Effect of WeChat Home-based Postpartum Exercise Program in Alleviating Postpartum Blues and Postpartum Depression of Advanced Maternal Age

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Abstract

Recent estimates indicate that approximately 10-15% of women giving birth experience depression during the postpartum period. Postpartum changes bring a great psychological burden to many women. If not solved in time, many families will fall into emotional difficulties. Exercise during the postpartum period has been linked to improved mood. This study concluded from the data collection and mathematical analysis of the Edinburgh Postpartum Depression Scale (EPDS) scores of elderly mothers before and after the experiment, that home-based exercise through WeChat was effective in improving adverse mood and reducing the harmful effects of postpartum depression in AMA mothers recovering from normal deliveries. This study also confirms that postpartum depression can be improved and EPDS scores can be reduced in normal older women through professional targeted use of the WeChat public platform as an at-home dissemination and guidance for postpartum exercise. In conclusion, WeChat-guided postpartum exercise at home has beneficial effects on reducing postpartum depression.

Keywords: *Home-based Postpartum Exercise Program, Advance Maternal Age (AMA) mothers, Postpartum Depression, EPDS*

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Introduction

Recent estimates indicate that approximately 10-15% of women giving birth experience depression during the postpartum period. According to the Royal College of Obstetricians and Gynecologists (RCOG, 2011), Advanced Maternal Age (AMA) is defined as childbearing in a woman over 35 years of age and is a growing trend within high-income countries. In recent years, with the development of the social economy and the popularization of the concept of late marriage and late childbirth, the proportion of AMA primipara in China has increased yearly, and the number of elderly pregnant women have reached about 20% of the total number of pregnant women (Zhang, 2016).

Postpartum changes bring a great psychological burden to many women. If not solved in time, many families will fall into emotional difficulties. Postpartum depression (PPD) is a significant public health problem that affects approximately 13% of women within a year of childbirth. Therefore, it is of great importance to strengthen the postpartum care of advanced maternal-age women. AMA women are more likely to have negative emotions such as postpartum anxiety and depression. This is due to different factors such as age and physical condition, which directly affect their postpartum physical rehabilitation, and in severe cases, their quality of life. It has become a serious public health event that people need to pay more attention to. As far as China is concerned, WeChat has become a relatively popular communication method at present. Research shows that WeChat can be applied to hospital education, school education, and health education for various chronic diseases like health education for diabetics (Chen et al., 2020), and WeChat-based teaching for an immersion cultural exchange program (Huang, X., 2019).

Some studies have shown that home-based exercise can reduce physical and mental fatigue in postpartum depressed women (Maria et al., 2008). Some studies support yoga as a promising complementary therapy for PPD and warrant large-scale replication studies (Buttner et al., 2015). Studies show that calisthenics can effectively improve the cardiopulmonary function of the human body and reduce the body weight and body fat of the subjects. It has a beneficial effect on weight loss. Therefore, the advantages and disadvantages of these two sports can complement each other and the combination of the two can make the exercise effect achieve a better state (Xu, 2016). At present, there are many studies on the fitness efficacy of calisthenics and yoga. However, there are no studies that show the effect of yoga and aerobics combined with at-home exercise workouts via Microsoft on postpartum depression.

There is relatively little research regarding the impact of guidelines on using the WeChat platform, including home visiting on the prevention and treatment of PPB and PPD. Due to the limited time in educating puerperal women in the hospital, the

implementation of health 4 education through WeChat can be utilized instead to enable new mothers to timely and effectively acquire relevant knowledge pertinent to motherhood.

At present, with the increase in the number of elderly mothers in China, the tendency of postpartum depression in elderly mothers is in urgent need of attention. There are many studies on medications and other treatments for postpartum depression, while there is also a gap in the research on home exercise through.

WeChat for AMA mothers. Therefore, this paper attempts to combine the use of home exercises and WeChat guidance to test the effect of home exercises via WeChat on the improvement of postpartum depression in AMA mothers. This study was conducted to understand whether the application of WeChat home exercises on top of routine postpartum health education could reduce postpartum depression in AMA mothers.

Methods

This research used the quasi-experimental research design. Quasi-experiments are studies that aim to evaluate interventions that do not use randomization. Similar to randomized trials, quasi-experiments aim to demonstrate causality between an intervention and an outcome. In medical informatics, the quasi-experimental, sometimes called the pre-post intervention design is often used to evaluate the benefits of specific interventions. The increasing capacity of healthcare institutions to collect routine clinical data has led to the growing use of quasi-experimental study designs in the field of medical informatics as well as in other medical disciplines (Harris, A. D., 2006). A quasi-experimental design aims to establish a cause-and-effect relationship between an independent and dependent variable. The study has been conducted at Liao Cheng Shandong, China, from February 2021 until March 2021. All subjects will be asked to sign an informed consent. The participants of this study include 80 AMA women (advanced age >35 years) in the postpartum period (1–24 weeks) experiencing symptoms, with a score from 9 to 13 on the EPDS. The participants for this study were purposively selected through convenience sampling based on the eligibility criteria.

The inclusion criteria for the participants are as follows:

Advanced Maternal Age >35 years

EPDS score from 9 to 13

Full-term normal delivery

Vaginal delivery with no abnormalities found in prenatal fetal heart monitoring, amniotic fluid, and placental examination

Able to master the communication tools of WeChat

No pregnancy complications

Voluntary participation in this study.

The exclusion criteria for the participants are as follows:

Refusal to cooperate
History of mental illness
Multiple pregnancies
Disorders of the brain, heart, liver, kidneys, and other vital organs
EPDS score less than 9, and more than 13

There was no statistical difference in the age and educational level of the two groups (P > 0.05) indicating comparability. All subjects signed an informed consent before the conduct of the study.

A non-probability sampling design was used. The convenience sampling and snowball sampling techniques were employed. A convenience sample is a type of non-probability sampling method where the sample is taken from a group of people who are easy to contact and reach. The researcher scouted for potential participants who passed the criteria. In this study, the researcher had purposefully selected an appropriate number of target populations from communities or hospitals that had readily met the inclusion criteria. A sample of 80 AMA women were purposively selected.

Table 1 *Characteristics of Participants in this Study EDPS*

	Mean (SD)	
	Exercise(n=40)	Control(n=40)
Demographics		
Age (years)	36.6	37.15
Education	University	University
Fertility status	Primiparity	Primiparity

In this study, the main data-gathering instrument is the Validated Mandarin Chinese version of the EPDS questionnaire. The Chinese version of the Cronbach's α coefficient was 0.76 (Guo et al., 2009). The scale utilized was a self-rating scale with 10 items. It was scored by 0-3 points and has 4 grades. The maximum score is 30. Possible Depression: 10 or greater. The higher the score, the more serious the depression. Mothers who score above 13 are likely to be suffering from a depressive illness of varying severity.

After the clinical data is collected, the purpose and significance of this study are first explained to the respondents. After consent is obtained, the Chinese version of the Edinburgh Postpartum Depression self-test scale is distributed to pregnant women

through WeChat, which is required to be completed and submitted back to the researcher within 30 minutes. The researcher observed the results with integrity.

Table 2 *EPDS Scoring*

EPDS Scoring	
Score	Verbal Interpretation
0-9	Normal
10 or greater	Possible Depression
Always look at item 10	(Suicidal thoughts)

The data collection procedures will be the same for the two groups. 21 Descriptive statistics will be used to compare the baseline characteristics of the two randomization groups. IBM SPSS 22.0 will be used to analyze the data. The patients' depression scores will be analyzed by using the Chi-square.

Data Collection Procedure

Phase 1 - Securing Approval

The researcher will seek approval from the FEU - Ethical Review Committee and the approval of the hospital to conduct the research study.

Phase 2 - Selecting the Respondents

The convenience sampling and snowball sampling techniques was utilized in the selection of the respondents based on the inclusion and exclusion criteria set by the researcher. The researcher explained the content of the consent form and the purpose of the study to the mothers who were qualified and had agreed to participate in this study. Information relevant to the study was provided to the participants to allow them to make a voluntary decision to participate as a research subject.

Phase 3 - Classification

Participants were randomly divided into two groups by choosing numbers.

Phase 4 - Intervention Phase

In this study, different interventions were conducted for the experimental and control groups. The experimental group underwent a combination of postpartum aerobic exercise and a yoga fitness program through Microsoft home intervention. While the control group did not undergo any exercise intervention.

Phase 5 - Collection of Data

Participants signed the consent form, followed by filling out the demographic characteristics sheet and other questionnaires. The questionnaires will be answered in the presence of the researcher to provide them with assistance should there be any

queries during the data gathering process which was conducted at the Liao Cheng Maternal-Child Health Center.

Phase 6 - Data Analysis

First, the researcher collated the data from the questionnaires accomplished by the participants and used SPSS to process the data using statistical tests to analyze the results that were obtained.

Statistical Treatment of Data

Data analysis was performed using both descriptive and inferential statistics. EpiData 3.1 software was used for database establishment and data entry, while IBM SPSS 22.0 was used for statistical analysis of the data.

Results

1. Demographic Information

A random grouping method was adopted; 80 questionnaires were distributed and 80 valid questionnaires were collected with an effective recovery of 100%. The results are shown in Table 3.

Table 3 *Demographic Information of the Respondents*

Variable	Frequency	Percentage
Age		
35	13	16.3
36	16	20.0
37	28	35.0
38	16	20.0
39	5	6.3
40	2	2.5
Total	80	100.0
Fertility		
Multiparity	39	48.8
Primiparity	41	51.3
Total	80	100.0
Education attainment		
Middle school	6	7.5
High school	19	23.8
University	53	66.3
Master	2	2.5

Occupation		
Blue Collar	26	32.5
Pink Collar	8	10.0
White Collar	46	57.5
Total	80	100.0

Table 3 shows the number and percentage of the eighty (80) respondents in terms of age, fertility status, educational attainment, and occupation. Eighty (80) participants were between the ages of 35 and 40 years old, which means that all the respondents were of advanced maternal age (AMA). Table 3 also shows that the largest frequency and percentage of participants with an education level of university are fifty-three (34) or 66.3%. Whereas two (2) or 2.5% of the participants have a master's degree. A

Table 4 *Result of the EPDS scores of the control group and experimental group before treatment*

Group	N	Mean	SD
Control Group	40	10.0500	1.43133
Experimental Group	40	10.0250	1.54401

The researchers used the mean score and standard deviation to answer the second research question. Table 3 answered the second research question which is about the EPDS scores of the control group and experimental group before the intervention. As shown in table 3. Cox et al., (1987), stated that postpartum depression can be diagnosed on a scale from 9 to 13. A score of 13 or higher was considered indicative of a severe case of postpartum depression. According to the EPDS scores shown in Table 4, both participants in the control and experimental groups have postpartum depression.

Table 5 *Result of the EPDS score of the control group and experimental group after treatment*

Group	N	Mean	SD
Control Group	40	10.6250	1.21291
Experimental Group	40	5.6250	1.54733

The EPDS score of the control group after the intervention was 10.0500, which was interpreted as a high score. While the EPDS score of the experimental group after the intervention was 5.6250, which was interpreted as a low score. The EPDS score of the control group after treatment was 10.6250 with a standard deviation of 1.21291, whereas the EPDS score of the experimental group after treatment was 5.6250 with a standard deviation of 1.54733. According to Cox et al., (1987), participants in control group still have symptoms of postpartum depression, while participants in the exercise group can be considered as recovered.

Table 6 *Result on the significant difference in EPDS score in the pretest of the control group and experimental group before the treatment*

	Mean	SD	Sig. (2-tailed)
Pre-Test	5.000	0.311	0.940

Set $\alpha = 0.05$. $P < 0.05$ will be considered as statistically significant.

Table 6 shows the significant difference in the EDPS scores between the control and the experimental groups before the treatment. The mean score was 5.000 with a standard deviation of 0.311, with a p-value of 0.940, and 0.05 level difference being statistically significant. The findings showed that there was not a significant difference in the EPDS scores of the experimental group and the control group before receiving the home-based exercise training. According to the results of the questionnaire, most of the mothers had postpartum depression after delivery, which is consistent with the estimates of recent studies.

Table 7 *Result on the significant difference in EPDS score in the pretest of the control group and experimental group after the treatment*

	Mean	SD	Sig. (2-tailed)
Post-Test	-5.000	0.311	0.0000017

Set $\alpha = 0.05$. $P < 0.05$ will be considered as statistically significant.

Table 7 shows the significant difference in the EPDS scores between the control and experimental groups after the treatment. The mean score was -5.000 with a standard deviation of 0.311, with a p-value of 0.0000017, and 0.05 level difference being statistically significant. The findings showed that there was a significant difference in the EPDS scores of the experimental group and the control group after receiving the home-based home exercise training.

Table 8 *Result on the significant difference between the pretest and post-test EPDS scores of the control and the experimental groups*

Pretest - Post-Test	Mean	SD	T	Sig. (2-tailed)
Control Group	.57500	1.48302	-2.452	0.19
Experimental Group	4.4000	1.12774	24.676	0.0000208

Set $\alpha = 0.05$. $P < 0.05$ will be considered as statistically significant.

Based on the data presented on Table 8, the t-value of the paired t-test between the pretest scores and post-test scores of the control group was -2.452, and the probability of p-value was 0.19, which was greater than 0.05 at the significance level. Therefore, the original hypothesis was rejected, and it was concluded that there was no significant difference between the pretest scores and post-test scores of the control group.

Analysis

After four weeks of intervention, the EPDS scores of the control group of senior mothers were all higher than those of the experimental group, indicating that instructing senior mothers with a tendency of postpartum depression to perform exercise at home through WeChat, can effectively alleviate postpartum depression and reduce EDPS scores. This also indicates that the experimental group has better control of depression level than the control group. It fully verifies that the implementation of this exercise program can improve the current situation of the participants' bad mood and unstable psychological state. It created a relaxed atmosphere for them to perform more appropriate exercises, eliminating tension and worries, calming the body and mind, and promoting the development of psychological health in normal delivery of elderly mothers.

Conclusion

This study concluded from the data collection and mathematical analysis of the Edinburgh Postpartum Depression Scale (EPDS) scores of elderly mothers before and after the experiment, that home-based exercise through WeChat was effective in improving adverse mood and reducing the harmful effects of postpartum depression in AMA mothers recovering from normal deliveries.

The study also confirmed that postpartum depression can be improved and EPDS scores can be reduced through professionally targeted use of the WeChat public platform as a way to disseminate and guide postpartum exercises at home. Taken together, these findings suggest that postpartum at-home exercises guided by WeChat

have a beneficial effect on reducing postpartum depression and decreasing the Edinburgh Depression Scale (EPDS) scores of older women.

The innovation of this study involves the full use of modern interpersonal communication media to implement instruction on postpartum home exercises and provide an effective platform for training and instruction.

Based on the findings and conclusions presented and discussed, the following recommendations are suggested:

1. Due to the limitation on the scope of this study, the subjects were only limited to the city of Liao Cheng for postpartum home exercise guidance based on WeChat. Whether this can be extended to other areas remains to be further investigated. This study only compared the use of WeChat-based at-home exercise intervention for advanced maternal age within 30 days. Postpartum changes in maternal mood and psychological status will change over time as labor progresses. If conditions permit, further and longer intervention studies could be conducted.
2. Due to the substantial number of questionnaire items and the long duration of the survey, subjects may not be able to give the most accurate answers due to physical, emotional, or other reasons. The scale may be more accurate if it can be combined with relevant objective indicators for evaluation in future studies.
3. Although WeChat has many users in Asia, it is still not well known in Western countries, and the feasibility of using WeChat as a primary tool for postpartum exercise interventions in advanced maternal age needs to be further investigated in Western countries.
4. The results may vary due to the participants' physical conditions and different levels of family support.

AUTHOR INFORMATION

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