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ABOUT COVER

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Retrospective Study

Postpartum quality of life and mental health in women with heart disease: Integrated clinical communication and treatment

Jia-Lin Liu, Qi Wang, Dong-Ying Qu

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2021122111@cmu.edu.cn**Abstract****BACKGROUND**

Postpartum quality of life (QoL) in women with heart disease has been neglected.

AIM

To improve clinical communication and treatment, we integrated medical data and subjective characteristics to study postpartum QoL concerns.

METHODS

The study assessed QoL 6 wk after birth using the 12-Item Short-Form Health Survey. The Edinburgh Postnatal Depression Scale, Cardiac Anxiety Questionnaire, European Heart Failure Self-Care Behavior Scale, and a self-designed questionnaire based on earlier research were also used to assess patient characteristics. Patient data were collected. Prediction models were created using multiple linear regression.

RESULTSThis retrospective study examined postpartum QoL in 105 cardiac patients. Postpartum QoL scores were lower (90.69 ± 13.82) than those of women without heart disease, with physical component scores (41.09 ± 9.91) lower than mental component scores (49.60 ± 14.87). Postpartum depression (33.3%), moderate anxiety (37.14%), pregnancy concerns (57.14%), offspring heart problems (57.14%), and life expectancy worries (48.6%) were all prevalent. No previous cardiac surgery, multiparity, higher sadness and cardiac anxiety, and fear of unfavorable

pregnancy outcomes were strongly related to lower QoL ($R^2 = 0.525$).

CONCLUSION

Postpartum QoL is linked to physical and mental health in women with heart disease. Our study emphasizes the need for healthcare workers to recognize the unique characteristics of these women while developing and implementing comprehensive management approaches during their maternity care.

Key Words: Heart disease; Pregnancy; Postpartum; Quality of life; Mental health

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Core Tip: This study illuminates the intimate connection between quality of life (QoL) and physical and psychological well-being in postpartum women with cardiac conditions. Results showed lower postpartum QoL scores, including higher depression and cardiac anxiety, and worry about adverse pregnancy outcomes. Thus, healthcare providers must recognize their unique features when developing and implementing comprehensive obstetric care plans for these women.

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INTRODUCTION

Heart disease during pregnancy includes pre-existing or newly diagnosed congenital heart disease, pulmonary hypertension, aortic disease, valvular heart disease, coronary artery disease, cardiomyopathy, heart failure, and arrhythmias[1]. It complicates 1%-4% of pregnancies and accounts for 15% of maternal deaths[2]. Due to the rise in the proportion of high-risk individuals in the modified World Health Organization (WHO) pregnancy risk classification, cardiovascular disease has become the leading cause of maternal mortality worldwide[2].

Women with heart disease experience pregnancies with a 1% mortality rate, which is 100 times higher than those without heart disease[3]. Dramatic hemodynamic changes during pregnancy-increased blood volume and cardiac output, contractions and pain during delivery, and postpartum inferior vena cava reflux[4] increase the heart burden and worsen heart failure symptoms. Strict multidisciplinary team management (MDT) is needed, resulting in increased obstetric examinations and hospitalizations throughout pregnancy for 25% of affected women[3]. Compared to women without heart disease, women with heart disease are more likely to experience pregnancy comorbidities, cesarean section rates, unfavorable pregnancy outcome, neonatal preterm delivery and complications, and shorter gestational periods[2,3,5].

In addition, these women suffer notable psychological stress. Following a diagnosis, they desire to parent[6-11] but lack autonomy and control over pregnancy decisions[7,12]. When experiencing cardiac symptoms during and after pregnancy, they feel helpless, isolated, frightened, and vulnerable[7,10,11,13-15], wondering about their safety and their children's health and care[6-8,10-12,16]. With complex diagnoses, people struggle to comprehend their illness fully and precisely[6,8,9,16], rely heavily on medical institutions and personnel[6,11,16], and demand more social support[7,11,16,17]. They suffer physical and psychological deterioration due to prognostic uncertainty and the complexity of pregnancy, delivery, and postpartum rehabilitation. Long-term effects include poorer quality of life (QoL), impaired postpartum recovery, heart disease self-management challenges, compromised mother-infant relationships, increased illness burden, and family and social issues[15,16]. Guidelines emphasize the importance of MDT management and continuous close care during and after pregnancy for women with heart disease[1,18]. This approach ensures safe pregnancies and seamless transitions, requiring strong cooperation with patients and their families[19]. These women need good medical care throughout pregnancy, delivery, and postpartum recovery[7,16,17].

Compared to their healthy peers, women with heart disease during and after pregnancy had a reduced QoL[20-22], as well as physical discomfort and mental health problems[14,15,20-23]. These issues result in decreased adherence and bad healthcare practices[10,21,23]. Existing research focuses on the clinical and physiological outcomes of these pregnancies [21,24]. However, it lacks comprehensive subjective and objective data on patients' health lists, heart disease, and emotional-psychological effects on postpartum QoL[21,24]. Moreover, there are inadequate assessments of the factors influencing postpartum QoL. Due to the unique characteristics of these women, web-based patient data are often collected long after delivery, which may not accurately reflect the crucial short-term postpartum transition period. In addition, the healthcare system continues to fall short of meeting the needs of women experiencing high-risk pregnancies [13].

This study examined the postpartum QoL of women with heart disease about their demographic, clinical and pregnancy features and self-reported mental health status. Furthermore, the study aimed to explore the factors influencing healthcare professionals' (HCPs) knowledge of physical and mental health in women with high-risk pregnancies. This information seeks to improve two-way communication and provide a reference for patient-centered

continuous MDT management during and after pregnancy.

MATERIALS AND METHODS

Study protocol

Patients from the Maternal Cardiology Consultation Center of The General Hospital of Northern Theater were chosen for this cross-sectional retrospective study. Between March 2021 and March 2023, these patients received MDT consultations and successfully gave birth. Six weeks postpartum, participants completed an electronic version of the questionnaire, and study staff was quickly accessible for consultation in case of data loss.

Participants

Inclusion criteria: (1) Pregnant women diagnosed with heart disease according to the 2018 European Society of Cardiology Guidelines[1]; (2) delivered one or more infants after 20 wk of gestation with a minimum birth weight of 400 g; (3) ≥ 18 years of age; and (4) adequate physical, cognitive and linguistic abilities to complete the self-report questionnaire. Exclusion criteria: (1) Prior history of mental illness or current use of psychotropic drugs; (2) multiple pregnancies; and (3) primary diagnosis involving immunological, renal, or respiratory disorders other than heart disease.

Measurement

We obtained demographic, clinical and pregnancy variables from the hospital information system. In addition, participants completed the Chinese versions of the Edinburgh Postnatal Depression Scale (EPDS), Cardiac Anxiety Questionnaire (CAQ), European Heart Failure Self-Care Behavior Scale (EHFScBS), and 12-Item Short-Form Health Survey (SF-12) at 6 wk postpartum. We also developed a questionnaire consisting of seven items on patient compliance, understanding of their condition, and worries linked to heart disease based on data from prior studies[20-22].

Postpartum depression

Postpartum depression is a major depressive episode within 6 wk of delivery[25]. EPDS is a well-known and authoritative screening instrument for postpartum depression, renowned for its simplicity and validity in worldwide settings [26]. Higher scores imply more severe depressive symptoms[27]. The Chinese version of the EPDS recommends a score of 10 as indicative of depressive symptoms[28]. In our study, a more alert threshold of 13 implied potential postpartum depression (sensitivity range from 0.67 to 1.0 and specificity ≥ 0.87)[27,29]. The measure showed high internal consistency with a Cronbach's α of 0.845.

Heart-focused anxiety

Heart-focused anxiety (HFA) is distinguished from general anxiety by the fear of heart-related sensations, avoidance of symptom-caused activities, and obsession with heart-related symptoms[30]. The CAQ, the most widely used scale for assessing HFA in clinical settings, has shown solid psychometric features across multiple nations and groups, including those with and without heart disease[31]. The CAQ consists of 18 items corresponding to the definition of HFA and three subscales (fear, avoidance, and heart-focused attention), each assessed on a 5-point Likert scale (ranging from 0 to 4). The total and subscale scores are averaged, with higher scores indicating a more severe HFA. Currently, there are no established clinical cutoff scores for this metric[30]. This study displayed strong internal consistency (Cronbach's $\alpha = 0.909$).

Medical behavior adherence

Self-management comprises the decisions and strategies individuals use to maintain life, promote healthy functioning, and enhance well-being, and it has a significant role in enhancing the prognosis of heart failure patients[32]. The EHFScBS measures heart failure-related self-care behaviors recommended by American Heart Association guidelines for secondary prevention, including medication adherence, dietary management, exercise, symptom monitoring, and aid-seeking[32]. There are 12 items, and each scored on a 5-point Likert scale ranging from 1 to 5[32]. Higher scores denote poorer self-care[32]. The instrument exhibits solid internal consistency, as evidenced by a Cronbach's α of 0.880.

QoL

QoL assesses physical, mental and social well-being and can help diagnose diseases and improve patient-clinician communication[33]. QoL is commonly measured using the SF-36 Health Survey[34]. The abridged SF-12, which has strong reliability and validity, was used in this investigation[35]. The SF-12 has two subscales, Physical Component Summary (PCS) and Mental Component Summary (MCS), with each total score ranging from 0 to 100, and 12 items with minimal information loss compared to the SF-36[36]. These subscales include eight dimensions of general health, physical functioning, role-physical, bodily pain, vitality, social functioning, role-emotional and mental health. Higher total scores imply better functioning in this rating[36]. Chinese people had mean SF-12 PCS and MCS scores of 50.2 and 48.4, respectively[37]. Cronbach's α was 0.808, indicating excellent internal consistency.

Statistical methods

Our study needed at least 63 women[38]. Appendix A provides sample size calculations. Categorical data were expressed as percentages and continuous numerical variables were expressed as ranges, means \pm SDs, and median \pm interquartile

ranges. Correlations between continuous numerical variables (*e.g.*, gestational age, gestational weeks, newborn weight, EPDS, CAQ and EHFScBS) and SF-12 were determined using Pearson or Spearman coefficients.

Other potential physical and psychological factors were identified using univariate analysis utilizing the independent *t* test and ANOVA, followed by least significant difference *post hoc* testing. To include as many potential risk factors as possible in the linear regression model, we performed a multivariate analysis of variance with a *P* threshold of 0.10. Variables were manually screened based on their *P* values, and residual analyses were used to assess independence, normality, and homoscedasticity.

The Durbin-Watson (D-W) test was applied to further examine independence, while the variance inflation factor (VIF) and tolerance statistics were used to assess collinearity. All occurring *P* values and tests were conducted on a two-sided basis. *P* < 0.05 indicated statistical significance. SPSS Statistics 27.0 (SPSS Inc., Chicago, IL, United States) was utilized.

RESULTS

Participants

We sent out electronic questionnaires to 162 women who met the criteria and received 130 responses (participation rate of 80.25%); of which, 15 were excluded due to a lack of clarification regarding the diagnosis of heart disease during the postpartum review. Finally, 105 postnatal individuals with various heart diseases were included (Appendix B).

Objective medical characteristics and postpartum QoL

Most women with heart disease were aged 25-34 years. These women typically had a high level of education and income (> 80000 RMB), and they either did not work or worked less during pregnancy (Table 1). We examined the association between the demographic characteristics of women with heart disease and their QoL following childbirth. None of these factors were found to impact postpartum QoL in our patient population.

The findings of clinical features are reported in Table 2. Most patients were of average weight and were newly diagnosed with structural heart disease. The postpartum QoL of patients who underwent heart surgery was superior (*P* = 0.007). We classified patients using the New York Heart Association (NYHA) and modified WHO pregnancy risk classifications. Patients with worse heart function had lower postpartum QoL scores (*P* < 0.001). Those with modified WHO pregnancy risk severity grades II or III had significantly poorer postpartum QoL than those with severity grades I or III (*P* = 0.003, *P* = 0.016, respectively). Other clinical considerations had no bearing on postpartum QoL.

Table 3 displays the features of these pregnancies. Most women were primipara without complications. We observed high rates of cesarean delivery (89.52%), short gestational weeks, and low newborn weight. Postpartum QoL was lower for multiparous than primiparous women (*P* = 0.026) and correlated positively with gestational weeks (*P* = 0.040). After birth, 35.24% of neonates required hospitalization, and their mothers' postpartum QoL was poorer (*P* = 0.037). Other pregnancy factors were unrelated to postpartum QoL.

Emotional and psychological characteristics, compliance, and postpartum QoL

Table 4 presents the key results for the EPDS, CAQ, EHFScBS and SF-12, revealing that 33.33% (score ≥ 13) of the women screened positive for postpartum depression, which is considerably higher than the rate of positive perinatal screening (50.47% *vs* 40%, score ≥ 10)[39]. The sample EPDS mean score was 10.08 ± 5.08, above the usual degree of postpartum depression in Chinese women (7.09 ± 4.41)[40].

A total of 37.14% of patients demonstrated at least moderate cardiac anxiety, with the highest heart-focused attention score (2.40 ± 1.34), followed by avoidance (1.59 ± 0.82) and fear (1.52 ± 0.73). The postnatal PCS score (41.09 ± 9.91) was significantly lower than the standard population level (50.2)[37], and the MCS score (49.60 ± 14.87) on the SF-12. The Pearson correlation coefficients among the EPDS, CAQ, EHFScBS and SF-12 were significant (-0.568, *P* < 0.001; -0.461, *P* < 0.001; and -0.215, *P* < 0.028, respectively).

The majority (61.90%) of patients had their recovery and cardiac status assessed in the hospital following delivery (Table 5). Over half (55.56%) of the patients who skipped medical appointments claimed family and childcare commitments. Some patients (39.05%) were advised against having children, and most (79.05%) acknowledged the complexity of heart disease diagnosis during pregnancy. A substantial proportion of patients with heart disease were concerned about unfavorable pregnancy outcomes (57.14%) and the risk of their children developing heart issues (57.14%), followed by concerns about how heart disease might affect their future life expectancy (48.57%). Those with poorer postpartum QoL (*P* < 0.05) voiced these concerns.

Determinants of postpartum QoL

We used *P* > 0.1 as the criterion for exclusion. Gestational age, prior cardiac surgery, heart disease type, modified WHO pregnancy risk classification, NYHA classification, primiparity status, gestational comorbidities, planned pregnancy, gestational weeks, neonatal weight and hospitalization, EPDS score, CAQ score, and EHFScBS score were selected for the model. Worries about fetus heart health, future life expectancy, and adverse pregnancy outcomes were also considered. After manual exclusion, the result of the linear regression model is given in Table 6. It highlights that prepregnancy cardiac surgery, CAQ, EPDS, fear of an unfavorable pregnancy, and primiparity can successfully explain the SF-12 scores (*P* < 0.001). The model fit the data well (adjusted *R*² = 0.525), and there was no evidence of linearity and normality violations in the residuals. The VIF ranged from 1.020 to 1.173, while tolerance statistics varied between 0.852 and 0.980. The D-W test showed adequate variance independence. Upon analyzing the SF-12 outcomes alongside both subjective

Table 1 Demographic characteristics and postpartum quality of life (mean \pm SD)

Variables	<i>n</i> (%)		<i>P</i> value
Gestational age, yr	31.00 \pm 5.0 (19.0-49.0) ¹		0.064
Gestational age, yr			0.266
< 25	8 (7.62)	97.78 \pm 9.00	
25-34	80 (76.19)	90.51 \pm 13.81	
\geq 35	17 (16.19)	88.21 \pm 15.29	
Education			0.915
No more than junior middle school	8 (7.62)	93.14 \pm 10.87	
Senior high school	13 (12.38)	87.84 \pm 15.43	
Junior college	24 (22.86)	91.86 \pm 12.98	
Bachelor degree	49 (46.67)	90.57 \pm 15.17	
Master's degree or above	11 (10.48)	90.27 \pm 10.35	
Annual household income, RMB			0.559
< 30k	14 (13.33)	94.56 \pm 13.24	
30k-80k	23 (21.90)	91.70 \pm 12.21	
80k-120k	25 (23.81)	88.66 \pm 16.69	
120k-200k	22 (20.95)	89.66 \pm 14.55	
200k-300k	15 (14.29)	93.00 \pm 9.55	
\geq 300k	6 (5.71)	92.58 \pm 15.15	
Work conditions during pregnancy			0.337
Did not work	43 (40.95)	90.78 \pm 13.53	
Reduced workload	34 (32.38)	88.27 \pm 15.47	
No change and increase in workload	28 (26.67)	93.49 \pm 11.96	

¹Median \pm interquartile range (range).

and objective predictors involved in the model, it was observed that prepregnancy heart surgery and reduced levels of pregnancy anxiety contributed to enhanced postpartum QoL. As EPDS scores increased, so did the value of SF-12. Similar results were observed when analyzing the CAQ variable. Additionally, postpartum QoL for primiparous women with heart disease was substantially enhanced.

DISCUSSION

Our research revealed that postpartum women with cardiac conditions typically exhibited compromised QoL and had significant physical and psychological stresses throughout their maternity journey. In addition, the deterioration of physical and mental health during and after pregnancy was substantially connected with the degree of QoL impairment these women with heart disease had. QoL is essential to postpartum recovery and secondary prevention for heart disease patients. Unlike HCPs, who prioritize clinical and physical outcomes such as mortality and mode of birth, these women and their families prioritize overall wellness[24]. Health includes physical, emotional, and role functioning, QoL, and care provision[24]. Nonetheless, many of them are dissatisfied with these qualities[15]. Following earlier research[15,20,21,41], our data suggested that postpartum QoL was generally diminished in women with heart disease. Some evidence indicates that the emotional burden of pregnancy and the postpartum period decreased over time, resulting in an increase in QoL[42] and beneficial physical and psychological results over the long run[22]. It has also been shown that persons with congenital heart disease who have children have higher health satisfaction, mental health, and social support scores [43]. However, some studies have reported that poor QoL and mental health outcomes after pregnancy may not necessarily improve beyond 6 wk postpartum[21,23]. As a result, these issues can be long-lasting and may not return to baseline mental and physical fitness levels[15]. Low QoL negatively affects the prognosis of heart failure patients, increases the incidence of adverse cardiac events[44], impedes postpartum recovery, and can damage mothers, newborns, families and society[15]. Consequently, QoL assessment should be critical in the ongoing clinical therapy of women with heart disease following pregnancy[23]. Additional prospective longitudinal studies and a greater focus on long-term

Table 2 Clinical characteristics and postpartum quality of life (mean \pm SD)

Variables	n (%)		P value
Prepregnant BMI (kg/m²)			0.408
< 18.5 (leaner)	12 (11.43)	90.64 \pm 13.90	
18.5-24.9 (normal)	69 (65.71)	91.84 \pm 14.57	
\geq 25 (overweight and obesity)	24 (22.86)	87.43 \pm 11.36	
BMI increment (kg/m²)	4.92 \pm 1.89 (-0.37 to 9.86) ¹		0.319
Pregnancy diagnosis			0.206
Yes	55 (52.38)	89.06 \pm 12.55	
No	50 (47.62)	92.49 \pm 15.02	
Prepregnant cardiac surgery			0.007 ^b
Yes	32 (30.48)	96.14 \pm 12.62	
No	73 (69.52)	88.30 \pm 13.73	
Type of heart disease			0.075
Structural	74 (70.48)	92.25 \pm 13.93	
Functional	31 (29.52)	86.98 \pm 13.03	
mWHO classification			0.026 ^a
I	25 (23.81)	96.05 \pm 13.48	
II	44 (41.90)	89.71 \pm 13.42	
II-III	9 (8.57)	80.42 \pm 14.64	
III	10 (9.52)	95.47 \pm 12.85	
IV	17 (16.19)	87.97 \pm 12.50	
NYHA classification			< 0.001 ^b
I	64 (60.95)	94.58 \pm 13.22	
II	33 (31.43)	87.01 \pm 12.13	
III, IV	8 (7.62)	74.78 \pm 10.11	

¹Mean \pm SD (range).^a*P* < 0.05.^b*P* < 0.01.

BMI: Body mass index; mWHO classification: modified World Health Organization pregnancy risk classification.

monitoring and management are also necessary for these women after birth.

Multiple linear regression was used to find significant characteristics of postpartum QoL in women with heart disease. Our findings demonstrated that prepregnancy heart surgery, parity, EPDS score, CAQ score, and fear of an unfavorable pregnancy throughout pregnancy were predictors of perceived postpartum QoL.

In the general cardiac population, cardiac surgery reflects the severity of the disease and is associated with a decline in QoL[43]. However, as predictors of postpartum QoL in cardiac patients, prepregnancy surgery was a positive factor for delivery, as recommended by guidelines[1,18]. In this study, prepregnancy cardiac operations included atrial septal defect repair (25.0%), ventricular septal defect repair (21.87%), mechanical valve replacement (21.87%), correction of tetralogy of Fallot (9.38%), and radiofrequency ablation (9.38%). These surgical patients, representing 64.0% (32/50 cases) of pre-conception diagnoses, underwent procedures before conception, improving cardiac function, physical state[45], pregnancy tolerance, and reducing the modified WHO pregnancy risk classification[46-48]. As a result, most of them had planned pregnancies and paid greater attention to cardiac treatment through close follow-up and stringent pregnancy management, which eventually improved pregnancy outcomes[49]. Our findings indicated the benefits of timely diagnosis and early surgical intervention on postpartum QoL.

Consistent with their counterparts without heart disease[50], primiparas had enhanced QoL at 6 wk postpartum in our study. Pregnancy generates numerous hemodynamic and physiological changes that increase cardiovascular stress, which is entirely reversed after delivery[51]. Extant research indicates that increasing parity harms women's health and elevates the risk of cardiovascular disease[52,53]. In addition, repeated cardiovascular adaptation to volume overload can lead to adverse cardiac remodeling, which is an independent risk factor for left ventricular diastolic dysfunction in

Table 3 Pregnancy characteristics and postpartum quality of life (mean ± SD)

Variables	n (%)		P value
Gravidity			0.524
1	64 (60.95)	90.26 ± 13.25	
2	27 (25.71)	89.69 ± 15.53	
≥ 3	14 (13.33)	94.58 ± 13.28	
Parity			0.026 ^a
Primiparas	91 (86.67)	91.86 ± 13.60	
Multiparas	14 (13.33)	83.09 ± 13.29	
Pregnancy complications			0.052
Yes	34 (32.38)	94.47 ± 12.90	
No	71 (67.62)	88.88 ± 13.97	
Planned pregnancy			0.085
Yes	69 (65.71)	92.37 ± 13.18	
No	36 (34.29)	84.48 ± 14.62	
Delivery method			0.529
Vaginal delivery	11 (10.48)	90.51 ± 14.77	
Cesarean section	80 (76.19)	92.18 ± 13.73	
Emergency cesarean section	14 (13.33)	87.40 ± 12.69	
Gestational weeks, d	264.00 ± 19.0 (225.0-285.0) ¹		0.040 ^a
Neonatal gender			0.079
Male	54 (51.43)	93.82 ± 13.66	
Female	51 (48.57)	88.78 ± 13.31	
Neonatal weight	2977.91 ± 591.63 (1640.0-4650.0) ²		0.097
Neonatal hospitalization			0.037 ^a
Yes	37 (35.24)	87.34 ± 14.57	
No	68 (64.76)	93.58 ± 12.72	
Milk-feeding way			0.965
Exclusive breastfeeding	40 (38.0)	91.02 ± 13.45	
Mixed feeding	43 (41.0)	91.38 ± 13.11	
Artificial feeding	22 (21.0)	92.07 ± 15.69	

¹Median ± interquartile range (range).

²Mean ± SD (range).

^a*P* < 0.05.

women with heart disease[54-56]. Although some studies have shown that women with heart disease have similar pregnancy outcomes in consecutive pregnancies[57], our results showed that repeated pregnancies reduced postpartum QoL. The condition underscores the importance of closely monitoring women's physical and mental health with multiple births after delivery.

Prior research has shown that the recovery of the cardiovascular system during the postpartum period does not correspond with emotional healing[15,23]. The physical limits and cognitive impairments caused by the disease substantially influence these women's lives, resulting in enduring emotional responses[42]. In our study, the prevalence of postpartum depression was 33.33%, similar to previous research on women with heart disease[22,23], twice that of the general Chinese population[58], and comparable to high-risk pregnancies[59]. Depressive disorders were identified as a potent predictor of postpartum QoL in our investigation, corroborating previous findings[41], and have also been demonstrated in the general postpartum population[60-62]. Depression is also associated with reduced health behaviors and exacerbating heart failure symptoms in mothers with heart disease[23]. We must focus on depression symptoms and intervene early to improve postpartum QoL and cardiovascular disease management.

Table 4 Descriptive statistics for the scales at 6 wk postpartum (mean ± SD)

Variables	Value	
EPDS	≤ 9	52 (49.52) ¹
	10-12	18 (17.14) ¹
	≥ 13	35 (33.33) ¹
	Total	10.08 ± 5.08
CAQ	≥ 2	39 (37.14) ¹
	Avoidance	1.59 ± 0.82
	Fear	1.52 ± 0.73
	Heart-focused attention	2.40 ± 1.34
	Total	1.79 ± 0.79
EHFScBS	Total	35.38 ± 10.51
SF-12	PCS	41.09 ± 9.91
	MCS	49.60 ± 14.87 ²
	Total	90.69 ± 13.82

¹*n* (%).²Median ± interquartile range.

EPDS: Edinburgh Postnatal Depression Scale; CAQ: Cardiac Anxiety Questionnaire; EHFScBS: European Heart Failure Self-Care Behavior Scale; SF-12: 12-Item Short-Form Health Survey; PCS: Physical components summary; MCS: Mental components summary.

In addition, HFA problems were common among our patients, resulting in a lower total CAQ score. The score was lower than that in Australian research of 43 women with cardiac disease during pregnancy and the postpartum period [21] and those with peripartum cardiomyopathy[20]. Lower scores may be because 65.71% of our patients were classified as modified WHO pregnancy risk class I and II. However, the score was considerably higher than that of the general population of women in the same age group[63], the postmyocardial infarction population[31], general cardiac patients [30], and individuals with noncardiac chest pain[64]. Prior research has also established a correlation between HFA and reduced QoL in heart disease patients, emphasizing the importance of routine diagnosis and intervention[64,65]. Such a phenomenon is akin to how general anxiety influences the QoL for the average woman during the postpartum period[61].

We also designed a standardized questionnaire, and the proportion of patients concerned about their child's heart problems is consistent with earlier research (57.7%-73.8%)[20-22]. Studies from developed countries showed that women with heart disease were more concerned about their physical health[20-22]. In contrast, our study found that more women with heart disease were concerned about their children acquiring cardiac conditions. They were considerably more likely than mothers in other countries to miss medical visits owing to child care (55.56% *vs* 10.7%-40.5%), highlighting cultural disparities. Prior research only offered descriptive statistics on these issues. However, our study incorporated these concerns into a multiple regression analysis, suggesting that women anxious about adverse pregnancy outcomes had lower postpartum QoL than their counterparts. Despite the importance of psychological factors on postpartum QoL, our results revealed that only 2.86% of the population sought psychological counseling, which was lower than that reported in developed countries[21] and comparable to general maternity trends in China[39]. The unpopularity of mental health care highlights the urgent need for HCPs to offer consultation and psychological support throughout pregnancy while ensuring continuity of care.

The following were potential limitations of our study. As an observational cross-sectional study, it cannot show causality but can serve as a basis for future research. Second, there was selection bias because the sample consisted of MDT consultation patients with more significant health literacy, and emotionally troubled patients might have refused to participate. Third, the small sample size, single-center design, and uneven participant distribution limit generalizability, despite diverse heart disease cases being included. Fourth, EPDS is a screening instrument rather than a gold standard for postpartum depression diagnosis. Finally, data on QoL and psychological status data were collected only 6 wk postpartum, without continued monitoring. Despite these limitations, this study provides valuable insights into the postpartum recovery of high-risk women and its implications for HCP care.

CONCLUSION

Our research revealed that women with heart disease typically experienced challenges during maternity. To improve their well-being, HCPs should recognize their specific requirements, offer education, improve communication, and provide psychological support. Creating individualized treatment strategies from pregnancy to postpartum can optimize

Table 5 Design-specific cardiac-related problems and quality of life at 6 wk postpartum (mean \pm SD)

Variables	N (%)		P value
Compliance			
Hospital review after ending the pregnancy			0.360
Yes	65 (61.90)	91.67 \pm 12.85	
No	40 (38.10)	89.11 \pm 15.31	
Understanding of the disease			
Advised to avoid having children			0.125
Yes	41 (39.05)	88.10 \pm 16.11	
No	64 (60.95)	92.35 \pm 11.98	
Full consultation and understanding of the diagnosis			0.947
Yes	83 (79.05)	90.64 \pm 14.36	
No	22 (20.95)	90.87 \pm 11.84	
Medical concerns			
Seek psychological counselling			0.907
Yes	3 (2.86)	89.77 \pm 15.92	
No	102 (97.14)	90.72 \pm 13.85	
Fear of a bad pregnancy			< 0.001 ^c
Yes	60 (57.14)	86.38 \pm 13.35	
No	45 (42.86)	96.44 \pm 12.39	
Worried about child's heart			0.016 ^a
Yes	60 (57.14)	87.89 \pm 13.76	
No	45 (42.86)	94.42 \pm 13.14	
Worried about reduced longevity			0.007 ^b
Yes	51 (48.57)	86.96 \pm 14.16	
No	54 (51.43)	94.22 \pm 12.63	

^a*P* < 0.05.^b*P* < 0.01.^c*P* < 0.001.**Table 6** Linear regression model results for the 12-Item Short-Form Health Survey

Predictors	β	Standard error	<i>t</i>	<i>P</i> value	95% confidence interval for β
Constant	127.304	6.431	19.795	< 0.001	114.543 to 140.065
Without prepregnant cardiac surgery	-7.532	2.040	-3.692	< 0.001	-11.580 to -3.484
CAQ	-5.264	1.242	-4.237	< 0.001	-0.429 to -0.155
EPDS	-0.189	0.197	-6.041	< 0.001	-1.580 to -0.799
No fear of a bad pregnancy	4.193	2.035	2.060	0.042	0.155 to 8.230
Multiparas	-7.457	2.781	-2.682	0.009	-12.974 to -1.939

EPDS: Edinburgh Postnatal Depression Scale; CAQ: Cardiac Anxiety Questionnaire. $F(5,99) = 23.989$; $P < 0.001$; $R^2 = 0.548$; adjusted $R^2 = 0.525$; $D-W = 1.934$.

healthcare utilization, improve healing, and eventually assist these women in self-managing their heart issues.

ARTICLE HIGHLIGHTS

Research background

Postpartum quality of life (QoL) in women with heart disease has been neglected widely.

Research motivation

Diminished postpartum QoL in heart disease patients escalates disease burden and social challenges, necessitating an active healthcare approach for pregnancy and recovery.

Research objectives

This study aimed to investigate the medical data and subjective factors on postpartum QoL and develop targeted healthcare strategies to improve outcomes for these high-risk women.

Research methods

This research was a retrospective analysis of QoL at 6 wk after birth in patients with heart disease at our center, combining medical data and subjective assessments to evaluate and address QoL concerns.

Research results

According to the data from 105 postpartum cardiac patients, no previous cardiac surgery, multiparity, greater sadness and cardiac anxiety, and fear of unfavorable pregnancy outcomes were strongly related to lower QoL.

Research conclusions

Our research suggests that healthcare professionals should acknowledge and address the distinct needs of postpartum women with heart disease, integrating comprehensive management strategies into their maternity care.

Research perspectives

Future studies should focus on longitudinal research to evaluate perinatal women's QoL, social-environmental factors, and self-efficacy, guiding the development of family care and telemedicine.

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FOOTNOTES

Author contributions: Liu JL and Qu DY were involved in the design and conduct of the study as well as the interpretation of data; Liu JL contributed to the statistical design of the study and the interpretation of data; Wang Q was involved in the design of the study and interpretation of data; Liu JL, Wang Q, and Qu DY contributed as clinical experts for data interpretation; All authors participated in the development of the manuscript and approved the final version for submission.

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