, and *p* are shown in Table A1 in the Appendix.

4. DISCUSSION

In this research, we wanted to examine the possibility of using the PET (Franco et al. 2002) to identify women with psychological problems during the IVF process. In other words, we wanted to check if it was possible to use PET scores to detect differences in affectivity, shame and coping competencies as indicators of psychological problems during IVF.

First, a CFA for PET was performed and the results revealed acceptable model fit indices for the one-factor solution.

4.1. Respondents with PET scores > 30

This group of women reported more intensive problems related to fertility, which they faced in everyday life. At the same time, these are women who, according to the authors of the test, need psychological support (Franco et al., 2002). The first hypothesis is related to examining differences between this group of women with PET scores ≤ 30 and women who gave birth to at least one child without conception difficulties. As seen in Table 2, we confirmed our expectations: respondents with PET scores > 30 have indeed lower scores on Positive affectivity, higher scores on Negative affectivity, higher scores on all three subscales of the Other as Shamer scale, and significantly lower scores on Coping competence than the other two groups. These results are consistent with those of previous studies. According to the results, it seems that differences in psychological reactions to IVF indeed exist (An et al. 2012; Rockliff et al. 2014; Verhaak et al. 2005). Some women in the IVF process more often than others face increased negative and decreased positive emotionality, as well as shame and the feeling of inadequacy (Cunha et al. 2016; Benyamini et al. 2009; Woods at al. 1991). There are complex reasons for these negative emotions; however, some of them can probably be related to lower coping competencies (Gourounti et al. 2012; Schmidt 2005; Terry & Hynes 1998) – which is also indicated by the results of our study. We find this result significant from the aspect of counseling, as it indicates the importance of developing functional coping mechanisms in a specific situation such as IVF.

4.2. Respondents with PET scores ≤ 30

This group of respondents comprises women who, according to the test results, do not believe that their coping with infertility causes significant problems in their everyday life. This group, along with the group of women who are mothers of at least one child conceived without difficulties, is very important for answering the main research question – is it possible to identify women with psychological problems during the IVF process based on PET scores, i.e., is it possible to recognize women who need psychological support? Differences were expected between respondents with high and low scores relative to other variables in the study considering how the groups are formed. Still, that does not mean that this group of women does not need psychological counseling at all. However, if the PET cut-off score > 30 is a good cut-off line, these respondents will not differ from women who are the mother of at least one child conceived without difficulties. We expected differences (only) regarding coping competencies, which should be expressed more in the group of women with PET scores ≤ 30, which supports the claim as to the importance of coping skills. The second hypothesis of the study was also confirmed: respondents with low PET scores have the highest coping competencies, and they do not significantly differ from the Non-IVF group regarding Positive and Negative Affectivity or Emptiness and Mistakes subscales of the OAS. There is, however,

an unexpected significant difference: women involved in the IVF process with PET scores ≤ 30 also have the lowest Inferiority in the sample. Although it was not hypothesized, the finding is not surprising. Some studies indicate that lower self-esteem is one of the symptoms of higher psychological distress in women that undergo infertility treatment when compared to men (El Kissi et al. 2013), i.e., the emotional state of women with infertility can be improved by psychotherapy due to, among other things, an increase in self-esteem (Terzioğlu & Özkan 2017). Self-esteem is a continuum where the zone of lower values is, in fact, inferiority. Therefore, besides high coping competencies, a protective factor and the strength of women without significant problems during the IVF process is also their self-esteem i.e., the absence of feelings of inferiority.

4.3. The effect size of significant differences between subsamples with PET scores > 30 and ≤ 30

As an addition to the analysis of differences between the subsamples, the effect size of significant differences in affectivity, shame, and coping competencies in women undergoing the IVF process was also computed. All but one of the effects fall into large effect size; medium effect size was found for the Mistakes subscale. These results also speak in favor of the possibility of using PET scores to identify women with psychological problems. The biggest differences were found between the scores on Negative Affectivity and Coping Competences - this relationship has already been discussed: lower coping competencies are one of the important sources of negative emotions and should be given special attention during psychological counseling.

5. Conclusions and Implications of the Findings

We believe that the results support the claim that scores on the PET scale (cut-off score > 30) can be considered for inclusion in the process of identifying women with significant psychological difficulties, i.e., that reaching these scores can be regarded as an indicator of the need for psychological support during the IVF process. Women with PET scores ≤ 30 manage to adjust to the challenges of the IVF process and, if they do not decide to ask for support, it is not necessary to include them in psychological counseling. Policy-makers can find these results relevant for two reasons: first, there are women who need psychological support as an integral part of the IVF treatment, i.e., the costs of the treatment, regardless of whether covered by the state or individually, should include psychological counseling as well; an infertility team should also include a mental health practitioner, who would pay attention to this group of women. Second, if there is concern regarding the amount of work (and costs), certain predictions can be drawn from the obtained results: counseling is needed, and we may say it is necessary for approximately half of the women undergoing IVF treatment.

5.1. Limitations of the Study

Limitations of the study stem partly from the size of the sample – 158 respondents in total in the IVF group, yet this number was halved after splitting the sample into groups. Although this sample, statistically speaking, is not small, the results need to be confirmed on a larger sample and samples from other countries. In order to obtain a more comprehensive picture of the psychological status of women undergoing IVF treatment, the following studies should

include other indicators of psychological status, as well as variables that can indicate the source of differences (e.g., satisfaction with life in general and satisfaction with specific life domains such as family, work, friendships, and leisure).

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APPENDIX

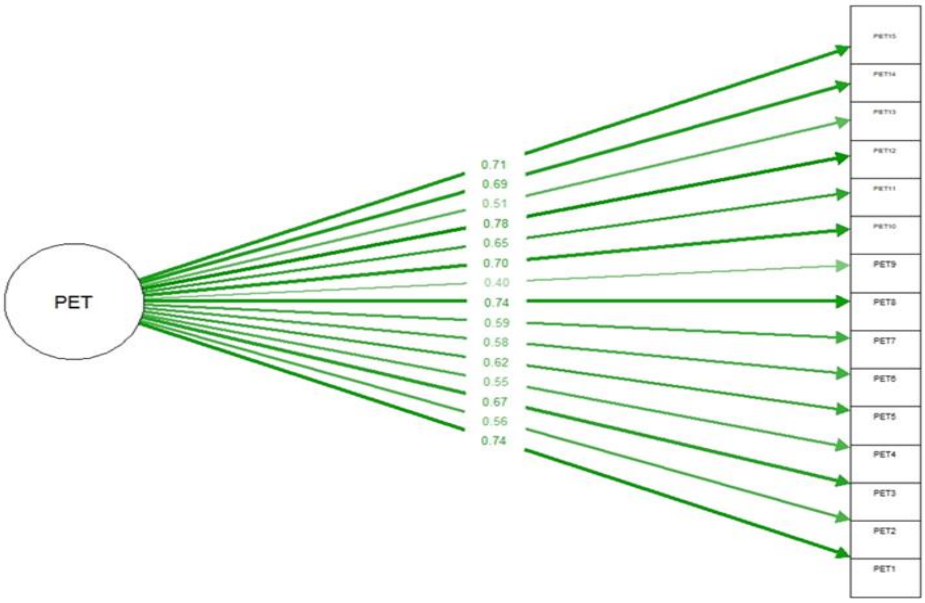

Fig. A1 A one-factor CFA model of PET

Table A1 Cohen's d effect size for the examined differences in affectivity, shame, and coping competencies between women undergoing IVF with PET ≤ 30 and PET > 30

Variable	Subsample	M	SD	t	p	d
PANAS Positive Affectivity	PET ≤ 30	3.80	.63	5.526	.000	.88
	PET > 30	3.17	.79			
PANAS Negative Affectivity	PET ≤ 30	2.14	.52	-9.139	.000	1.45
	PET > 30	3.05	.73			
OAS Inferiority	PET ≤ 30	1.93	.60	-6.141	.000	.98
	PET > 30	2.65	.85			
OAS Emptiness	PET ≤ 30	1.58	.54	-5.672	.000	.91
	PET > 30	2.20	.79			
OAS Mistakes	PET ≤ 30	1.86	.51	-4.604	.000	.73
	PET > 30	2.31	.69			
CCQ Coping comp.	PET ≤ 30	4.65	.80	-7.945	.000	1.26
	PET > 30	3.56	.91			

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IDENTIFIKOVANJE ŽENA SA PSIHOLOŠKIM PROBLEMIMA TOKOM PROCESA VANTELESNE OPLODNJE: TEST PSIHOLOŠKE EVALUACIJE (PET)

Posebno snažne ili neadekvatne emocionalne rekacije tokom procesa vantelesne oplodnje mogu imati efekte i na uspeh tretmana i na kasnije mentalno zdravlje. U ovom istraživanju proverena je mogućnost Testa psihološke evaluacije za neplodne parove (Psychological Evaluation Test for Infertile Couples – PET) da izdvoji žene koje imaju psihološke probleme tokom VTO procesa, kako bi im bilo ponuđeno psihološko savetovanje. Uzorak čini 158 ispitanica uključenih u VTO proces u vreme sprovođenja istraživanja i 128 ispitanica koje imaju bar jedno dete začeto bez teškoća. Sve ispitanice su popunile upitnike koji se odnose na emocionalni status i koping kompetencije, dok je PET zadat samo ženama uključenim u VTO proces. Ispitanice sa višim PET skorovima (> 30) imaju značajno viši Negativni afektivitet i Stid od drugih, a niži Pozitivni afektivitet i koping kompetencije od grupe sa nižim PET skorovima (≤ 30) i grupe žena koje su začele bez teškoća. Ispitanice sa nižim PET skorovima se ne razlikuju značajno od grupe žena koje su začele bez teškoća. Dobijeni rezultati pokazuju da se PET cut-off skor > 30 može smatrati pouzdanom merom za identifikovanje žena koje imaju psihološke probleme, odnosno skorovi > 30 mogu biti uzeti kao indikator potrebe za psihološkom podrškom.

Ključne reči: *psihološka evaluacija, VTO, afektivitet, prevladavanje, psihološka podrška*.