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Self-esteem and psychological distress among involuntary childless couples: Moderating roles of coping strategies

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ABSTRACT

The inverse relationship between self-esteem and psychological distress among couple with involuntary childlessness had been documented. Yet the moderating role of coping strategies in this relationship have received little attention. This study investigated the moderating roles of coping strategies on the relationship between self-esteem and psychological distress among Nigerian couples with involuntary childlessness. Participants comprised one hundred and fifty-two (152) married men and women (males = 64 and female = 88, Mean age: 41.32, *SD*: 6.38 years) drawn from South-East Nigeria. They completed measures of psychological distress, self-esteem scale and coping strategies. Result of moderated regression analysis showed that emotion focused coping was a significant predictor of psychological distress. The result also showed that emotion focussed coping moderated the relationship between self-esteem and psychological distress such that psychological distress was lower for high self-esteem individuals who adopted lower emotion focussed coping compared to individuals with low-self-esteem who adopted low emotion focussed coping. Whereas problem focused coping was not a moderator between self-esteem and psychological distress. The findings in this study underscore the importance of de-emphasizing greater use of emotion focussed coping as this may result in higher psychological distress among couple with the challenge of involuntary childlessness.

The prevalence of involuntary childlessness is high worldwide (Mascarenhas, Flaxman, Boerma, Vanderpoel, & Stevens, 2012) including both developed and developing countries (Tabong & Adongo, 2013; Pedro & Mwaba, 2013). In Nigeria particularly, the incidence of infertility is between 20% and 30% (Asemota & Klatsky, 2015). In many parts of the world, getting married and expectation of parenthood or having children is extremely valued and considered a natural part of adult life. The benefits of children as people presume are thus closely linked with core psychological needs for connectedness, security and control (e.g., reliable support in old age), and experiencing a positive self, and is associated with subjective well-being (Angner, 2005). Thus, young adults anticipate the prospect of becoming biological mothers and fathers (Joshi, Singh, & Bindu, 2009) particularly in African culture.

In line with most of the cultures in African countries, children do not only serve as a source of caregivers in old age but are also perceived as a means of continuation of the lineage of an individual (Horbst, 2010). Thus, inability to have children creates enormous pain and psychological distress among couples. In African culture, involuntary childless couples may be despised, stigmatised, neglected and abused by friends, parents and in-laws who are deeply disappointed for loss of family name in the community (Odiete et al., 2016) and these are more experienced by women who are commonly blamed for the cause of infertility (Lord & Robertson, 2005). Research have shown that involuntary childlessness has been associated with increased psychological distress, emotional pain and grief (Al-Asadi & Hussein 2015; Gourounti, Lykeridou, & Vaslamatzis, 2012; Hajela Prasad, Kumaran, & Kumar, 2016).

Psychological distress (PD) denotes a state of emotional suffering that are characterized by symptoms of depression (e.g., lost interest; sadness; hopelessness) and anxiety (e.g., restlessness; feeling tense) (Mirowsky & Ross, 2002). Studies on PD among couples with involuntary childlessness have found that the diagnosis of infertility may result in some negative emotions such as depression and anxiety (Al-Asadi & Hussein, 2015; Gourounti et al., 2012). This may be more critical in settings where fertility is highly valued (Van Balen & Boss 2009; Chimbatata et al., 2016). Infertility is a low-control stressor: a stressful condition in which the couple with infertility problem can do little or nothing to influence the nature or the outcome of their situation (Terry & Hynes, 1998) and this can increase their emotional turmoil. Consequently, assessment of psychological distress among involuntary childless couples and the exploring some positive psychological factors such self-esteem are thus important for prevention and intervention purposes for the vulnerable population.

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Self-esteem is an important factor that could mitigate against the stress associated with the experience of involuntary childlessness. Higher self-esteem can lead to a better psychological health and social behaviours whereas low self-esteem is associated with a broad range of social and mental health problems (Cizmeli, Lobel, Franasiak, & Pastore, 2013) including PD resulting from the experience of involuntary childlessness. Previous evidence has shown that infertility has a negative impact on involuntary childless couple's self-esteem (Sultan & Tahir, 2011) and that infertility is linked to lower self-esteem among women (El Kissi et al., 2013) and men (Basar et al., 2017; Anderson, Sharpe, Rattray, & Irvine, 3003). It is therefore unsurprising that lower self-esteem will be associated with higher PD among involuntary childless couple. In a study, assessing the Levels and associations among self-esteem, fertility distress, coping, and reaction to potentially being a genetic carrier in women with diminished ovarian reserve, Cizmeli, et al. (2013) found that self-esteem was a significant, inverse predictor of fertility distress, indicating that higher self-esteem could reduce psychological distress associate with infertility. Other studies (Dunkel-Schetter & Lobel, 1991) showed noted that higher self-esteem was a significant predictor of reduced fertility distress.

Although this perspective clearly represents the prevailing view in the literature, a small but significant researcher have suggested that the relationship between self-esteem and psychological distress may be more complex and that there may be a curvilinear relationship between these constructs (Block & Thomas, 1995; Harder, 1984; Robson, 1998). Thus, the relationship between self-esteem and PD seems to be better explained by individual coping strategies. In order word, the extent to which self-esteem impact on PD could depend on an individual's coping skill. Moreover, researchers (Edelmann et al., 1994) have suggested that coping may serve as a buffer or mediator for psychological distress. Thus, this study sought to find out if coping strategies could moderate the relationship between self-esteem and PD.

Coping is defined as a cognitive and behavioural efforts to master, reduce, or tolerate the internal and/or external demands appraised by individual as stressful (Lazarus & Folkman 1984). When faced with the challenges of a stressful event, individuals will engage in multiple coping strategies, often practiced simultaneously until stress is reduced. In coping theories, two major ways of coping strategies that have being the focus of many researches are - problem focused (PFC) and emotion focussed coping (EFC) (Doron et al., 2011; Folkman & Lazarus, 1988; Lazarus & Folkman, 1984). PCF deals with acting directly on the stressors in order to reduce the PD (Lazarus & Folkman, 1984; Lykeridou et al., 2010) such as seeking practical or informational support and confronting the stressful situation. In contrast, EFC (such as such as passive and active avoidance, escaping, and positively reappraising the stressor) is aimed at regulating stressful emotions (Lykeridou et al., 2010) and involves actions intended to help the individual alleviate PD and minimize negative affect (Heckhausen & Schulz, 1995).

Lykeridou et al. (2010) suggest that variables such as coping skills may be considered as factors in emotional stress as well as risks or protective factors that can be used to explain individual differences in infertility related psychological distress. It has been suggested that EFC coping may lead to prolonged distress among involuntary childless couples. For instance, in a study conducted among 816 participants who did not achieve a delivery after 12 months of fertility treatment, Schmidt, Holstein, Christensen and Boivin (2005) found that active avoidance/denial coping predicted high fertility problem stress. Similarly, EFC was a predictor of poor adjustment to infertility (Terry & Hynes, 1998) and of increase distress after one treatment attempt (Litt, Tennen, Affleck, & Klock, 1992 Berghuis & Stanton 2002). On the other hand, PFC strategies have been linked to better adjustment and low distress. For instance, longitudinal studies among couple and women in IVF treatment (Hynes, Callan, Terry, & Gallois, 1992; Litt, et al., 1992; Schmidt et al., 2005) have shown that PFC strategies predicted better adjustment and low distress. Other researchers have supported the positive association of EFC strategies with PD as well as the inverse relationship of PFC with PD. For instance, in a study investigating the predictors of PD in patients starting IVF treatment, Van den Broeck, D'Hooghe, Enzlin, and Demyttenaere, (2010) found that active coping (PFC) was a negative predictor of PD whereas passive coping (EFC) was positive predictor of PD. On the contrary, Verhaak (2003) found no relationship between PFC and PD. Furthermore, Lazarus and Folkman (1984) suggest that the effectiveness of a coping style cannot be determined in a straightforward way as is often suggested. It therefore suggests that both forms of coping are often necessary for individual to move on from a stressful event or situation depending on the nature of their problems and that individual could use multiple forms of coping in dealing with psychological problems.

To our knowledge, the moderating role of coping strategy in self-esteem-psychological distress relationship has not been given much attention especially in a Sub-Saharan African sample. Hence, in line with two major coping theoretical conception in literature, the present study is aimed at exploring the complex relationship between self-esteem, PFC, EFC and PD among Nigerian couples with involuntary childlessness.

It is hypothesized that:

1. Self-esteem would have a significant negative association with PD.
2. EFC would have a significant positive relationship with PD.
3. PFC will have a significant negative relationship with PD.
4. EFC would significantly moderate the relationship between self-esteem and PD such that PD will be lower for high self-esteem individuals with low EFC.

5. PFC will significantly moderate the relationship between self-esteem and PD such that PD will be lower for high self-esteem individuals with higher PFC.

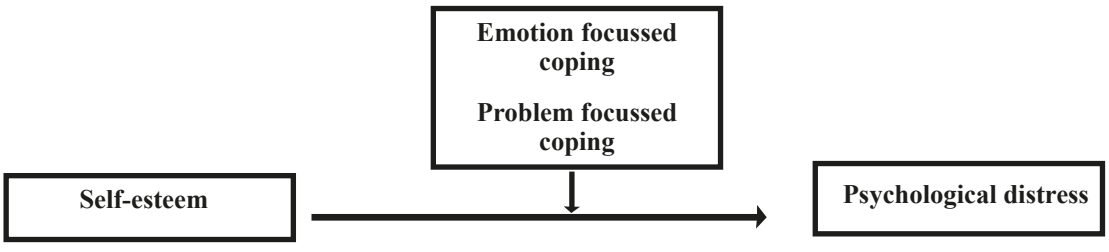

Figure 1: Moderation model- Emotion focused coping and problem focussed coping as moderators in the relationship between self-esteem and psychological distress

Method

Participants

Participants in this study were recruited from a fertility clinic in a hospital in South East Nigeria. They comprised one hundred and fifty-two (152) married men and women (64 males and 88 females) with involuntary childlessness. They were aged between 24 to 57years with a mean age of 41.31. Only participants who could understand English were involved in the study. Their educational status was as follows: primary education- 24 (15.8%), secondary education- 68 (44.8%), and tertiary education 60 (39.5%). Regarding their occupation, eighty-eight (88) (57.9%) reported being self-employed, forty (40) (26.3%) were civil servants while 24 (15.8%) were craft or skilled workers.

Instruments

Rosenberg's (1965) Self-esteem Scale (RSES)

The RSES is a unidimensional measure of global self-esteem and comprise 10 statements showing overall feelings of self-worth or self- acceptance. The RSES are scored on a four-point likert scale ranging from 1= strongly agree to 4=strongly disagree. Five of the items are scored in reversed directions. Scores ranges from 0 to 30 with higher scores indicating higher self-esteem. The Cronbach α coefficients of internal consistency as provided by Rosenberg (1965) was .78 for English version. For the present study a Cronbach α of .88 was obtained.

Kessler Psychological Distress Scale (K10, Kessler, 1997)

The K10 Psychological Distress Scale is a 10-item scale that assesses the frequency of non-specific psychological distress symptoms during the previous month. Items were rated on a five-point ordinal scale ranging from all of the time (score 4) to none of the time (score 0). The total score for each respondent was calculated by summing all 10 items. The scores range from 0 to 40, with higher scores indicating higher levels of psychological distress. The reliability tests using the 2000 Collaborative Health and Wellbeing Survey (Dal Grande, Taylor, & Wilson, 2002) ranged from .42 to .74 indicating that K10 is a moderately reliable instrument. For the present study, we obtained a Cronbach's α of .81.

Brief COPE (Carver, 1997)

The brief COPE Scale is a 28-item self-report measure of a number of different coping behaviours and thoughts a person may have in response to a specific stressful situation. It consists of 14 sub-scales: self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive reframing, planning, humour, acceptance, religion, and self-blame. Each of these subscales is classified broadly into two major types of coping that has been identified in literature: Problem focused coping and emotion focused coping. Active coping, use of instrumental support, planning, and acceptance are considered problem focused coping while self-distraction, denial, substance use, use of emotional support, behavioural disengagement, venting, positive reframing, humour, religion, and self-blame are considered emotion focused coping (Doron et al., 2011). Items 2, 7, 10, 14, 20, 23, 24, and 25 were classified as problem-based coping and the rest of the items fell into emotion-based coping. Items ranges from 1 (I haven't been doing this at all) to 4 (I've been doing this a lot). Internal reliabilities for the 14 subscales range from .57 to .90 (Carver, 1997). When used with student sample, Doron et al., (2011) found the Cronbach's alphas to be .60 for problem focused coping and .75 for emotion-focused coping. The internal consistency obtained by (Onyedibe et al. 2015) with undergraduate sample are .73 for the entire scale while the reliability coefficient for the two factors are .65 for problem focused coping and .65 for emotional focused coping.

Procedures

This study was approved by the ethical committee of the hospital in which the study was conducted. Participants volunteered to participate in the study and signed an informed consent form. The questionnaires were organized in a composite form with section A consisting of demographic information including gender, age, level of education and occupation; while section B comprised the three instruments for the study. Two research assistants trained in the method of data collection together with the principal researcher helped in the data collection. One hundred and sixty (160) questionnaires were administered to the volunteered participants within the period of one-week workshop. Each couple was given two questionnaires and was asked to fill it individually. However, there were some women who did not come with their husbands, either because their husband travelled or were not available at the time of the workshop. They could fill the questionnaires at their own convenience but within the workshop period. One hundred and fifty-six questionnaires (156) were later collected which is 97.5 return rates. Four (4) questionnaires were discarded due to incomplete response set while one hundred and fifty-two (152) questionnaires were used for data analysis.

Design/Statistics

The design of this study is cross-sectional design. Statistics was conducted with the SPSS version 25. Specifically, the data analysis used was the moderated regression analysis through PROCESS procedures for SPSS Version 3.2 (Hayes, 2018). The analysis was conducted separately for problem focussed coping and emotion focussed coping. In the analysis, psychological distress was entered in the column Y (for outcome variable), self-esteem was inputted into the column X (for independent variable) whereas problem or emotion focussed coping was keyed into the column W (for moderator variable) independently. The demographic variables (age, gender, education, occupation) served as control variables and were entered in the column identified as covariates in the model.

Results

The result in table one showed that among all the demographic variables, only occupation had a negative and significant relationship with psychological distress (r = -.20; p< .05). EFC was significantly and positively related to PD (r=.39; p<.01). Problem focused coping and self-esteem were not significantly related to PD.

Figure 3 showed the simple slope for self-esteem predicting PD at each level of EFC. For low EFC, self-esteem significantly predicted PD. The slope showed that for involuntary childless couples with low EFC, high self-esteem significantly predicted reduced PD. On the other hand, PD was higher for individuals with higher EFC strategies.

For demographic variables, the result in table two showed that age (B = -.17, t = -2.12, p < .05) and occupation (B = -2.48, t = -3.19, p < .01) significantly predicted PD. For the main predictors, EFC was a significant positive predictor of PD (B = .38, t = 6.29, p < .001) indicating the greater the use of EFC, the higher the psychological distress. However, self-esteem was not a significant predictor of PD. The interaction between self-esteem and emotion focused coping was significant (B = .04, t = 3.56, p < .001) indicating a moderating effect of emotion focussed coping on the relationship between self-esteem and psychological distress

Table 1: Correlations of the variables and descriptive statistics

Factors	*M*	*SD*	1	2	3	4	5	6	7	8
1 PSYD	23.55	6.83	-	-.15	-.04	-.03	-.20*	.01	.39**	-.03
2 Age	41.32	7.81		-	-.31**	-.04	-.10	.33**	.15	.07
3 Gender	1.58	.50			-	.32**	.09	-.13	-.05	-.07
4 Education	3.13	.87				-	.58**	.30**	.15	.48**
5 Occupation	1.58	.75					-	.14	-.07	.32**
6 Prob FC	17.80	3.1						-	.44**	.17*
7 Emo FC	52.61	8.61							-	.20*
8 Self-Esteem	30.36	3.93								-

Note. *p < .05, **p < .01. Prob FC = Problem focused coping, Emo FC = Emotion focused coping, PSYD = Psychological Distress

Table 2: Predicting psychological distress under emotion focused coping as a moderator

Variables	*B*	*SE*	*t*	*LLCI*	*ULCI*
Controls					
Age	-.17	.07	-2.47**	*-.30*	*-.03*
Gender	-2.13	1.12	-1.90	-4.35	.08
Education	1.65	.84	1.97	-.01	3.30
Occupation	-2.48	.82	-3.03**	*-4.09*	*-.86*
Main Predictors					
Self-esteem	-.04	.15	-.29	*-.33*	*.25*
Emotion FC	.39	.06	6.29***	*.26*	*.51*
Interaction Effects					
SE X Emotion FC	.04	.01	3.56***	*.02*	*.07*
Model Summary					
R	.55				
R^2	.30				
F	8.84***				

Note: *p<.05; ** p <.01; *** p< .001; Emotion FC = Emotion focused coping; SE = Self-esteem

Table 3: Conditional effects self-esteem on psychological distress

Emotion focused coping	*B*	*p*	95% *CI*	
			LLCI	*ULCI*
One *SD* below mean	-.440	.009	-.769	-.111
Mean	-.026	.861	-.319	.267
One *SD* above mean	.322	.101	-.064	.708

As shown in table three, self-esteem was significantly related to PD when EFC was one standard deviation below the mean, but not when EFC was at the mean or above the mean.

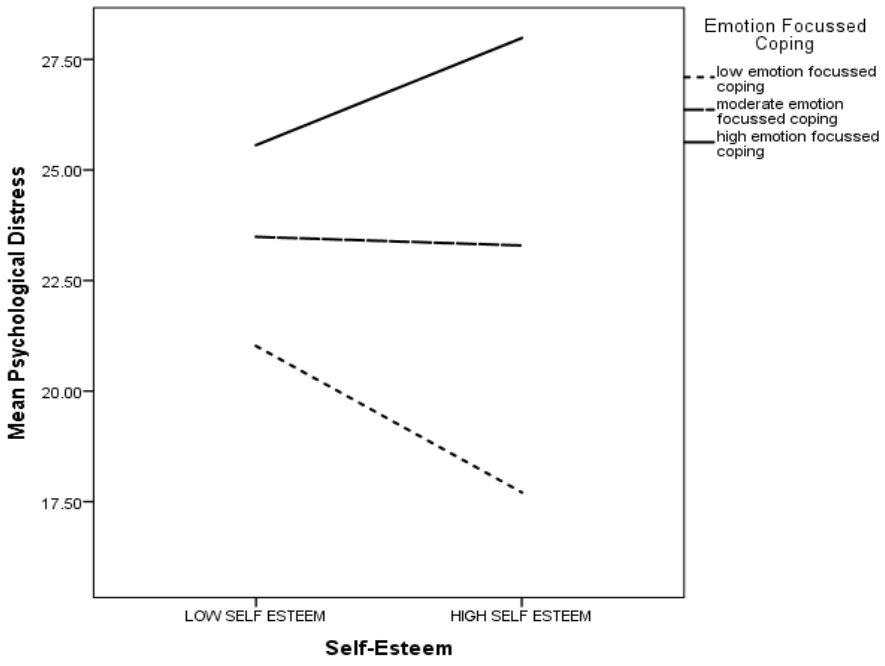

Figure 3: Simple slope showing moderating role of emotion-focused coping in the relationship between self-esteem and psychological distress

Table 4: Predicting psychological distress under problem focused coping as a moderator

Variables	*B*	*SE*	*t*	*LLCI*	*ULCI*
Controls					
Age	-.19	.08	-2.39*	-.34	-.03
Gender	-2.34	1.30	-1.80	-4.92	.23
Education	1.99	1.01	1.97	-.00	3.98
Occupation	-3.07	.98	-3.42**	-4.85	-1.29
Main Predictors					
Self-esteem	-.*04*	*.15*	-.*29*	-.33	.31
Problem FC	*.19*	*.20*	*.94*	-.21	.58
Interaction Effects					
SE X Problem FC	.06	.04	1.74	.01	.13
Model summary					
R	.34				
R²	.12				
F	2.70*				

Note. $^{*}p<.05$; $^{**}p<.01$; $^{***}p<.001$; Problem FC = Problem focused coping; SE= Self-esteem

The result in table four showed that for the demographic variables, only age (B = -.19, t = -2.39, p < .018) and occupation (B = -3.07, t = -3.42, p < .001) were significant predictors of PD. For the main predictors, PFC (B = .19, t = .94, p = .35) and self-esteem (B = -.01, t = -.06, p = .95) were not significant predictors of psychological distress. Similarly, the interaction between problem focussed and self-esteem (B = .06, t = 1.74, p = .08) on psychological distress was not significant.

Discussion

This study examined the moderating role of EFC and PFC on the relationship between self-esteem and PD among involuntary childless couples. As hypothesised, greater use of EFC was associated with increased distress among childless couples. This finding is consistent with previous research (Litt et al., 1992; Berghuis & Stanton., 2002; Schmidt et al., 2005; Van den Broeck et al., 2010) indicating that EFC strategies are associated with poor physical and psychological health. In line with the major aim of this study, we found that EFC moderated the relationship between self-esteem and PD. This means that the association between self-esteem and PD depends on an individual's EFC strategies. As depicted in figure 1, for individuals with low EFC strategies, self-esteem had inverse relationship with PD suggesting that individuals with high self-esteem who used low EFC strategies had significant lower PD compared to individual with lower self-esteem who adopted low EFC.

On the other hand, greater use of EFC even with higher self-esteem resulted in higher PD. Although a number of studies have linked higher self-esteem and low PD (Cizmeli et al., 2013; Dunkel-Schetter & Lobel., 1991), higher EFC strategies to higher infertility related distress (Litt et al., 1992; Berghuis & Stanton., 2002; Schmidt., et al., 2005; Van den Broeck et al., 2010), none of this studies have investigated EFC as a moderator in this unique relationships. Our study thus brings to the fore this complex relationship among self-esteem, EFC and PD particularly among involuntary childless couple. PFC strategies were not significantly associated with PD among involuntary childless couples. Contrary to previous research (Hyness et al., 1992; Terry & Hynes., 1998; Schmidt et al., 2005; Van den Broeck et al., 2010) which found that PFC was associated with high level of well-being among infertile women, other researchers (Lykeridou et al., 2011) found that PFC increased PD. Our result seems to favour some other studies (Verhaak, 2003) that found no significant association between PFC and PD.

Although surprisingly, we found that self-esteem was not significantly related to PD, it however had a negative relationship with PD under both emotion and problem focussed strategies. This showed that as self-esteem increases, PD decreases. This is not in consistent with other studies (Cizmeli et al., 2013) which found a significant relationship between self-esteem and PD among infertile couples. The non-significant relationship in our sample may stem from the participants response with social desirability that are common among persons with infertility related problems. The participants may find it difficult to disclose their negative evaluation of self as a result of societal and cultural stigmatization.

This study has all the limitations of a cross sectional research, utilization of self-report measures, and purposive sampling technique etc. The population of the study also lacked diversity, as it comprised primarily of married couple drawn from one geopolitical zone in Nigeria: South Eastern Nigeria. Such homogeneity may limit generalizability of the findings. With longitudinal study design, use of random sampling technique and involving diverse clinical and community samples, we will be better qualified to substantiate and expand the findings.

Despite these limitations, findings from this study have important implications for psychological management of couples with infertility related problems. The results from this study revealed that the use of emotion focussed coping results in considerable level of distress and that self-esteem is inversely related to psychological distress among involuntary childless couples who use low emotion focussed strategies. We recommend that professional help from psychologists and other healthcare providers is urgently necessary for childless couples during their infertility treatments in hospitals or clinics in order to help them learn to manage appropriately their involuntary childlessness and enjoy better quality of life. Evidence has shown that psychosocial interventions have the potential to be effective in decreasing distress and psychiatric morbidity if they are directed on education and learning skills (Boivin, 2003). By making psychological interventions available to these couples facing the challenge of involuntary childlessness, and by letting them learn how to cope actively with their childlessness, the negative consequences of their childlessness may be decreased.

Conclusion

We conclude from this study that EFC moderated the relationship between self-esteem and PD such that higher self-esteem individuals who adopted low EFC had significant lower PD. There is need to de-emphasize the use of EFC since such coping strategies have been found to be detrimental to couples experiencing the challenge of involuntary childlessness. In addition, self-esteem have been shown to reduce the rate of psychological distress experienced by the couples with infertility problems. We suggest that psychologist as well as other health professional should pay greater attention to the psychological distress these vulnerable individuals experience in order to

enhance their health-related quality of life while attending their infertility treatment.

Conflict of Interest

The authors declare that they have no conflict of interest. All authors agreed to the content of the statement.

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References

Al-Asadi, J. N., & Hussein, Z. B. (2015). Depression among infertile women in Basrah, Iraq: Prevalence and risk factors. *Journal of the Chinese Medical Association, 78,* 673-677.

Anderson, K. M., Sharpe, M., Rattray, A., Irvine, D. S. (2003). Distress and concerns in couples referred to a specialist infertility clinic. *Journal of Psychosomatic Research, 54,* 353–355.

Angner, E. (2005). *Subjective measures of well-being. A philosophical examination*. Dissertation, University of Pittsburg.

Asemota, O. A., & Klatsky, P. (2015). Access to Infertility Care in the Developing World: The Family Promotion Gap. *Seminars in Reproductive Medicine, 33,* 17-22. doi.: 10.1055/s-0034-1395274

Basar, M. M., Kendirci, M., Alkan, E., Semiz, A., Sirin, H., & Balbay, D. (2017). Male infertility is a risk for depression and low self-esteem: Prospective, case-control, clinical study. *European Urology Supplements, 16(3),* e1017–e1018. doi: 10.1016/s1569-9056(17)30642-5

Berghuis, J. P and Stanton, A. L., (2002). Adjustment to a dyadic stressor: a longitudinal study of coping and depressive symptoms in infertile couples over an insemination attempt. *Journal of Consultant Clinical Psychology 70,* 433–438.

Block, J., & Thomas, H. (1995). Is satisfaction with self a measure of adjustment*? Journal of Abnormal Psychology, 51,* 254-261.

Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the Brief COPE. *International Journal of Behavioral Medicine, 4,* 92–100.

Chimbatata, N. B. W. & Malimba, C. (2016). Infertility in Sub-Saharan Africa: a woman's issue for how long? A qualitative review of literature. *Open Journal of Social Sciences, 4,* 96-102. doi.: 10.4236/jss.2016.48012

Cizmeli, C., Lobel, M., Franasiak, J., & Pastore, L. M. (2013). Levels and associations among self-esteem, fertility distress, coping, and reaction to potentially being a genetic carrier in women with diminished ovarian reserve. *Fertility Sterility, 99*(7), 2037–44. e3. doi: 10.1016/j.fertnstert.2013.02.033

Dal Grande, E., Taylor, A., & Wilson, D. (2002). *South Australian Health and Wellbeing Survey*. Adelaide: South Australian Department of Human Services. Retrieved from https://www.researchgate.net/profile/Anne_Taylor8/publication/254442590_South_Austr alian_Health_Wellbeing_Survey/links/0f31753b0ad8926a7d000000.pdf

DoronJ., Stephan, Y., Maiano, C & Le-Scanff, C. (2011). Motivational predictors of coping with academic examination. *Journal of Social Psychology, 151*(1), 87–104

Dunkel-Schetter, C., & Lobel, M. (1991). Psychological reactions to infertility. In A. Stanton and C. Dunkel-Schetter (Eds.), *Infertility: Perspectives from stress and coping research*. Plenum Press; New York: 1991. pp. 27–57

Edelmann, R. J., Connolly, K. J., & Bartlett, H. (1994). Coping strategies and psychological adjustment of couples presenting for IVF. *Journal of Psychosomatic Research, 38*, 355 – 364.

El Kissi, Y., Romdhane, A. B., Hidar, S., Bannour, S., Ayoubi Idrissi, K., Khairi, H., & Ben Hadj Ali, B. (2013). General psychopathology, anxiety, depression and self-esteem in couples undergoing infertility treatment: a comparative study between men and women. *European Journal of Obstetric Gynaecology Reproduction Biology, 167*, 185–189.

Folkman, S. & Lazarus, R. S (1988). Coping as a mediator of emotions. *Journal of Personnel and Social Psychology, 54,* 466–475.

Folkman, S., & Moskowitz, J. T. (2004). Coping: pitfalls and promise. *Annual Review of Psychology, 55,* 745–774.

Gourounti, K., Lykeridou, K., & Vaslamatzis, G. (2012). Increased anxiety and depression in Greek infertile women result from feelings of marital stress and poor marital communication. *Health Science Journal 6*(1), 69-81.

Hajela, S. Prasad, S., Kumaran, A., & Kumar, Y. (2016). Stress and infertility: a review. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology, 5(4),* 940-943. doi: 10.18203/2320-1770.ijrcog20160846

Harder, D. (1984). Character style of the defensively high self-esteem man. *Journal of Clinical Psychology, 40,* 26-36.

Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (2nd edition). New York: The Guilford Press.

Heckhausen, J., & Schulz, R. (1995). A life-span theory of control. *Psychological Review, 102,* 284-304.

Horbst, V. (2010). Male perspective on infertility and assisted reproductive technologies (ART) in Sub-Saharan African context. *FV&V in OBGYN Monograph*, *2010*, 22–27.

Hynes, G. J., Callan, V. J., Terry, D. J. & Gallois, C. (1992). The psychological well-being of infertile women after a failed IVF treatment: the effects of coping. *British Journal of Medical Psychology, 65,* 269 -278.

Joshi, H. l., Singh, R., & Bindu. (2009). Psychological distress, coping and subjective well-being among infertile women. *Journal of Indian Academic and Applied Psychology, 35*(2), 329-336.

Kessler, R., & Mroczek, D. (1997). *Final versions of our non-specific psychological distress scale*. Ann Arbor (MI): Survey Research Center of the Institute for Social Research, University of Michigan, 1994.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping.* New York: Springer.

Litt, N. D., Tennen, H., Affleek, G., & Klock. S. (1992). Coping and cognitive factors in adaption to in vitro fertilization failure. *Journal of Behavioural Medicine, 15,* 171 – 187.

Lord, S. & Robertson, N. (2005). The role of patient appraisal and coping in predicting distress in IVF. *Journal of Reproduction Infant Psychology, 23,* 319-329.

Lykeridou, K., Gourounti, K., Sarantaki, A., Loutradis, D., Vaslamatzis, G., & Deltsidou, A., 2011. Occupational social class, coping responses, and infertility-related stress of women undergoing infertility treatment. *Journal of Clinical Nursing, 20,* 1971–1980.

Mascarenhas, M. N., Flaxman, S. R., Boerma, T., Vanderpoe, l, S. Stevens, G. A. (2012). National, regional, and global trends in infertility prevalence since 1990: A systematic analysis of 277 health surveys. *PLOSMED. 9(12)*, e1001356. doi: 10.1371/journal.pmed.1001356PMID:23271957

Mirowsky, J., & Ross, C. E. (2002). Selecting outcomes for the sociology of mental health: Issues of measurement and dimensionality. *Journal of Health and Social Behavior, 43,* 152-170.

Odiete E, Ajayi A, Afolabi BM, Ajayi V, Biobaku O, & Oyetunji, I. (2016) Assessment of anxiety levels of infertile women and couples presenting for In-Vitro Fertilization procedure in Africa. *Gynecology & Obstetrics, 6,* 393. doi: 10.4172/2161-0932.1000393

Pedro, A. & Mwaba, K. (2013). An exploratory study of South African women's experiences of In-vitro Fertilization and Embryo Transfer (IVF-ET) at fertility clinics. *Open Journal of Preventive Medicine 3,* 470-478.

Robson, P. (1988). Self-esteem: Clinical assessment and measurement validation. *Psychological Reports, 16*, 1017-1071.

Rosenberg, M. (1965). *Society and the adolescent self-image.* Princeton, New Jersey: Princeton University Press.

Schmidt, L., Holstein, B. E, Christensen U & Boivin J. (2005). Communication and coping as predictors of fertility problem stress: cohort study of 816 participants who did not achieve a delivery after 12 months of fertility treatment. *Human Reproduction, 8,* 3248–3256.

Sultan, S. & Tahir, A. (2011). Psychological consequences of infertility. *Hellenic Journal of Psychology, 8,* 229-247.

Tabong, P. T. N. & Adongo, P. B. (2013). Understanding the social meaning of infertility and childbearing: a qualitative study of the perception of childbearing and childlessness in Northern Ghana. *PLoS ONE, 8,* e54429. doi.: 10.1371/journal.pone.0054429

Terry, D. J., & Hynes G. J. (1998). Adjustment to a low-control situation: re-examining the role of coping responses. *Journal of Personnel and Social Psychology, 74*, 1078–1092

Van Balen, F., & Bos, H. M. W. (2009). The social and cultural consequences of being childless. *Obstetrics and Gynecology, 1(2)*, 106-121

Van den Broeck, U., D'Hooghe, T., Enzlin, P., & Demyttenaere, P. (2010). Predictors of psychological distress in patients starting IVF treatment: infertility-specific versus general psychological characteristics. *Human Reproduction, 25(6)*, 1471–1480. doi: 10.1093/humrep/deq030

Verhaak, C. C. (2003). *Emotional impact of unsuccessful fertility treatment in women*. Wageningen: Ponsen & Looyen.