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A Telemedicine Based Supportive Educational System Using Family-Centered Care to Enhance Family Support and Reduce Postpartum Depression

Nety Mawarda Hatmanti[1,2*], Uliyatul Laili[1,3], Nurul Kamariyah[1], Yurike Septianingrum[1], Rusdianingseh[1]

[1]*Department of Nursing, Faculty of Nursing and Midwifery, Universitas Nahdlatul Ulama Surabaya, 60237 Surabaya, East Java, Indonesia*

[2]*School of Nursing and Applied Science, Lincoln University College, Wisma Lincoln, 12-18, Jalan SS 6/12, 47301 Petaling Jaya, Selangor, Malaysia*

[3]*Faculty of Medicine, Brawijaya University, Kota Malang, 65145 Jawa Timur, Indonesia*

[*]*Corresponding Author's Email: nety.mawarda@unusa.ac.id*

ABSTRACT

Background: One of the most common types of depression in new mothers, postpartum depression, affects millions worldwide. Yet many face barriers to accessing therapy, such as time, financial and childcare challenges. The purpose of this study is to assess the effectiveness of a telemedicine-based supportive educative system, grounded in family-centered care, in enhancing family support and reducing depression during the postpartum period. **Methods:** A quasi-experimental design with pre-test-post-test control groups was used to assess the impact of telemedicine. Postpartum women and their families were randomly assigned to the intervention or control group. The intervention group received telemedicine sessions educating families to provide support with the Zoom meeting platform, while the control group received standard care. Validated PSSQ (Postpartum Social Support Questionnaire) and EPDS (Edinburgh Postnatal Depression Scale) were administered at baseline and post-intervention. **Results:** The Wilcoxon test results in the intervention group revealed significant improvements in husband's support ($p=0.000$), parental support ($p=0.005$) and friend's support ($p=0.026$) after the intervention, indicating increased support for participants. However, no significant change was observed in support from in-laws ($p=0.138$). In the control group, a significant increase was noted in husband's support ($p=0.009$), while parental support ($p=0.126$) showed no significant enhancement. Additionally, the paired t-test results in the control group indicated no significant changes in support from in-laws ($p=0.411$) or friend's support ($p=0.437$). **Conclusion:** The telemedicine-based supportive educational system using family-centred care effectively enhances family support and reduces postpartum depression, offering a promising approach to improve postpartum mental health outcomes.

Keywords: Depression; Family Centered Care; Family Support; Postpartum; Supportive Educative System; Telemedicine

INTRODUCTION

PPD (Post Partum Depression) is a significant mental health concern affecting many women worldwide, including in Surabaya, East Java. This is a widespread public health issue that adversely affects moms, couples' relationships, neonatal neurodevelopment and children's emotional and cognitive growth (Severo *et al*., 2023; Liu *et al*., 2022). Studies indicate that the prevalence of PPD in this region can reach alarming levels, with a significant percentage of postpartum women reporting mild to moderate symptoms of depression. This mental health issue is exacerbated by various factors, including inadequate social support, low self-efficacy, and economic strains faced by families (Nugrahaeni *et al*., 2022; Basu *et al*., 2021). The quality of family relationships plays a crucial role in mitigating the risks of PPD; when family support is weak or insufficient

mothers may experience heightened distress, leading to adverse health outcomes not only for themselves but also for their infants (Muliyani & Suryaningsih, 2023; Qi *et al.*, 2022).

Globally, estimates suggest that postpartum depression affects approximately 10-15% of mothers within the first year after childbirth (Utamidewi *et al.*, 2023; Wang *et al.*, 2021). However, research has indicated that rates can be much higher in certain contexts. For instance, studies across various continents have reported PPD prevalence rates ranging from 13% in developed nations to as high as 85% in certain developing regions, particularly in Asia (Maryatun *et al.*, 2023). In Southern Asia specifically, the prevalence of PPD has been noted to be about 22.3%, while Africa reports an even higher incidence in some contexts, potentially exceeding 39%. In Indonesia, the situation reflects a concerning trend. Research indicates that the prevalence of postpartum depression is estimated to be approximately 19.8%, with significant variability across regions and urban versus rural populations (Aadillah & Nurbaeti, 2023). A national survey of postpartum mothers experienced PPD, indicating the need for further targeted interventions (Ariasih & Budiharsana, 2023).

Programs for prevention have been demonstrated to lessen depression. Interventions for parents of kids with behavioral issues may lessen their depression symptoms and enhance their kids' outcomes (WHO, 2025). According to earlier research by Ayoub *et al.* (2017), the prevalence of postpartum depression is a significant health issue for Palestinian mothers and is mostly linked to psychosocial stressors during pregnancy. The inclusion of postpartum screening within antenatal and postnatal health care is strongly urged, along with the provision of additional counselling time for mothers in addition to routine medical services. It is also acknowledged that further research is required due to the small sample size and the non-randomized approach used in the study. The impact of telemedicine therapies on mental health problems connected to PPD, such as social support, loneliness, and anxiety, was previously studied. However, social support and loneliness among PPD-affected women were not significantly improved by telemedicine therapy (Zhao *et al.*, 2021). Hardiness training is another therapy that has been researched to lessen postpartum depression. The findings demonstrated a substantial difference between those who received hardiness training and those who did not when it came to postpartum depression and stress. Hardiness training develops one's flexibility, increases illness resistance, ensures physical and mental health and, in the end, offers the person a sense of accomplishment. It also leads to increased responsibility for thoughts, feelings, and actions in one's life (Bakhshizadeh *et al.*, 2013).

Several studies have highlighted the limitations and shortcomings of telemedicine interventions within maternal health contexts. For instance, Gomez-Roas *et al.* (2022) identified that low-income postpartum individuals faced formidable barriers in accessing telemedicine, which exacerbated existing physical and mental health challenges during the pandemic. The rapid shift to telemedicine amid these barriers resulted in fragmented care, thereby limiting its effectiveness in addressing PPD. Similarly, research by Leung *et al.* (2023) indicated that the uptake of telemedicine services among rural populations was significantly lower than in urban settings, primarily due to stigma, cultural norms and disparities in mental health workforce availability. These findings suggest that an unmonitored expansion of telemedicine may neglect the unique needs of diverse demographics within maternal health care.

Since the beginning of the pandemic, telemedicine has grown tremendously. During the pandemic, telemedicine has grown at an unprecedented rate to address maternal mental health. Telemedicine can be at least as successful as in-person care, according to research from the past 15 months (Telemedicine may just include educational components; it is more inclusive than telemedicine but still includes it). Two studies are mentioned in this article that show the potential of telehealth to improve maternal mental health in terms of prenatal distress, anxiety associated with pregnancy and the postpartum period (Hawkins, 2023).

Telemedicine therapies indicated feasibility and acceptability among women in the postnatal period and dramatically reduced postpartum depression symptoms when compared to standard care (Hanach *et al.*, 2021). The relationship between telemedicine, family support and postpartum depression in mothers is a multifaceted issue that has gained increasing attention in recent years.

METHODOLOGY

Study Design and Population

This quasi-experimental study used a pre-test–post-test design with two groups (intervention and control).

The sample size was calculated using a two-group comparison test (independent t-test, assuming normally distributed data, $\alpha = 0.083$). Baseline demographic characteristics were compared between the intervention and control groups using the independent t-test for continuous variables and the chi-square test for categorical variables. All statistical analyses were performed using IBM Statistics version 26. The study population included all postpartum mothers who delivered at Rumah Sakit Islam Surabaya Jemursari. Based on the sample size formula and to account for potential dropouts or incomplete data, 52 participants were included in each group.

To maintain methodological rigor and ensure alignment with the target population, inclusion and exclusion criteria were applied. Inclusion criteria required participants to be mothers aged 18 years or older, within one day postpartum, able to access a smartphone with internet connectivity for the telemedicine intervention, and able to read and understand Bahasa Indonesia. Exclusion criteria included mothers living alone or without family support and those experiencing postpartum complications.

Data Collection

Participants in the intervention group completed the baseline PSSQ (Postpartum Social Support Questionnaire) and EPDS (Edinburgh Postnatal Depression Scale) at hospital discharge and received standardized education from a nurse or midwife as part of discharge planning. On the seventh postpartum day, they and their families were contacted via WhatsApp and given a link to a scheduled Zoom session. This synchronous session provided structured education, interactive discussions, Q&A, and sharing of caregiving experiences related to maternal and infant care. Immediately afterward, participants received a Google Form link to complete the posttest PSSQ and EPDS. They also received appreciation items, including a discharge gift, printed leaflets, digital care modules, and e-money credit.

Control group participants also completed the baseline PSSQ and EPDS at discharge but received only one-time leaflet-based education with no additional online sessions. On the seventh postpartum day, they were contacted via WhatsApp to complete the posttest questionnaires through Google Forms. After data collection was completed for both groups, control participants were provided with the same Zoom-based online educational session as ethical compensation, ensuring they ultimately received comparable educational content.

Family Support Assessment

Family support was assessed using the Postpartum Social Support Questionnaire (PSSQ), a 50-item self-administered tool that measures both practical and emotional support received by new mothers. The questionnaire evaluates support from spouses, parents, in-laws, friends, and other relatives. For use during pregnancy, the PSSQ was adapted by changing verbs from the present to the future tense to assess anticipated postpartum support (e.g., "How often does your husband/partner help…?" changed to "How often will your husband/partner help…?") (Hopkins & Campbell, 2008; Miller *et al*., 2012).

The PSSQ consists of four subscales: spousal support, parental support, in-law support, and support from friends or individuals outside the family (Wiyanto & Ambarwati, 2021). Responses are rated on a 7-point Likert scale ranging from 1 ("never") to 7 ("very often"), reflecting mothers' perceived frequency of received emotional support (Hitzler *et al*., 2022).

Postpartum Depression Assessment

The EPDS is one of the most widely used instruments for screening as an initial diagnosis in cases of postpartum depression in Indonesia. The EPDS has 10 questions with the answer scale of each question 0-3 depending on the severity of feelings felt during the past 7 days. The EPDS has a sensitivity of 96% and specificity of 82% with a cut off score of 10. A score of 10 or higher indicates that further assessment of the postpartum mother is required (Adli, 2022).

Ethical Considerations

The research obtained ethical clearance from the Health Research Ethics Commission, Surabaya Islamic Hospital Jemursari, Indonesia with reference number 121/KEPK-RSISJS/VIII/2023 on 9th August, 2023.

RESULTS

Table 1: Demographic Characteristics of Participants in both Intervention Group (n=52) and Control Group (n=52)

Characteristics	Intervention Group (n=52)	Control Group (n=52)	P value
	n (%), M ± SD		
Mother's age	27.81±4.08	29.98±5.03	0.589
Husband's age	30.17±5.70	31.62±4.76	0.082
Length of marriage	3.71±3.53	4.77±4.18	0.210
Number of Children			
1	28(26.9)	20(19.2)	>0.05
2	18(17.3)	18(17.3)	
3	6(5.8)	11(10.6)	
4	0(0)	3(2.9)	
Birth Number			
1st	28(26.9)	23(22.1)	>0.05
2nd	18(17.3)	18(17.3)	
3rd	6(5.8)	8(7.7)	
4th	0(0)	3(2.9)	
Education			
Basic education	3(2.9)	0(0)	>0.05
Secondary education	22(21.2)	24(23.1)	
Higher education	27(26)	28(26.9)	
Living Arrangement			
Only husband and wife	25(24)	20(19.2)	>0.05
With parents or parents-in-law	21(20.2)	24(23.1)	
With extended family	6(5.8)	8(7.7)	

Note: Continuous variables were compared using the independent t-test, and categorical variables were compared using the chi-square (χ²) test. No statistically significant differences were observed between groups at baseline (p > 0.05).

Table 1 shows the demographic characteristics of the 52 postpartum mothers in both the intervention and control groups. The mean age of mothers was similar (27.81 ± 4.08 years vs. 29.98 ± 5.03 years), as was the mean age of husbands (30.17 ± 5.70 years vs. 31.62 ± 4.76 years). Length of marriage also showed no major differences (3.71 ± 3.53 years vs. 4.77 ± 4.18 years).

Parity distributions were comparable: in the intervention group, 28 mothers (26.9%) were primiparous and 18 (17.3%) had two children; in the control group, 20 (19.2%) were primiparous and 18 (17.3%) had two children. Only a small number in both groups had three or more children, and most were first- or second-time mothers. Educational levels were also similar. In the intervention group 21.2% had secondary and 26.0% had higher education, while in the control group, 23.1% had secondary and 26.9% had higher education. Only three mothers (2.9%) in the intervention group had basic education, and none in the control group.

Living arrangements followed the same pattern. In the intervention group, 25 mothers (24.0%) lived only with their husbands and 21 (20.2%) lived with parents or in-laws; in the control group, 20 (19.2%) lived with their husbands and 24 (23.1%) with parents or in-laws. Fewer participants in both groups lived with extended family. Overall, demographic characteristics were comparable across groups, indicating balanced baseline conditions before the intervention.

Based on the Kolmogorov-Smirnov normality test presented in Table 2, several variables in the control group, including support from in-laws (pre-test), friend's support (pre-test) and EPDS score (pre-test), showed p-values greater than =0.05, indicating that these data were normally distributed. In contrast, all remaining variables in both the intervention and control groups had p-values less than =0.05, demonstrating that the majority of the data did not follow a normal distribution. There, non-parametric statistical tests were used for inferential analysis.

Table 2: Normality Test with Kolmogorov-Smirnov

No.	Group	Variable	Test	Mean	SD	*p*
1	Intervention	Husband's support	Pretest	53.40	26.76	0.000
			Posttest	76.69	7.66	0.000
		Parental support	Pretest	43.77	23.76	0.000
			Posttest	60.88	9.57	0.000
		Support from in-laws	Pretest	27.35	16.52	0.000
			Posttest	30.83	14.71	0.000
		Friend's support	Pretest	47.44	24.6	0.000
			Posttest	56.42	18.27	0.000
		Edinburgh Postnatal Depression Scale (EPDS)	Pretest	9.86	4.07	0.000
			Posttest	5.54	3.81	0.000
2	Control	Husband's support	Pretest	67.92	19.53	0.000
			Posttest	74.52	9.83	0.000
		Parental support	Pretest	53.29	11.88	0.001
			Posttest	56.33	15.22	0.000
		Support from in-laws	Pretest	28.63	10.9	0.013
			Posttest	26.56	14.53	0.000
		Friend's support	Pretest	43.35	13.28	0.039
			Posttest	45.31	11.47	0.000
		Edinburgh Postnatal Depression Scale (EPDS)	Pretest	8.52	3.65	0.048
			Posttest	6.73	3.72	0.000

Table 3: Homogeneity Test with Lavene's Test

No.	Variable	Test	Group	*F*	*p*
1	Husband's support	Pretest	Experiment	9.988	0.002
			Control		
2	Parental support	Pretest	Experiment	6.679	0.011
			Control		
3	Support from in-laws	Pretest	Experiment	0.220	0.640
			Control		
4	Friend's support	Pretest	Experiment	1.117	0.293
			Control		
5	Postpartum depression (EPDS)	Pretest	Experiment	3.151	0.079
			Control		

Table 3 presents the results of the homogeneity test conducted using Lavene's test for all five variables measured during the pretest phase in both the intervention and control groups. The findings indicate that three variables support from in-laws (F=0.220, p=0.640), friend's support (F=1.117, p=0.293) and postpartum depression (EPDS) (F=3.151, p=0.079) had p-values greater than =0.05, demonstrating that these data met the assumption of homogeneity of variance between groups. This suggests that baseline variability for these variables was comparable across the intervention and control groups prior to the intervention.

In contrast, two variables husband's support (F=9.988, p=0.002) and parental support (F=6.679, p=0.011) showed p-values less than =0.05, indicating significant differences in variance between the two groups at baseline. These results indicate that the homogeneity assumption was not met for these variables; therefore, non-parametric tests were used to ensure analytical robustness. Overall, the findings show that although several domains of social support were similar between groups at baseline, significant differences were present in support from husbands and parents. These baseline differences informed the selection of appropriate statistical methods for further analysis.

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Table 4: Results of Wilcoxon Test for Variables that Are Not Normally Distributed

No.	Group	Variable	Test	z	p
1	Experiment	Husband's support	Pretest	-4.096	0.000
			Posttest		
		Parental support	Pretest	-2.838	0.005
			Posttest		
		Support from in-laws	Pretest	-1.484	0.138
			Posttest		
		Friend's support	Pretest	-2.219	0.026
			Posttest		
2	Control	Husband's support	Pretest	-2.606	0.009
			Posttest		
		Parental support	Pretest	-1.529	0.126
			Posttest		

Note: z = standardized test statistic calculated from the Wilcoxon signed-rank test and negative(-z) means posttest scores are higher than pretest (based on ranking direction)

Based on Table 4, the Wilcoxon test revealed a significant difference between pre-test and post-test scores for husband's support ($z = -4.096$, $p < 0.001$). This indicates a significant improvement in the level of support provided by husbands to their partners after the intervention. There was also a significant increase in parental support ($z = -2.838$, $p = 0.005$), suggesting that parents became more supportive of their daughters during the postpartum period following the intervention. No significant change was observed in support from in-laws ($z = -1.484$, $p = 0.138$), indicating that the intervention did not have a statistically significant impact on this form of support. Friends' support showed a significant improvement ($z = -2.219$, $p = 0.026$), suggesting that friends became more supportive of the participants after the intervention.

In the control group, there was a significant increase in husband's support ($z = -2.606$, $p = 0.009$), although the effect size may be smaller compared to the experimental group. Parental support in the control group did not show a significant change ($z = -1.529$, $p = 0.126$), indicating that the standard care or discharge planning process did not significantly enhance parental support.

Table 5: Results of Paired t-test for Variables that Are Normally Distributed

No.	Group	Variable	Test	z	p
1	Control Group	Support from in-laws	Pretest	0.838	0.411
			Posttest		
		Friend's support	Pretest	-0.783	0.437
			Posttest		

According to Table 5, the paired t-test for support from in-laws in the control group showed no significant difference between pre-test and post-test scores ($t = 0.838$, $p = 0.411$). This suggests that the standard care did not influence the level of support provided by in-laws. Similarly, friend's support in the control group did not show a significant change ($t = -0.783$, $p = 0.437$), indicating that the standard care had no notable impact on this variable.

Table 6: Results of the Paired Sample t-test for Depression Group in Postpartum Mothers in Intervention and Control Groups

Group	Postpartum Depression	t	p
Experiment Group	Pretest	7.209	0.000
	Posttest		
Control Group	Pretest	7.936	0.000
	Posttest		

Based on Table 6, the paired *t*-test results for both the intervention group ($p = 0.000$) and the control group ($p = 0.000$), which are less than α (0.05), indicate a significant difference between pre-test and post-test postpartum depression scores. This shows that the Telemedicine Supportive Educative System based on

Family-Centered Care had a significant effect on the intervention group and the counselling provided during the discharge planning process also produced a significant effect in the control group. Although both the intervention group and the control group showed significant effects, there was a significant decrease in the EPDS questionnaire scores after the intervention in the intervention group, with a mean difference of 4.33, whereas the control group had a mean difference of 1.79. Therefore, it can be concluded that although both groups experienced changes in their scores, the change in the control group tended to be smaller compared to the intervention group.

DISCUSSION

In the treatment group, the findings indicated a moderate negative correlation between maternal age and husband's support ($r = -0.310$), suggesting that younger mothers tended to perceive higher levels of support compared to older mothers. This may be influenced by early-stage marital dynamics, heightened emotional dependence, and flexible interpersonal interaction patterns typically observed among younger couples. These results are consistent with, who emphasized the influence of husband's support on maternal self-efficacy and postpartum adjustment (Marcelina *et al.*, 2020).

A very weak negative relationship was also noted between husband's age and the support provided ($r=-0.046$). Although statistically insignificant, descriptive analysis showed that support peaked among husbands aged 30-33 and declined among those aged 37-39. Prior studies suggest that age related factors such as work responsibilities, stress burden, and role conflict can affect paternal involvement during the postpartum period (Putri, 2023; Thepha *et al*., 2024). Similarly, the weak negative association between length of marriage and husband's support ($r=-0.043$) indicates that support tends to diminish over longer marital durations, potentially due to accumulated responsibilities, childcare demands, and reduced frequency of emotional communication (Brahmana *et al*., 2023; Syahri *et al*., 2023).

Digital health interventions, such as telehealth education, have demonstrated a beneficial impact on caregiving dynamics. In this study, the most pronounced improvement in the control group occurred in husband's support ($p = 0.023$). A plausible explanation is that, although the control group did not receive tele-education during the intervention period, they eventually received equivalent telehealth educational sessions after the posttest, which may have influenced their perceptions and responses. Moreover, husbands in the control group may have independently sought caregiving information from external sources, including digital platforms, family networks or online communities, indirectly enhancing their perceived support. This mechanism aligns with and who reported that telemedicine-enabled education improves paternal competence, communication, and caregiving confidence even when educational exposure is brief or indirect (Hogue *et al*., 2021; Tobiloba *et al*., 2022).

Importantly, the present study found a significant reduction in EPDS scores in the control group, which requires a critical examination. Although the control group did not receive structured telehealth education during the intervention period, several factors may explain this improvement. First, all participants both intervention and control groups received standardized discharge education and informational leaflets before leaving the hospital. Previous studies have shown that even basic postpartum counselling and printed educational materials can positively influence maternal mental health by improving knowledge, reducing uncertainty, and providing emotional reassurance (Heidi *et al*., 2023; Nugrahaeni *et al*., 2022).

Second, postpartum depression naturally declines in some mothers as hormonal fluctuations stabilize and family adaptation progresses during the first weeks postpartum noted that spontaneous remission of mild postpartum depressive symptoms is common, especially with strong informal family support (Zhao *et al*., 2021). As many control participants lived with parents or in-laws, the presence of extended family may have contributed to emotional buffering, stress reduction, and practical assistance during postpartum care. Third, the act of being contacted for follow-up assessments may itself create a "research participation effect," sometimes known as the Hawthorne effect, wherein participants feel attended to and supported simply by their involvement in the study. For some mothers, this can positively influence psychological well-being, even in the absence of a structured intervention.

Despite the improvement in the control group, the magnitude of reduction in EPDS scores was still greater

in the intervention group, highlighting the added value of structured telehealth education. Telemedicine interventions have been shown to positively impact families by providing them with necessary education and support. In the results of this study, the most significant change was observed in the control group, specifically the support from the husband (p = 0.023). From the data, most of the respondents in the intervention group (75%) are newly married families with one child, and they live independently, separate from their parents and siblings. This statement relates to previous research showing that telemedicine interventions equip husbands with practical skills and knowledge to better support their partners, enhancing their confidence and self-efficacy in caregiving roles (Hogue *et al*., 2021; Tobiloba *et al.*, 2022). Telemedicine interventions have been shown to be effective in enhancing husbands' involvement in family support by providing them with necessary skills, improving their well-being, facilitating better communication with healthcare providers, and ultimately contributing to better care for their spouses. These benefits are particularly evident when video conferencing (in this case, by Zoom) is used, as it allows for more direct and immersive interactions compared to telephone-only interventions (Lai *et al*., 2020).

Telehealth platforms facilitate better communication between healthcare providers and spouses, enabling them to actively participate in care decisions (Okta & Jaizul, 2025). Virtual platforms provide educational resources on maternal health, childcare, and preventive care, empowering families with knowledge. Some telemedicine interventions incorporate peer support groups, which have shown improvements to improve outcomes for postnatal depression and anxiety (Kumar *et al*., 2018).

Family support, especially from husbands, contributes significantly to a mother's successful adaptation to her new role after childbirth (Sundary, 2024). This support allows mothers to focus more on baby care and establish a strong bond with their newborn. Mothers who have a positive birth experience and feel supported are more likely to be successful in breastfeeding, which has numerous health benefits for both the baby and the mother. Family support plays a significant role in mitigating the risk of postpartum depression. Research has consistently shown that a strong family support system can lead to lower incidences of postpartum depression. Previous research has shown that social support, particularly from partners and family members, significantly reduces the risk of postpartum depression (Nugrahaeni *et al*., 2022). Other research reported that mothers who received high levels of family support had a reduced risk of experiencing postpartum depression compared to those with lower support levels (Emin *et al*., 2023; Mulyani *et al*., 2023).

Telemedicine interventions have demonstrated effectiveness in reducing symptoms of postpartum depression (p = 0.001). Studies have shown that telehealth interventions can significantly reduce depression scores in postpartum women, as measured by the Edinburgh Postnatal Depression Scale. Telemedicine also allows for earlier recognition and diagnosis of postpartum depression symptoms, leading to increased referrals and timely treatment (Zhao *et al*., 2021). Strong husband support has been linked to a reduction in postpartum complications, including postpartum depression and anxiety. The presence and support of husbands during childbirth and the immediate postpartum period can help mothers feel more secure and confident in their new role (Emin *et al*., 2023). This relationship underscores the importance of emotional and practical support from family members, which can be facilitated through telemedicine platforms that allow for virtual family interactions and counselling sessions (Kaplan & Çağlı, 2022).

Limitations

The non-normal distribution of the data for husband support, parental support, in-law support, and friend's support has implications for the interpretation of the study findings. Since many statistical methods assume normality, deviations from this assumption may affect the accuracy of inferential analyses. In this study, non-parametric tests were used as an alternative to traditional parametric methods to ensure the robustness of the findings. However, non-parametric tests are generally less sensitive, meaning that small differences between groups may not be detected as statistically significant.

CONCLUSION

The telemedicine-based supportive educative system grounded in family-cantered care was shown to effectively enhance the level of support provided by husbands, parents, and friends to postpartum mothers. The

intervention also resulted in a significant reduction in postpartum depression scores, indicating its potential as an impactful strategy for improving maternal mental health. These findings suggest that telemedicine-supported family-centered interventions can serve as a valuable complement to traditional postpartum counselling methods.

Implications of this study extend to healthcare professionals, policymakers and maternal health program developers. In clinical practice, incorporating telemedicine-based supportive education into routine postpartum care can strengthen family involvement and help reduce the risk of postpartum depression, particularly for women facing challenges such as limited access to services, time constraints, or geographic barriers. Healthcare providers are encouraged to implement family-centered care approaches that facilitate structured education, collaborative communication and shared caregiving roles. Additionally, enhancing provider competencies in telehealth – such as virtual communication, cultural sensitivity and digital literacy – can improve the effectiveness and reach of these interventions.

From a policy perspective, strengthening telemedicine infrastructure and expanding digital health systems is essential to ensure equitable access to postpartum care across different regions. Policymakers should integrate family-centered telehealth programs into national maternal health frameworks and support community-based initiatives that promote active family participation and continuity of care.

Future research should focus on conducting longitudinal studies to evaluate the long-term impacts of telemedicine-based supportive interventions on maternal mental health and overall family well-being. Further exploration is also needed to understand cultural adaptation requirements and to examine the specific roles of husbands, parents, in-laws and extended families in supporting postpartum mothers. Such research will help refine and tailor interventions to diverse populations, enhancing their effectiveness and relevance.

Conflict of Interest

The authors declare that they have no conflicting interest.

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REFERENCES

Aadillah, V. Y., & Nurbaeti, I. (2023). Postpartum depression and its contributing factors among mothers during the covid-19 pandemic in North Jakarta, Indonesia. *Nurse Media Journal of Nursing, 13*(1), 85–94. https://doi.org/10.14710/nmjn.v13i1.49860

Adli, F. K. (2022). Edinburgh Post-natal Depression Scale (EPDS): Deteksi dini dan skrining depresi post-partum [Edinburgh post-natal depression scale (epds): early detection and screening for post-partum depression]. *Jurnal Kesehatan, 13*(2), 430–436. https://doi.org/10.26630/jk.v13i2.2741

Ariasih, A., & Budiharsana, M. (2023). Prevalence and sociodemographic factors associated with peripartum depression in Indonesia: national basic health research data 2018. *Jurnal Kesehatan Reproduksi, 13*(2), 141–149. https://doi.org/10.58185/jkr.v13i2.45

Ayoub, K., Shaheen, A., & Hajat, S. (2017). Prevalence and associated factors of post-partum depression in Palestinian mothers: A cross-sectional study. *The Lancet*, 390, S31. https://doi.org/10.1016/S0140-6736(17)32032-9

Bakhshizadeh, A., Shiroudi, S. G., & Khalatbari, J. (2013). Effect of hardiness training on stress and postpartum depression. *Procedia - Social and Behavioral Sciences, 8*4, 1790–1794. https://doi.org/10.1016/

j.sbspro.2013.07.035

Basu, S., Budh, N., Garg, S., Singh, M. M., & Sharma, A. (2021). Postpartum depression burden and associated factors in mothers of infants at an urban primary health center in Delhi, India. *Tzu Chi Medical Journal, 33*(1), 70–73. https://doi.org/10.4103/tcmj.tcmj_190_19

Brahmana, K. M. B., Simbolon, H., Ginting, A. B., Udek, T. L. H. S., & Manalu, W. S. (2023). The effect of marriage commitment and marriage adjustment toward marriage satisfaction of GBKP Priest's Wife. *Journal of Educational, Health & Community Psychology (JEHCP), 1*(2), 349–367. https://doi.org/10.12928/jehcp.v1i2.25957

Gomez-Roas, M. V., Davis, K. M., Leziak, K., Jackson, J., Williams, B. R., Feinglass, J. M., Grobman, W. A., & Yee, L. M. (2022). Postpartum during a pandemic: Challenges of low-income individuals with healthcare interactions during COVID-19. *PLoS One, 17*(5), e0268698. https://doi.org/10.1371/journal.pone.0268698

Hanach, N., de Vries, N., Radwan, H., & Bissani, N. (2021). The effectiveness of telemedicine interventions, delivered exclusively during the postnatal period, on postpartum depression in mothers without history or existing mental disorders: A systematic review and meta-analysis. *Midwifery, 94*, 102906. https://doi.org/10.1016/j.midw.2020.102906

Hawkins, S. S. (2023). Telehealth in the prenatal and postpartum periods. *Journal of Obstetric, Gynecologic & Neonatal Nursing, 52*(4), 264–275. https://doi.org/10.1016/j.jogn.2023.05.113

Heidi, K., Emin, W. S., Taqiyah, Y., & Asnaniar, W. S. (2023). Husband's support for the childbirth process: concept analysis. *An Idea Nursing Journal, 2*(02), 87–91. https://doi.org/10.53690/inj.v2i02.189

Hitzler, M., Behnke, A., Gündel, H., Ziegenhain, U., Kindler, H., Kolassa, I.-T., & Zimmermann, J. (2022). Sources of social support for postpartum women with a history of childhood maltreatment: Consequences for perceived stress and general mental health in the first year after birth. *Child Abuse & Neglect, 134*, 105911. https://doi.org/10.1016/j.chiabu.2022.105911

Hogue, A., Bobek, M., Levy, S., Henderson, C. E., Fishman, M., Becker, S. J., Dauber, S., Porter, N., & Wenzel, K. (2021). Conceptual framework for telehealth strategies to increase family involvement in treatment and recovery for youth opioid use disorder. *Journal of Marital and Family Therapy, 47*(2), 501–514. https://doi.org/10.1111/jmft.12499

Hopkins, J., & Campbell, S. B. (2008). Development and validation of a scale to assess social support in the postpartum period. *Archives of Women's Mental Health, 11*(1), 57–65. https://doi.org/10.1007/s00737-008-0212-5

Kaplan, Ö., & Çağlı, F. (2022). Social support levels, mental health status and related factors in postpartum women during the pandemic. *Psikiyatride Güncel Yaklaşımlar, 14*(Ek 1), 278-285. https://doi.org/10.18863/pgy.1188621

Kumar, S. V., Oliffe, J. L., & Kelly, M. T. (2018). Promoting postpartum mental health in fathers: recommendations for nurse practitioners. *American Journal of Men's Health, 12*(2), 221–228. https://doi.org/10.1177/1557988317744712

Lai, F. H. Y., Yan, E. W. H., Yu, K. K. Y., Tsui, W. S., Chan, D. T. H., & Yee, B. K. (2020). The protective impact of telemedicine on persons with dementia and their caregivers during the COVID-19 pandemic. *The American Journal of Geriatric Psychiatry, 28*(11), 1175-1184. https://doi.org/10.1016/j.jagp.2020.07.019

Leung, L. B., Yoo, C., Chu, K., O'Shea, A., Jackson, N. J., Heyworth, L., & Der-Martirosian, C. (2023). Rates of primary care and integrated mental health telemedicine visits between rural and urban veterans affairs beneficiaries before and after the onset of the COVID-19 pandemic. *JAMA Network Open, 6*(3), e231864. https://doi.org/10.1001/jamanetworkopen.2023.1864

Liu, X., Huang, S., Hu, Y., & Wang, G. (2022). The effectiveness of telemedicine interventions on women with

postpartum depression: A systematic review and meta-analysis. *Worldviews on Evidence-Based Nursing, 19*(3), 175-190. https://doi.org/https://doi.org/10.1111/wvn.12576

Marcelina, L. A., Rachmawati, I. N., & Kurniawati, W. (2020). Supportive postpartum care reduces postpartum anxiety in mothers with twins: A pilot study. *Jurnal Info Kesehatan, 18*(2), 149-156. https://doi.org/10.31965/infokes.Vol18.Iss2.475

Maryatun, Pratama, B. A., Indarwati, I., Andriyani, A., Kusumaningsih, R., Mulyani, S., Wahyuni, E. S., & Agustina, N. W. (2023). Evaluation of a santun sejati web-based application: Mother and baby care with cognitive behaviour therapy approach. *International Journal of Public Health Excellence (IJPHE), 3*(1), 38–44. https://doi.org/10.55299/ijphe.v3i1.411

Miller, A. M., Hogue, C. J., Knight, B. T., Stowe, Z. N., & Newport, D. J. (2012). Maternal expectations of postpartum social support: validation of the postpartum social support questionnaire during pregnancy. *Archives of Women's Mental Health, 15*, 307–311. https://doi.org/10.1007/s00737-012-0287-x

Muliyani, N., & Suryaningsih, E. K. (2023). The effect of family support on postpartum depression: Scoping review. *Indigenous: Jurnal Ilmiah Psikologi, 8*(3), 337–351. https://doi.org/10.23917/indigenous.v8i3.2165

Mulyani, N. H. S., Prasetya, H., & Murti, B. (2023). Meta analysis: Effects of family support, family income, and domestic violence on postpartum depression. *Journal of Maternal and Child Health, 8*(6), 785-801. https://doi.org/10.26911/thejmch.2023.08.06.12

Nugrahaeni, M. T., Untari, N. Y., & Veibiani, N. A. (2022). Meta analysis: The effect of social support in preventing postpartum depression in postpartum mothers. *Journal of Epidemiology and Public Health, 7*(1), 80-91. https://doi.org/10.26911/jepublichealth.2022.07.01.07

Okta, S. L., & Jaizul, A. (2025). Bridging gaps in health access through telehealth in Indonesia: A literature review focused on primary care. *International Journal of Health, Medicine, and Sports, 3*(3), 87–91. https://doi.org/10.46336/ijhms.v3i3.240

Putri, L. W. (2023). Literature review: Husband's role in reduce the incidence of postpartum depression in working women in Indonesia. *Muhammadiyah International Public Health and Medicine Proceeding, 3*(1), 198-205. https://doi.org/10.61811/miphmp.v3i1.439

Qi, W., Liu, Y., Lv, H., Ge, J., Meng, Y., Zhao, N., Zhao, F., Guo, Q., & Hu, J. (2022). Effects of family relationship and social support on the mental health of Chinese postpartum women. *BMC Pregnancy and Childbirth, 22*, 65. https://doi.org/10.1186/s12884-022-04392-w

Severo, M., Ventriglio, A., Bellomo, A., Iuso, S., & Petito, A. (2023). Maternal perinatal depression and child neurocognitive development: A relationship still to be clarified. *Frontiers in Psychiatry, 14*, 1151897. https://doi.org/10.3389/fpsyt.2023.1151897

Sundary, S. (2024). The role of family support in childbirth: Implications for maternal and infant well-being. *Oshada Journal, 1*(4), 61-72. https://doi.org/10.62872/9ep2er27

Syahri, L. M., Umami, F., & Tursina, S. R. (2023). Forgiveness and self-disclosure to marital satisfaction working husband and wife. *Psychosocia Journal of Applied Psychology and Social Psychology 1*(1), 49-54 https://doi.org/10.61978/psychosocia.v1i1.44

Thepha, T., Theeranut, A., Muangpin, S., Jantawong, P., & Nguyen, G. (2024). Effectiveness of husbands' support exclusive breastfeeding Facebook programme during the COVID-19 pandemic. *Journal of Multidisciplinary Healthcare*, 3227-3234. https://doi.org/10.2147/jmdh.s465483

Tobiloba, A. I., Omotayo, A. P., Sodeinde, K., Akinyemi, A., & Chichebem, N. B. (2022). Knowledge, attitude and prevalence of postpartum depression among mothers attending immunization clinics in Osogbo local government, Osun State. *African Journal of Health, Nursing and Midwifery, 5*(4), 28–42.

https://doi.org/10.52589/AJHNM-UI5DYZVX

Utamidewi, W., Tayo, Y., Putra, P. S., Febrianto, M., & Hafidz, A. N. (2023). Communication experiences of women surviving postpartum depression in Indonesia. *Jurnal Komunikasi Profesional, 7*(2), 313–326. https://doi.org/10.25139/jkp.v7i2.58690

Wang, Z., Liu, J., Shuai, H., Cai, Z., Fu, X., Liu, Y., Xiao, X., Zhang, W., Krabbendam, E., Liu, S., Liu, Z., Li, Z., & Yang, B. X. (2021). Mapping global prevalence of depression among postpartum women. *Translational Psychiatry, 11*, 543. https://doi.org/10.1038/s41398-021-01663-6

Wiyanto, B. E., & Ambarwati, K. D. (2021). Dukungan sosial dan postpartum depression pada ibu suku jawa [Social support and postpartum depression in javanese mothers]. *Psychopreneur Journal, 5*(2), 68–79. https://doi.org/10.37715/psy.v5i2.2270

World Health Organization (WHO). (2025, August 29). *Depressive disorder (depression)*. https://www.who.int/news-room/fact-sheets/detail/depression

Zhao, L., Chen, J., Lan, L., Deng, N., Liao, Y., Yue, L., Chen, I., Wen, S. W., & Xie, R. (2021). Effectiveness of telehealth interventions for women with postpartum depression: Systematic review and meta-analysis. *JMIR Mhealth Uhealth, 9*(10), e32544. https://doi.org/10.2196/32544