Coping Strategies Mediate the Association Between Stigma and Fertility Quality of Life in Infertile Women Undergoing In Vitro Fertilization Embryo Transfer

Xiaoyu JING
Xian jiaotong University

Wei GU (✉ 232guwei@mail.xjtu.edu.cn)
Xi’an Jiaotong University
https://orcid.org/0000-0002-9934-6946

Lu ZHANG
Xi’an Jiaotong university

Runna MIAO
Xi’an jiaotong university

Xiuli XU
Northeast women’s and children’s hospital

Min WANG
Northeast women’s and children’s hospital

RAMACHDRAN Hadassah Joann
Alice Lee Centre for Nursing Studies

Wenru WANG
Alice Lee Centre for Nursing Studies

Research Article

Keywords: Infertility, Stigma, Coping strategy, Fertility quality of life, Moderating role

Posted Date: February 16th, 2021

DOI: https://doi.org/10.21203/rs.3.rs-198191/v1

License: ☒ This work is licensed under a Creative Commons Attribution 4.0 International License. Read Full License
Abstract

Objective

The aim of this study was to examine the mediating effect of coping strategies on the relationship between stigma and fertility quality of life (FertiQoL) in Chinese infertile women undergoing In Vitro Fertilization Embryo Transfer (IVF-ET).

Methods

In this cross-sectional study, a total of 768 infertile women undergoing IVF-ET were recruited from Assisted Reproductive Center of Shaanxi Province, China. The personal information, infertility stigma scale, coping strategy scale and FertiQoL scale were measured using a set of questionnaires. The multiple mediator model was performed using AMOS 21.0.

Results

The model showed a significant negative direct effect between stigma on FertiQoL (direct effect= -2.375, BC 95% CI= -2.764, -1.987). There were significantly negative indirect effects of stigma on FertiQoL through active-avoidance (indirect effect = -0.706; BC 95% CI = -0.950,-0.497), active-confronting (indirect effect = -0.267; BC 95% CI= -0.414, -0.136) and passive-avoidance (indirect effect= -0.244; BC 95% CI = -0.368,-0.142), respectively. The meaning-based coping played a positive intermediary role (indirect effect=0.105; BC 95% CI = 0.046, 0.190). The model explained 69.4% of the variance in FertiQoL.

Conclusion

Active-avoidance coping strategy is the most important mediator factor between stigma and FertiQoL in infertile women undergoing IVF-ET treatment. Meaning-based coping strategy also plays a positive mediating role between stigma and FertiQoL.

Introduction

Infertility - characterized by the inability of an individual or couple to conceive or have a successful pregnancy after 12 months of regular, unprotected sexual intercourse - is a prevalent disease that affects over 186 million worldwide [1, 2]. Statistical figures have indicated that infertility increases with age, and a recent study in China found that the prevalence of infertility among women of childbearing age was 15.5% [3]. Since the 1970s, In Vitro Fertilization-Embryo Transfer (IVF-ET) has seen steady increases in utilization and remains the hope for many infertile women. However, the technical methods used in the IVF-ET treatment process, such as drug stimulation of ovarian ovulation, transvaginal ultrasound-mediated egg retrieval, and transplantation into the uterine cavity, not only bring physical distress to infertile women but also more psychological distress such as stigma which has been shown to seriously affect their fertility quality of life (FertiQoL) [4–7].
FertiQoL is an individual’s perception and satisfaction with all aspects of life when faced with fertility problems [8], with better FertiQoL of infertile women during infertility treatment being an important outcome indicator in the new medical model. However, studies have convincingly demonstrated that when compared with their fertile counterparts, women undergoing infertility treatment experienced poorer FertiQoL, influenced by numerous factors such as the level of education, residence, infertility-related stress and stigma [9–11]. Specifically, stigma was found to be a strong predictor of FertiQoL among Chinese infertile women undergoing IVF-ET [12].

Stigma is a negative psychological attitude, which has been linked with an array of negative consequences. In many societies, including China, infertility and consequent childlessness are often correlated with stigma and guilt [13]. The stigmatization of women who suffer from infertility and humiliation from family members and the public eye has effects on self-devaluation or social withdrawal [14]. As a result, infertile women are left with a strong sense of loneliness, social and emotional stress, and poor social relationships [15]. Furthermore, infertility treatment itself provokes heavy physical and psychological stress, and women undergoing infertility treatments bear a heavier family and public stigma and a lower quality of life [16, 17]. Additionally, a recent study found stigma to be negatively correlated to FertiQoL among infertile women undergoing IVF-ET [12]. Thus, the mechanism of stigma on FertiQoL warrants further exploration.

We hypothesized that (a) there is a negative correlation between stigma and FertiQoL in infertile women undergoing IVF-ET treatment; and (b) the four coping strategies (active-avoidance, active-confronting, passive-avoidance and meaning-based coping) play a mediating role between stigma and FertiQoL in infertile women undergoing IVF-ET treatment.

**Methods**

**Design and participants**

This study is part of the Research Program of FertiQoL in Infertile Women which is a cross-sectional evaluation of FertiQoL among infertile women in China. A convenience sampling method was used to recruit infertile women from the Assisted Reproductive Center of Shaanxi Province, China from September 2018 to November 2019. The inclusion criteria included women who (a) were diagnosed with infertility and undergoing IVF-ET treatment; (b) aged between 20 and 45 years; and (c) were able to communicate in Chinese. Women with mental disorders or cognitive impairment were excluded.

Multiple linear regression analysis was used to identify the predictive factors of FertiQoL of infertile women undergoing IVF-ET treatment. Based on literature reviews, we had selected a total of 32 factors as independent variables (i.e. educational level, residence, occupation, duration of infertility, stigma, and coping strategy as independent variables), the sample size was 10–20 times of the independent variables. We considered a 20% loss rate, and according to the minimum sample size requirement (> 200) of the structural equation. The final sample size reached for this study was 768.
Instruments

The personal information questionnaire

Information on personal demographics and medical background including age, educational level, residence, occupation, durations of infertility, infertility type, and cycles of IVF-ET were collected.

Infertility Stigma Scale (ISS)

The ISS is a 27-item scale, has four subscales and is developed by Fu et al [14]. The perceived and self-stigma of infertile women were assessed in self-devaluation (7 items), social withdrawal (5 items), public stigma (9 items) and family stigma (6 items). All items are rated on a 5-point Likert scale of 1 (totally disagree) to 5 (totally agree). Total score ranges from 27 to 135, with higher scores indicating increased levels of stigma. The ISS has been demonstrated to have good reliability, with Cronbach's alpha coefficient of 0.94 [14]. The Cronbach's alpha coefficient was 0.95 in this study.

Coping Strategy Scale

The coping strategy scale used is Schmidt's et al version of Copenhagen Multicenter Psychosocial infertility (COMPI) Coping Strategy Scale [21]. The 19-item scale assesses how often infertile women engaged in various coping strategies in response to a particular fertility pressure. The coping strategy scale is categorized into four subscales: 1) active-avoidance strategy (e.g., avoiding pregnant women); 2) active-confronting strategy (e.g., asking medical workers for help); 3) passive-avoidance strategy (e.g., looking forward to miracles); 4) meaning-based coping strategy (e.g., finding other goals in life from infertility). Cronbach's alpha of the four original subscales was 0.68, 0.76, 0.46 and 0.59. In this study, the Cronbach's alpha was 0.60 ~ 0.74.

Fertility Quality of Life Scale (FertiQoL scale)

FertiQoL scale is used to assess the quality of life of the participants [8]. The FertiQoL scale consists of 36 items, out of which 2 single items are used to assess the general health and life satisfaction. The remaining 34 items are comprised of two domains: Core FertiQoL and Treatment FertiQoL. Core FertiQoL consists of four subscales: emotional (6 items), mind-body (6 items), relational (6 items) and social (6 items). Treatment FertiQoL consists of two subscales: treatment environment (6 items) and treatment tolerability (4 items) [8]. This is a 5-point Likert scale with total scores ranging from 0 to 100. The Chinese version of the FertiQoL had demonstrated good validity and reliability with Cronbach's alpha of 0.925 [15, 25]. The Cronbach's alpha coefficient of FertiQoL in this study was 0.906.

Ethics considerations

Ethics approval was obtained from the study hospital (Ref. No. 2019.015). All study participants were guaranteed confidentiality and were informed that their participation was voluntary.

Data collection procedure
The researcher approached potential participants in the waiting area of the IVF-ET operating room on the day of embryo transfer at the study center. Eligible participants were selected based on the inclusion criteria. A nurse employed by the study center assisted the researcher to explain the purpose of the study to the participants and sign the informed consent. The four self-reported scales were administered online using QR scan. A total of 800 infertile women attempted the questionnaire and each questionnaire took between 20–30 minutes to complete. 32 questionnaires had missing or incorrect data and were excluded from the study (response rate = 96%).

Data analysis

The SPSS24.0 and AMOS21.0 were used to analyze the data. Pearson’s correlation was used to test the correlations between ISS, coping strategy and FertiQoL scores. To determine the mediating role of coping strategies, multiple mediator model was performed for each independent variable separately. Four mediators (active-avoidance, active-confronting, passive-avoidance, meaning-based coping) were tested. The significance of indirect effect was tested using percentile bootstrapping to estimate the standard error and the 95% confidence interval.

Result

Characteristics of infertile women

The characteristics of the participants are presented in Table 1. A total of 768 infertile women undergoing IVF-ET completed the online questionnaire survey. The mean age of the participants was 30.93 (SD = 4.08). Over half of the infertile women (n = 417, 54.3%) had university-level of education and nearly half of them (n = 342, 43.7%) resided in cities. Most of the infertile women (n = 492, 64.1%) had no insurance support. About half of infertile women (n = 414, 53.9%) had secondary infertility and 58.1% were receiving infertility treatment for the first time. Majority (n = 667, 86.8 %) were undergoing their first IVF-ET. A more detailed description of these women can be found in an earlier publication by Jing et al [12].
Table 1
Characteristics of infertile women undergoing IVF-ET treatment

| Item                        | n   | %   |
|-----------------------------|-----|-----|
| **Age**                     |     |     |
| 20–25                       | 53  | 6.9 |
| 26–31                       | 416 | 54.2|
| 32–37                       | 238 | 31.0|
| >37                         | 61  | 7.9 |
| **Educational level**       |     |     |
| Primary                     | 183 | 23.8|
| Secondary                   | 168 | 21.9|
| University                  | 417 | 54.3|
| **Residence**               |     |     |
| Countryside                 | 260 | 33.9|
| Town                        | 166 | 21.6|
| City                        | 342 | 44.5|
| **Length of marriage (year)** |     |     |
| 1–3                         | 343 | 44.7|
| 4–6                         | 247 | 32.2|
| >6                          | 178 | 23.1|
| **Financial condition (Chinese ¥)** |   |     |
| ≤ 3000                      | 295 | 38.4|
| 3001–5000                   | 320 | 41.7|
| >5000                       | 153 | 19.9|
| **Duration of infertility (year)** |     |     |
| ≤ 3                         | 474 | 61.7|
| >3                          | 294 | 38.3|
| **Religious beliefs**       |     |     |
| Yes                         | 20  | 2.6 |
### Item n %

| Item                                      | n   | %   |
|-------------------------------------------|-----|-----|
| No                                        | 748 | 97.4|
| **Type of infertility**                   |     |     |
| Primary infertility                       | 354 | 46.1|
| Secondary infertility                     | 414 | 53.9|
| **History of infertility treatment**      |     |     |
| Yes                                       | 322 | 41.9|
| No                                        | 446 | 58.1|
| **History of IVF-ET treatment**           |     |     |
| Yes                                       | 101 | 13.2|
| No                                        | 667 | 86.8|
| **Insurance**                             |     |     |
| Yes                                       | 276 | 35.9|
| No                                        | 492 | 64.1|

**Correlation among subscales of ISS, coping strategy and FertiQoL**

Pearson’s correlation analysis was performed to test relationships among the subscales of stigma, coping strategy and FertiQoL scores, and the results are presented in Table 2. There were significant negative correlations among subscales of stigma and FertiQoL ($r = -0.096 \sim -0.645$, $p < 0.05$). Except for the dimension of treatment environment under FertiQoL, active-avoidance, passive-avoidance and active-confronting were significantly negatively correlated with other dimensions of FertiQoL ($r = -0.106 \sim -0.602$, $p < 0.05$). A significantly positive correlation between meaning-based coping and relational and treatment environment was found ($r = 0.077; 0.087$, $p < 0.05$) (Table 2).
Table 2
Correlation among subscales of ISS, coping strategy and FertiQoL (r)

| Item | 2   | 3   | 4    | 5    | 6    |
|------|-----|-----|------|------|------|
| 1    |     |     |      |      |      |
| 2    | 0.592** |     | 0.381** | 0.375** | 0.157** | -0.686** |
| 3    | 0.381** | 0.497** | 0.531** | 0.399** | -0.611** |
| 4    | 0.375** | 0.531** | 0.444** | 0.380** | -0.406** |
| 5    | 0.157** | 0.399** | 0.535 | 0.380** | -0.124** |
| 6    | -0.686** | -0.611** | -0.409** | -0.406** | -0.124** |

**p < 0.01; 1: stigma; 2: Active-avoidance; 3: Active-confronting; 4: Passive-avoidance; 5: Meaning-based; 6: FertiQoL.

The mediating roles of coping strategies

Figure 1 shows the mediation model with standardized regression coefficients. Indices of goodness-of-fit of the model showed a desirable fit, with CMIN/DF = 3.213, GFI = 0.970, CFI = 0.982 and RMSEA = 0.054. The model showed a significant negative direct effect between stigma and FertiQoL (direct effect = -2.375, BC 95% CI= -2.764,-1.987). There were also significantly negative indirect effects of stigma on FertiQoL through active-avoidance (indirect effect = -0.706; BC 95% CI= -0.950, -0.497), active-confronting (indirect effect = -0.267; BC 95% CI= -0.414, -0.136) and passive-avoidance (indirect effect = -0.244; BC 95% CI = -0.368, -0.142) respectively. However, there was a significantly positive mediating effect of meaning-based between stigma and FertiQoL (indirect effect = 0.105; BC 95% CI = 0.046, 0.190). The model explained 69.4% of the variance in FertiQoL (Fig. 1 and Table 3)
Table 3
Mediation of coping strategies between stigma and FertiQoL in infertile women undergoing IVF-ET treatment

| Point Estimate | Product of Coefficients | Bootstrapping |
|----------------|--------------------------|---------------|
|                |                          | BC 95% CI     |
|                |                          | Percentile 95%CI |
|                | SE  | Z       | Lower | Upper | Lower | Upper |

Indirect Effects

- Active-avoidance: -0.704, 0.115, -6.122, -0.950, -0.497, -0.938, -0.486
- Active-confronting: -0.267, 0.069, -3.870, -0.414, -0.136, -0.409, -0.131
- Passive-avoidance: -0.244, 0.058, -4.207, -0.368, -0.142, -0.361, -0.136
- Meaning-based: 0.105, 0.037, 2.838, 0.046, 0.190, 0.043, 0.185
- Total: -1.111, 0.118, -9.415, -1.372, -0.902, -1.354, -0.891

Contrasts

- Active-avoidance Vs Active-confronting: -0.438, 0.137, -3.197, -0.725, -0.186, -0.712, -0.168
- Active-confronting Vs Passive-avoidance: -0.022, 0.097, -0.227, -0.207, 0.173, -0.213, 0.164
- Passive-avoidance Vs Meaning-based: -0.349, 0.071, -4.915, -0.506, -0.224, -0.500, -0.219
- Meaning-based Vs Active-avoidance: 0.809, 0.128, 6.320, 0.576, 1.084, 0.567, 1.073

Discussion

Our study results showed that avoidance coping strategy played the strongest mediating effect between stigma and FertiQoL by increasing the negative effect of stigma on FertiQoL. This has also been demonstrated in previous studies where stigma was positively correlated with avoidance coping strategy, while avoidance coping strategy was negatively related to FertiQoL [26, 27]. This indicates that infertile women with high levels of stigma were more likely to avoid contact with pregnant women or children, especially during infertility treatment. This inadvertently reduces their social communication and interaction, and leads to a deterioration of their FertiQoL. As IVF-ET treatments require women to maintain treatment continuity and strict compliance to prescribed medications, the use of an avoidance coping strategy may lead infertile women to be more reluctant to engage in and complete the IVF-ET treatment, resulting in longer treatment time and lower quality of life. Our result is also consistent with another study conducted in patients with convalescent schizophrenia in China [28]. This study reported that avoiding
coping strategy played a significantly negative mediating role between stigma and quality of life - the more women used avoiding coping strategies, the higher their level of stigma and the lower quality of life. Similarly, in another study on pulmonary cancer patients, it was reported that avoidance coping strategy played a significant mediating effect between stigma and patients’ quality of life [29].

The multiple mediator model (Fig. 1) showed that active-confronting coping strategy also played a negatively moderating role between stigma and FertiQoL. This is not in line with other studies, which reported that positive and active coping strategies could reduce the negative impact of stigma on quality of life [22]. Folkman et al proposed that the effectiveness of a particular coping strategy is dependent on the match or goodness of fit between the strategy and the controllability of the event [30]. Considering that undergoing IVF-ET treatment is an extremely complicated and uncontrollable treatment where results are often uncertain, the use of an active medical seeking behavior may have proved counter-productive to the 86.8% of infertile women in this study. Efforts of infertile women to manage their treatment actively may engender feelings of frustration and disappointment, which is likely to have deleterious effects on infertile women themselves. This is echoed by Terry et al, who reported that the effect of actively coping strategies was instable when an individual faced an uncontrollable stressor [31]. Conversely, our results showed that meaning-based coping strategy played a positive mediating role between stigma and FertiQoL. Infertile women who respond to infertility by praying or finding other goals can achieve better FertiQoL and lower stigma. This may lie in the fact that the meaning-based coping strategy can transfer the infertility pressure and make infertile women find new spiritual sustenance and assistance, thus reducing the impact of stigma on infertile women's FertiQoL. This is consistent with previous research results on meaning-based coping being conducive to the improvement of marital relationship and FertiQoL in infertile women [26, 32].

In addition to the mediating effects of the four coping strategies, our results also indicated that stigma may play an important role as an internal resource mediated by coping strategies in managing and controlling daily life among infertile women. Goffman claimed that no matter whether the stigma is visible or hidden, an individual may experience discrimination [33]. This means that the stigmatization that infertile women experience is deeply rooted in her perceived discrepancy between what society dictates of her and the factual standard of her identity. This has been linked with an array of negative consequences, where the level of stigma is positively related to negative emotions such as stress and anxiety, and where high stigma affects the behavior of infertile women seeking medical treatment, thus leading to a further deterioration in her FertiQoL [13, 16, 34]. As the results of this study showed, there was a significantly negative correlation between stigma and FertiQoL. This is also supported by previous qualitative studies, where infertile women perceived that their daily lives were disrupted, and their marital relationship to have deteriorated, and complained that they had lower social status and social support during fertility treatment [35, 36].

Limitation And Conclusion
Convenience sampling was used in this study and the participants were recruited from a single center, which may have caused sampling bias and limited the generalizability of the findings to the population of women with infertility in China. Furthermore, as the clinical pregnancy outcomes of the participants were not traced in this cross-sectional study, the causal relationship between variables studied cannot be established.

Our study showed a significant association between stigma and FertiQoL with a mediating role of coping strategy. This may provide further understanding on how stigma influences FertiQoL among Chinese infertile women undergoing IVF-ET treatment. Avoidance coping strategy was identified to play the most important negatively mediating factor between stigma and FertiQoL in Chinese infertile women undergoing IVF-ET treatment. In addition, meaning-based coping strategy played a significantly positive mediating role between stigma and FertiQoL. The healthcare professionals should consider the role of coping strategies when they develop the interventions to reduce stigma and enhance the quality of life of infertile women undergoing IVF-ET treatment.

Declarations

ACKNOWLEDGEMENT

All authors appreciate all the participants who showed great patience in answering the questionnaires.

CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

ETHICAL APPROVAL

The study received approval from the Northwest Women's and Children's Hospital Affiliated To Xi'an Jiaotong University (Ref. No. 2019.015).

INFORMED CONSENT

All study participants provided written informed consent to participate in the study

References

1. Zegers-Hochschild F, Adamson GD, Dyer S, Racowsky C, de Mouzon J, Sokol R, et al. (2017). The International Glossary on Infertility and Fertility Care. *Fertility and Sterility*, 108(3); 393-406. https://doi.org/10.1016/j.fertnstert.2017.06.005.

2. Vander Borght M, Wyns C. (2018). Fertility and infertility: Definition and epidemiology. *Clinical Biochemistry*, 62:2-10. https://doi.org/10.1016/j.clinbiochem.2018.03.012.

3. Zhou Z, Zheng D, Wu H, Li R, Xu S, Kang Y, et al. (2018). Epidemiology of infertility in China: a population-based study. *BJOG*, 125:432-441. https://doi.org/10.1111/1471-0528.14966.
4. Adamson GD, de Mouzon J, Chambers GM, Zegers-Hochschild F, Mansour R, Ishihara O, et al. (2011). International Committee for Monitoring Assisted Reproductive Technology: world report on assisted reproductive technology. *Fertility and Sterility*, 110(6):1067-1080. https://doi.org/10.1016/j.fertnstert.2018.06.039.

5. Castillo CM, Horne G, Fitzgerald CT, Johnstone ED, Brison DR, Roberts SA. (2019). The impact of IVF on birthweight from 1991 to 2015: a cross-sectional study. *Human Reproduction*, 34(5):920-931. https://doi.org/10.1093/humrep/dez025.

6. Liu Y, Zeng S, Sun H. (2018). A review of the influence of assisted reproductive technology on quality of life in women with infertility. *Medicine Philosophy*. 6(39):55-59. https://doi.org/10.12014/j.issn.1002-0772.2018.06b.16.

7. Schaller MA, Griesinger G, Banz-Jansen C. (2016). Women show a higher level of anxiety during IVF treatment than men and hold different concerns: a cohort study. *Archives of gynecology and obstetrics*, 293(5):1137-1145. https://doi.org/10.1007/s00404-016-4033-x.

8. Boivin J, Takefman J, Braverman A. (2011). The fertility quality of life (FertiQoL) tool: development and general psychometric properties. *Human Reproduction*, 26(8):2084-2091. https://doi.org/10.1093/humrep/der171.

9. Namdar A, Naghizadeh MM, Zamani M, Yaghmaei F, Sameni MH. (2017). Quality of life and general health of infertile women. *Health and Quality of Life Outcomes*, 15(1):139. https://doi.org/10.1186/s12955-017-0712-y.

10. Aduloju OP, Olaogun OD, Aduloju T. Quality of life in women of reproductive age: a comparative study of infertile and fertile women in a Nigerian tertiary Centre. *J Obstet Gynaecol*. 2018; 38:247-251.

11. Aduloju OP, Olaogun OD, Aduloju T. (2018). Quality of life in women of reproductive age: a comparative study of infertile and fertile women in a Nigerian tertiary Centre. *Journal of Obstetrics and Gynaecology*, 38(2):247-251. https://doi.org/10.1080/01443615.2017.1347916.

12. Jing X, Gu W, Xu X, Yan C, Jiao P, Zhang L, et al. (2020). Stigma predicting fertility quality of life among Chinese infertile women undergoing in vitro fertilization-embryo transfer. *Journal of Psychosomatic Obstetrics & Gynecology*, 1-7. https://doi.org/10.1080/0167482X.2020.1778665..

13. Jansen NA, Saint Onge JM. (2015). An internet forum analysis of stigma power perceptions among women seeking fertility treatment in the United States. *Social Science & Medicine*, 147:184-189. https://doi.org/10.1016/j.socscimed.2015.11.002.

14. Fu B, Qin N, Cheng L, Tang G, Cao Y, Yan C, et al. (2015). Development and validation of an Infertility Stigma Scale for Chinese women. *Journal of Psychosomatic Research*, 79(1):69-75. https://doi.org/10.1016/j.jpsychores.2014.11.014.

15. Li Y, Zhang X, Shi M, Guo S, Wang L. (2019). Resilience acts as a moderator in the relationship between infertility-related stress and fertility quality of life among women with infertility: a cross-sectional study. *Health and Quality of Life Outcomes*, 17(1):38. https://doi.org/10.1186/s12955-019-1099-8.
16. Ozturk R, Bloom TL, Li Y, Bullock L. (2020). Stress, stigma, violence experiences and social support of us infertile women. *Journal of Reproductive and Infant Psychology*, 1-13. https://doi.org/10.1080/02646838.2020.1754373.

17. Ergin RN, Polat A, Kars B, Oztekin D, Sofuoglu K, Caliskan E. (2018). Social stigma and familial attitudes related to infertility. *Turkish Journal of Obstetrics and Gynecology*, 15(1):46-49. https://doi.org/10.4274/tjod.04307.

18. Yuan Y. (2017). The mediating effects of coping modes between acceptance of disability and quality of life among patients with a permanent colostomy. Qingdao: Qingdao University.

19. Karaca A, Unsal G. (2015). Psychosocial Problems and Coping Strategies among Turkish Women with Infertility. *Asian Nursing Research*, 9(3):243-250. https://doi.org/10.1016/j.anr.2015.04.007.

20. Benyamini Y, Gozlan M, Weissman A. (2017). Normalization as a Strategy for Maintaining Quality of Life While Coping with Infertility in a Pronatalist Culture. *Journal of Behavioral Medicine*, 24(6):871-879. https://doi.org/10.1007/s12529-017-9656-1.

21. Schmidt L, Christensen U, Holstein BE. (2005). The social epidemiology of coping with infertility. *Hum Reprod*. 20(4) 1044-1052. https://doi.org/10.1093/humrep/deh687

22. Xu F. (2016). The Correlation between Stigma and Coping modes: Stoma-adjustment, Quality of Life in Colorectal Cancer Patients with Permanent Stoma. Hefei: Anhui Medical University.

23. Ried K, Alfred A. (2013). Quality of life, coping strategies and support needs of women seeking Traditional Chinese Medicine for infertility and viable pregnancy in Australia: a mixed methods approach. *Bmc Womens Health*. 2013; 13:17. https://doi.org/10.1186/1472-6874-13-17.

24. Rodino IS, Gignac GE, Sanders KA. (2018). Stress has a direct and indirect effect on eating pathology in infertile women: avoidant coping style as a mediator. *Reproductive Biomedicine & Society Online*. 2018; 5:110-118. https://doi.org/10.1016/j.rbms.2018.03.002.

25. Yang X. (2016). A validity and reliability study of the fertility quality of life (FertiQoL) tool in Chinese People. Guangzhou: Southern Medical University;

26. Li J. (2016). The effects of a mindfulness-based intervention on fertility quality of life among IVF-ET women and its psychological mechanisms. Chongqing: Third Military Medical University.

27. Kaya Z, Oskay U. (2020). Stigma, hopelessness and coping experiences of Turkish women with infertility. *Journal of Reproductive and Infant Psychology*, 38(5):485-496. https://doi.org/10.1080/02646838.2019.1650904.

28. Hong Y, Lina W, Yuqiu Z, Guohua L, Ailin Y, Yujing S. (2015). The effect of stigma on the quality of life among convalescent schizophrenia patients: the mediating effect of social support and coping style. *Chinese Nursing Management*, 15(4):424-428. https://doi.org/10.3969/j.issn.1672-1756.2015.04.012

29. Ren Z. (2019). Correlation and path analysis of symptoms of pulmonary cancer with coping style, social support and quality of life. Nanning: Guangxi Medical University.

30. Folkman S, Lazarus RS. (1986). Dynamics of a stressful encounter: Cognitive appraisal, coping, and encounter outcomes. *Journal of Personality and Social Psychology*, 50(5):992-1003.
31. Terry DJ, Hynes GJ. (1998). Adjustment to a Low-Control Situation: Reexamining the Role of Coping Responses. *Journal of Personality and Social Psychology, 74*(4):1078. https://doi.org/10.1037/0022-3514.74.4.1078.

32. Peterson BD, Pirritano M, Block JM, Schmidt L. (2011). Marital benefit and coping strategies in men and women undergoing unsuccessful fertility treatments over a 5-year period. *Fertility and sterility, 95*(5):1759-1763. https://doi.org/10.1016/j.fertnstert.2011.01.125.

33. Goffman E. (1963). Stigma: Notes on the Management of Spoiled Identity. *New York*: Prentice Hall.

34. Daibes MA, Safadi RR, Athamneh T, Anees IF, Constantino RE. (2018). ‘Half a woman, half a man; that is how they make me feel’: a qualitative study of rural Jordanian women’s experience of infertility. *Culture health and sexuality, 20*(5):516-530. https://doi.org/10.1080/13691058.2017.1359672.

35. Naab F, Lawali Y, Donkor ES. “My mother in-law forced my husband to divorce me”: Experiences of women with infertility in Zamfara State of Nigeria. *PLOS ONE*, 2019; 14(12): 225149. https://doi.org/10.1371/journal.pone.0225149.

36. Aghakhani N, Marianne Ewalds-Kvist B, Sheikhan F, Merghati Khoei E. (2020) Iranian women’s experiences of infertility: A qualitative study. *International Journal of Reproductive Biomedicine, 18*(1):65-72. https://doi.org/10.18502/ijrm.v18i1.6203.

**Figures**
Figure 1

Coping strategies as mediators in the relationship between stigma and FertiQoL