The Effect of Depression in High-Risk Pregnant Women On Self-Care Agency: The Mediating Role of Resourcefulness

ke Zhang

Lanzhou University

hongxia Tao

Lanzhou University

yanhong Wang (✉ yanhongwang@lzu.edu.cn)

Lanzhou University

Research Article

Keywords: high-risk pregnancy, self-care agency, resourcefulness, depression

Posted Date: September 15th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-828874/v1>

License: This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Background

Mental problems such as anxiety and depression are prominent among high-risk pregnant women, and their self-care agency is poor. As an effective cognitive-behavioral self-control technique, resourcefulness's mechanism in the effect of depression on self-care agency is still unclear. Therefore, this article aims to construct and test a hypothetical model linking the resourcefulness of high-risk pregnant women with depression and prenatal self-care agency.

Methods

500 high-risk pregnant women from three tertiary hospitals in Gansu, North-west of China, were recruited. Chinese Resourcefulness Scale, the Reliability and Validity of Patient Health Questionnaire Module (PHQ-9), and Exercise of Self-Care Agency Scale were used. Structural equation modeling was used to explore the path relationships and mutual effects between resourcefulness, depression and self-care agency.

Results

Self-care agency is a protective factor for depression in high-risk pregnant women ($OR = 0.49$, 95% CI : $0.32 \sim 0.75$). The level of resourcefulness is negatively correlated with depression ($r = -0.34$, $P < 0.01$). Resourcefulness has a direct positive predictive effect on the self-care agency of high-risk pregnant women ($r = 0.52$, $P < 0.01$). The resourcefulness is a mediating variable between depression and self-care agency, and the mediating effect accounts for 65.99% of the total effect.

Conclusion

Resourcefulness is a mediating variable between depression and self-care agency in high-risk pregnant women. Nurses should pay attention to the level of resourcefulness of high-risk pregnant women and conduct positive assessments, so as to take intervention to reduce the level of depression and increase self-care agency.

1 Background

High-risk pregnancy refers to pregnancy that has certain complications or pathogenic factors that may harm pregnant women, fetuses, newborns or may cause dystocia during labor(1). In 2019, World Health Organization(WHO)reported that the incidence of high-risk pregnancy is about 6–33% globally, about 830 pregnant women died every day, of which 75% had one or more complications(2). The situation was more serious in China. The incidence of high-risk pregnancy in China ranged from 43.2–65.0%, which is significantly higher than the global level. High-risk pregnancy led to maternal bleeding and infection, fetal

malformations, neonatal respiratory distress, and even threatening the lives of mothers and newborns. Hence, psychological problems such as anxiety and depression are more prominent among high-risk pregnant women.

A number of studies have shown that the incidence of depression in high-risk pregnant women ranged from 28%~39.1%(3–7). Prenatal depression can even cause eclampsia, premature birth and increase the risk of postpartum hemorrhage. In addition, pregnant women with prenatal depression can also affect the offspring's brain development, leading to fetal growth restriction or low birth weight babies(8, 9), and the offspring are more likely to get mental illnesses(10). However, studies have found that the level of self-care can affect patients' self-esteem, decision-making and choice of health-related activities and even change the appearance of depression(11). Self-care agency refers to the comprehensive ability of an individual or family to use internal and external environments and resources to implement self-care to maintain and promote health in order to protect the health of life and maintain its integrity(12). However, the mechanism of how prenatal self-care affects depression is unclear(13).

A study of pregnant women with HIV showed that learned-resourcefulness has an important influence on prenatal self-care agency(14). learned-resourcefulness is the personal skills including beliefs, cognition, and behavioral skills which used to manage certain adverse effects in the face of stress. When an individual has difficulty or pressure and cannot perform daily functions independently, he gets help from the outside world. This ability is called social-resourcefulness and is the ability to use external resources. The two together constitute the concept of "resourcefulness". Therefore, high-resourceful people can make better use of internal and external environment and resources. Although the relationship between resourcefulness and lifestyle has been studied, it is not clear how it affects healthy lifestyles and behaviors in high-risk pregnant women to maintain and promote health and improve self-care agency. Therefore, it is necessary to explore the relationship between resourcefulness influence on the depressive symptoms of high-risk pregnant women and prenatal self-care agency.

Other studies have found an association between resourcefulness and depression. For example, a survey conducted by Ngai on 360 Hong Kong pregnant women found that a high level of resourcefulness was associated with fewer depressive symptoms during pregnancy(15). Researchers also have found that resourcefulness strategies are effective in helping older family caregivers cope with stress and mitigate negative emotions and to provide better care for their elderly relatives. To improve the level of resourcefulness of the elderly can significantly affect the symptoms of depression at home(16). So far, no research has been retrieved for resourcefulness on depression and self-care agency among high-risk pregnant women. Therefore, this study aims to construct and test a hypothetical model linking the resourcefulness of high-risk pregnant women with depression and prenatal self-care agency in order to provide scientific basis and guidance for the intervention of depression and self-care agency in high-risk pregnant women and improve the quality of life and pregnancy outcome of high-risk pregnant women.

2 Methods

2.1 Settings and sample

In 2020, 500 high-risk pregnant women in three tertiary hospitals in Lanzhou, a city in north-west of China, were recruited through convince sampling method. Women diagnosed as high-risk pregnancy according to the high-risk pregnancy score (Score according to the revised Nesbitt-Aubry scale and if the score is less than 70 points, it belongs to the category of high-risk pregnancy) were enrolled. Women who have entered the labor period (regular contractions), suffering from mental health related illness and unstable condition were excluded. 530 questionnaires were distributed, and 500 valid responses were obtained (response rate 94.34%).

2.2 Measures

2.2.1 The Chinese Resourcefulness Scale

Zauszniewski and Lai developed a 28-item Self-Control Schedule (SCS) in 2006 (17). In 2015 SCS was translated and revised Self-Control Schedule and developed Chinese Resourcefulness Scale (CRS) (18), which had two dimension: learned resourcefulness (16 items) and social resourcefulness (12 items). Each item was scored from 0 (never) to 5 (always). The total scores range from 0 to 140. The score on the scale is positively correlated with the level of resourcefulness of the respondent. An internal consistency of 0.825 has been reported.

2.2.2 The Reliability and Validity of Patient Health Questionnaire Module (PHQ-9)

The Reliability and Validity of Patient Health Questionnaire Module (PHQ-9) is a self-rating depression scale revised on the basis of the DSM-IV (Diagnostic and Statistical Manual of Mental Disorders) depression diagnostic criteria. It can be used for the diagnostic screening of depression in the general population (19, 20). This scale has 9 items ranging from 0 to 27. Each response is scored from 0 to 3 on a scale of frequency of occurrence varying from "none of time" to "most or all of day". A score of 10 is considered indicative of the possible presence of symptoms and 15 or more reflects significant depression. High scores indicate a high level of depression. The internal reliability of the PHQ-9 was excellent, with a Cronbach's α of 0.89 in the PHQ Primary Care Study and 0.86 in the PHQ Ob-Gyn Study (21). The Chinese translation of PHQ-9 has been proven to have good reliability, validity and feasibility with Cronbach's α of 0.820, the average *CVI* of 0.96. Factor analysis showed good structural validity, with a sensitivity of 88.31% and a specificity of 82.50%. The *ROC* curve showed that the area under the curve is more than 0.5.

2.2.3 Exercise of Self-Care Agency Scale

The Exercise of Self-Care Agency Scale(ESCA) was constructed by Kearny and Fleischer in 1979 based on the Orem self-care theory for adults' self-care ability evaluation(22). The English version which was translated into Chinese and cultural adaptation has four dimension(23): Self-concept, self-care responsibility, self-care skills and health knowledge level. The ESCA is a 43-item scale with 5-point Likert-type format ranging from 0 ~ 4. The range of possible scores is 0 ~ 172, which divided into low level(0 ~ 57 points), medium level(58 ~ 115 points)and high level(116 ~ 172 points). The score is directly proportional to self-care agency(24). Its reliability was 0.88 and Cronbach's α coefficients were 0.77 ~ 0.80.

2.3 Data analyses

Data were analyzed by SPSS statistics version 23.0 and Mplus version 8.1. Descriptive statistics were used to report the participants' general characteristics. Pearson product-moment correlations was used to analyze the relationship between depression, resourcefulness and self-care agency. A structural equation model was established and Bootstrap method to test the mediating role ($\alpha = 0.05$). The model was tested by the goodness of fit test. Among the above indicators, the most important is the chi-square value (χ^2), the chi-square degrees of freedom (χ^2/df), the root means square residual (*RMSEA*), the Tucker-Lewis index (*TLI*) and the comparative fitting index (*CFI*).

This study reduces bias with procedure control measures such as collect information anonymously and partial entry reverse(25). Harman's single factor test was used for unrotated exploratory factor analysis. The results showed that a total of 19 common factors with a characteristic root greater than 1 were proposed, and the largest factor explained 21.29% (less than 40%) of the total variance. Therefore, there is no serious common method deviation in this study.

3 Results

3.1 Demographic characteristics

The average age of 500 high-risk pregnant women is 29.61 ± 4.79 years old (Table 1).

Table 1
Participant characteristics(*n* = 500)

Variable	<i>N</i> (%)
Age	
18 ~ 24	63(12.6)
25 ~ 30	248(49.6)
31 ~ 35	130(26.0)
> 35	59(11.8)
Nationality	
Han	421(84.2)
Other nationality	79(15.8)
Education	
Secondary or below	190(38.0)
Tertiary	126(25.2)
University degree	156(31.2)
Master degree and above	28(5.6)
Family monthly income per capita(US Dollar)	
<\$461.50	177(35.4)
\$461.50~\$769.17	188(37.6)
>\$769.17	135(27.0)
Gestational week	
≤ 13W	27(5.4)
14 ~ 27W	82(16.4)
28 ~ 39W	328(65.6)
≥ 40W	63(12.6)
First pregnancy	
Yes	239(47.8)
No	261(52.2)
Number of pregnancies	
≤ 2	194(38.8)

Variable	N(%)
> 2	141(28.2)
Prenatal diagnosis	
Yes	176(35.2)
No	324(64.8)

3.2 Findings

Depression, resourcefulness, and self-care agency among high-risk pregnancy women are shown in Table 2.

Table 2
The scores of various dimensions($n = 500$)

Scale	$M \pm SD$
Depression	4.84 ± 3.07
emotional aspect	3.46 ± 2.91
physical symptoms	2.06 ± 1.54
Resourcefulness	97.14 ± 18.77
learned-resourcefulness	56.31 ± 10.92
social-resourcefulness	37.30 ± 8.28
Self-care agency	110.34 ± 18.86
self-care skills	33.52 ± 7.06
self-care responsibility	12.04 ± 4.72
self-concept	21.75 ± 4.64
health knowledge level	43.03 ± 7.81

3.3 Correlation analysis between variables

Among the high-risk pregnant women, resourcefulness is negatively correlated with depression($r=-0.34$, $P < 0.01$); resourcefulness is positively correlated with self-care agency($r= 0.52$, $P < 0.01$); and self-care ability is negatively correlated with depression($r=-0.32$, $P < 0.01$) (Table 3).

Table 3
Correlations for the Study Variables

	1	2	3	4	5	6	7	8
1	1	-	-	-	-	-	-	-
2	0.05	1	-	-	-	-	-	-
3	0.69**	0.19**	1	-	-	-	-	-
4	0.76**	0.13**	0.69**	1	-	-	-	-
5	0.62**	-0.00	0.46**	0.51**	1	-	-	-
6	0.49**	-0.04	0.31**	0.40**	0.77**	1	-	-
7	-0.26**	-0.18**	-0.32**	-0.29**	-0.37**	-0.29**	1	-
8	-0.16**	-0.11*	-0.20**	-0.18**	-0.24**	-0.24**	0.61**	1
**: $P < 0.01$; *: $P < 0.05$								
1:self-care skills. 2:self-care responsibility. 3:self-concept. 4:health knowledge level								
5:learned-resourcefulness. 6:social-resourcefulness. 7:emotional aspect. 8:Physical symptoms								

3.4 Structural model test

Taking depression as the independent variable, resourcefulness as the mediating variable, and self-care agency as the dependent variable, the structural equation model was constructed using Mplus version 8.1, and the maximum likelihood method was used to modify and fit the model, and the mediating effect of resourcefulness was tested. The results show that: $\chi^2/df < 5$, $RMSEA = 0.089$, $SRMR = 0.042$, $CFI = 0.964$, $TLI = 0.941$. Model fit index shows that the model is acceptable(26).

The bootstrap method was used to test the significance of the mediation effect. The results show that the 95% confidence interval of the mediation effect is(-0.441, -0.243). Therefore, the mediation effect is significant. The part of the mediation effect model of resourcefulness is established. The direct effect of depression on self-care agency in high-risk pregnant women is -0.117, the direct effect of resourcefulness on self-care agency is 0.595, and the direct effect of depression on self-care agency is -0.382, as shown in Fig. 1. Based on the above results, we can further know that the indirect effect of depression on self-care agency through resourcefulness is $-0.382 \times 0.595 = -0.227$, and the total effect is $-0.117 + (-0.227) = -0.344$, accounting for 65.99% of the total effect.

4 Discussion

This study provides a new theoretical basis for resourcefulness in promoting perinatal health. The results of the study show that resourcefulness plays an intermediary role between depression and prenatal self-

care agency which provides additional support for the negative impact of previous depression on the self-care agency of high-risk pregnant women.

High-risk pregnancy women's resourcefulness score ranged from 17 to 135 points, with an average score of 97.14 ± 18.77 , which was at a relatively high level. It is similar to the research results of He(27). For high-risk pregnant women, the complications of pregnancy, the limitation of activities, feeling more vulnerable, and more need for partner's support will increase their ability to use external resources(i.e., family, social support system), which lead to the improvement of their social-resourcefulness. In addition, facing the pressure of high-risk factors, pregnant women will accumulate the habitual response patterns intentionally or unconsciously to gain learned-resourcefulness. Our study found that high-risk pregnant women had higher learned-resourcefulness scores than social-resourcefulness(56.31 ± 10.92 vs. 37.30 ± 8.28), which consistent with previous findings. He et al' study(27) support that pregnant women are generally better in learned-resourcefulness and are better able to cope with stress during pregnancy and childbirth. Besides, the high-risk pregnant women may be influenced by the traditional Chinese thoughts of "self-seeking is better than seeking others" and they tend to solve problems on their own and rarely receive medical or family help, so the level of learned-resourcefulness is high.

In our study, the level of resourcefulness is positively correlated with the agency of prenatal self-care among high-risk pregnant women($r = 0.52$, $P < 0.01$). Previous studies have found a positive relationship between resourcefulness and healthy behaviors, such as smoking cessation(28), health practices for women with diabetes(29), and changes in eating habits(30). In our study, pregnant women with a high level of resourcefulness can correctly assess high-risk factors and make full use of social support to maintain and promote physical and mental health. The depression level of high-risk pregnant women is negative related to self-care agency during pregnancy ($r = -0.32$, $P < 0.01$) and is an important predictor of prenatal self-care agency. Endler(31) et al.'s avoidance-oriented stress coping theory shows that when the patient's negative emotions accumulate to a certain extent, the coping style also changes from positive to negative. The results showed that the degree of depression of high-risk pregnant women can negatively predict their level of resourcefulness(including both learned-resourcefulness and social-resourcefulness aspects)($r = -0.34$, $P < 0.01$). In consistent to Rosenbaum's point of view, the level of learned resourcefulness can have a beneficial effect on the individual's mental health in the face of stress. Learned-resourcefulness is the cognitive-behavioral skills accumulated and acquired by individuals in their lives. It helps individuals effectively cope with stressful events through automatic adjustment of emotions, pain, negative cognition, etc., and is an important internal coping resource. Social-resourcefulness is an external resource, including formal and informal support. Studies have shown that social support is negatively correlated with maternal depression, which is consistent with the results of our study.

The mediating effect test shows that the level of resourcefulness of high-risk pregnant women plays a part of the mediating role between depression and self-care agency, which is in line with the expected hypothesis. In consistent with the study of Boonpongmanee et al(32), which reported that learned-resourcefulness mediates the effect of depressive symptoms on prenatal self-care of HIV-positive

pregnant women to a certain extent. The high-risk pregnant women with high resourcefulness can not only control negative emotions and cognition, but also treat diseases correctly, further development active self-direction and prenatal self-care to cope with depressive symptoms. The research of Zauszniewski et al. showed that resourcefulness can partially alleviate the influence of depressive symptoms on the health habits of women with type 2 diabetes, that is, resourcefulness training can promote their active health practices by reducing depression symptoms, such as focus shifting, progressive muscle relaxation training (PMR) and emotion regulation included in previous studies(33).

5 Limitations

This study has some limitations. First, the study has been carried out only in three hospitals in Lanzhou. Therefore, generalization of results has to be exercised with caution. Secondly, this study uses convenient samples and the causal relationship cannot be found. Third, the research was mainly conducted in a self-evaluation method, which will bias the results of the study.

6 Conclusions

The results of this study show that the effect of depression on self-care agency is mediated by resourcefulness. It is suggested improving the level of resourcefulness may enhance the ability of prenatal self-care. Nurses should provide effective self-care counseling services for women with high-risk pregnancy.

Declarations

Ethics approval and consent to participate

This study was approved by the Medical Ethics Committee of the School of Nursing of Lanzhou University (The committee's reference number is HLLL20210530), and the informed consent was carried out in accordance with the Declaration of Helsinki. The method is detailed in the statement attached to the relevant files.

Consent to participate

We had obtained from the research object for written informed consent.

Availability of data and materials

Data sharing is not applicable to this article as no datasets were generated or analysed during the current study.

Competing interests

The authors declare that they have no competing interests.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Authors' contributions

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by YW, KZ and HT. The first draft of the manuscript was written by KZ and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Acknowledgements Not applicable

References

1. Alkema L, Chou D, Hogan D, Zhang S, Moller AB, Gemmill A, et al. Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: a systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group. *Lancet*. 2016.
2. Borba RP, Fonseca ZC, Amaury C, Botelho SE. Special features of high-risk pregnancies as factors in development of mental distress: a review. *Trends in Psychiatry & Psychotherapy*. 2016;38(3):136.
3. King N, Chambers J, O'Donnell K, Jayaweera SR, Williamson C, Glover VA. Anxiety, depression and saliva cortisol in women with a medical disorder during pregnancy. *Archives of Womens Mental Health*. 2010;13(4):339 – 45.
4. Fei LI, Huang ML, Zeng YC, Fang XM, Nursing SO, University GP, et al. Influence Factors of Postpartum Depression in High-risk Pregnant Women. *Journal of Nursing(China)*. 2017.
5. Dagklis T, Papazisis G, Tsakiridis I, Chouliara F, Mamopoulos A, Rousso D. Prevalence of antenatal depression and associated factors among pregnant women hospitalized in a high-risk pregnancy unit in Greece. *Social Psychiatry and Psychiatric Epidemiology*. 2016;51(7):1025-31.
6. Brandon AR, Trivedi MH, Hynan LS, Miltenberger PD, Stringer CA. Prenatal depression in women hospitalized for obstetric risk. *J Clin Psychiatry*. 2008;69(4):635 – 43.
7. Adouard F, Glangeaud-Freudenthal N, Golse B. Validation of the Edinburgh postnatal depression scale (EPDS) in a sample of women with high-risk pregnancies in France. *Archives of Women's Mental Health*. 2005;8(2):89–95.
8. Grote NK, Bridge JA, Gavin AR, Melville JL, Iyengar S, Katon WJ. A meta-analysis of depression during pregnancy and the risk of preterm birth, low birth weight, and intrauterine growth restriction. *Archives of General Psychiatry*. 2010;67(10):1012.
9. Davalos DB, Yadon CA, Tregellas HC. Untreated prenatal maternal depression and the potential risks to offspring: a review. *Archives of Womens Mental Health*. 2012;15(1):1–14.

10. O'Donnell KJ, Glover V, Barker ED, O'Connor TG. The persisting effect of maternal mood in pregnancy on childhood psychopathology. *Development and Psychopathology*. 2014;26(2):1–11.
11. Zheng QC. Study on the Status of Self-Care Ability and Itsinfluencing Factors in the Puerperium of Primipara: Hunan Normal University; 2020.
12. Orem DE. *Nursings; Concepts of Practice*. AJN. 1986.
13. Kav S, Yilmaz AA, Bulut Y, Dogan N. Self-efficacy, depression and self-care activities of people with type 2 diabetes in Turkey. *Collegian*. 2014;24(1):27–35.
14. Boonpongmanee C. Resourcefulness and Self-Care in Pregnant Women With HIV. *Western Journal of Nursing Research*. 2003;25(1).
15. Ngai FW, Chan WC, Ip WY. The effects of a childbirth psychoeducation program on learned resourcefulness, maternal role competence and perinatal depression: A quasi-experiment. *International Journal of Nursing Studies*. 2009;46(10):1298 – 306.
16. Choi NG, Marti CN, Bruce ML, Hegel MT. Depression in Homebound Older Adults: Problem-Solving Therapy and Personal and Social Resourcefulness. *Behavior Therapy*. 2013;44(3):489–500.
17. Zauszniewski JA, Lai CY, Tithiphontumrong S. Development and testing of the Resourcefulness Scale for Older Adults. *Journal of Nursing Measurement*. 2006;14(1):-.
18. Xi KE, Wu MH, Liu YQ, He XH, Lin MR, Yang HQ, et al. Reliability and validity analysis of Chinese Resourcefulness Scale. *Chiense Journal Of Modern Nursing*. 2015;000(015):1737-40.
19. Wittkamp KA, Naeije L, Schene AH, Huyser J, Weert HCv. Diagnostic accuracy of the mood module of the Patient Health Questionnaire: a systematic review. *General Hospital Psychiatry*. 2007;29(5).
20. L SR, K K, B WJ. Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. *Primary Care Evaluation of Mental Disorders. Patient Health Questionnaire*. JAMA. 1999;282(18).
21. Kroenke K, Spitzer RL, Williams J. The PHQ-9: validity of a brief depression severity measure. *Journal of General Internal Medicine*. 2001;16(9):606 – 13.
22. Denyes M. Development of an instrument to measure self-care agency in adolescents. *Dissertation Abstracts International*. 1980;41.
23. Laffrey SC. preliminary development and testing of instruments to measure self-care agency and social support of women in taiwan. *Kaohsiung Journal of Medical ences*. 2000;16(9):459 – 67.
24. Barbara, Y., Kearney, Barbara, J., Fleischer. Development of an Instrument to Measure Exercise of Self-care Agency. *Research in Nursing & Health*. 1979.
25. Hao Z, Long L. Statistical Remedies for Common Method Biases. *Advances in Psychological Science*. 2004.
26. Zhonglin W, Baojuan Y. Analyses of Mediating Effects: The Development of Methods and Models. *Advances in Psychological Science*. 2014;22(05):731 – 45.
27. He XF, Gao LL, Bu XQ, Wu YR, Huang ST. Status and influencing factors of learned resourcefulness in pregnant women. *Chinese Journal Of Practical Nursing*. 2014;30(11):65 – 7.

28. Katz RC, Singh N. A comparison of current smokers and self-cured quitters on Rosenbaum's Self Control Schedule. Addictive Behaviors. 1986;11(1):63 – 5.
29. Zauszniewski JA, Chung CW. Resourcefulness and health practices of diabetic women. Research in Nursing & Health. 2001;24(2):113 – 21.
30. Rosenthal GRLBS. Prognostic indicators of success or relapse in weight reduction. International Journal of Eating Disorders. 1984;3(4):15–24.
31. Endler NS, Parker JD. Multidimensional Assessment of Coping. Journal of Personality & Social Psychology. 1990;58(5):844 – 54.
32. Boonpongmanee C, Zauszniewski JA, Morris DL. Resourcefulness and self-care in pregnant women with HIV. West J Nurs Res. 2003;25(1):75–92.
33. Hou YM, Hu PC. Application of progressive muscle relaxation in the clinical treatment for mental diseases. Journal of Clinical Rehabilitative Tissue Engineering Research. 2008;12(7):1331-6.

Figures

Figure 1

A fitting model of resourcefulness structure