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Development of the WhatsApp Hotline Family Support (Wahana) Service to Reduce Stress and the Burden of Dual Roles in Postpartum Mothers in Pontianak

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Abstract. *Stunting Postpartum maternal mental health in Indonesia remains a critical public health concern, with postpartum depression prevalence reaching 27% nationally and 27.7% in Pontianak. This study aimed to develop and evaluate the effectiveness of the WhatsApp Hotline Family Support (WAHANA) service as a Malay culture-based digital intervention to reduce stress and dual-role burden among postpartum mothers. A Research and Development (R&D) approach using the ADDIE model combined with a mixed-method design was employed. Needs analysis involved in-depth interviews and focus group discussions with 18 postpartum mothers, family members, and healthcare workers. The intervention produced 34 educational content items in text, infographic, short video, and voice note formats using the Pontianak Malay language, with expert validation yielding a Content Validity Index (CVI) of 0.92. A quasi-experimental pretest-posttest control group design involved an intervention group (n=15) receiving WAHANA services and a control group (n=15) receiving routine postnatal care over six weeks. Paired t-tests showed significant reductions in stress by 8.4 points (p=0.001) and dual-role burden by 7.6 points (p=0.002), alongside increased family support by 9.1 points (p=0.001). Independent t-tests confirmed significant between-group differences (p<0.05). Qualitative findings indicated reduced isolation, improved spousal communication, cultural appreciation, and remote accessibility. WAHANA demonstrated validity, acceptability, and effectiveness as a culturally appropriate postpartum mental health intervention.*

Keywords: *Postpartum Mother, Stress, Dual-Role Burden, Family Support, Whatsapp Hotline, Malay Culture*

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INTRODUCTION

The postpartum period represents a critical transition in which mothers experience substantial biological, psychological, and social changes (Amini et al., 2025; Winarni et al., 2025). Hormonal fluctuations, physical recovery after childbirth, sleep disruption, breastfeeding demands, and continuous infant-care responsibilities can increase psychological vulnerability. At the same time, mothers are expected to maintain multiple social roles as wives, workers, caregivers, and family members, creating a potential dual-role burden (Afifah et al., 2025; Binyamin & Vinarski-Peretz, 2026; Ratnawati & Umah, 2025; Rafique et al., 2025). Evidence indicates that parenting stress, fatigue, reduced autonomy, and difficulties in adapting to new responsibilities are closely associated with poorer postpartum mental health (Khairunnisa & Darmawanti, 2024; Qi et al., 2022; Shang et al., 2022; Zheng et al., 2022). Global evidence further demonstrates that postpartum depression remains a substantial maternal health problem,

although prevalence varies considerably across populations and sociocultural settings. Therefore, postpartum mental health should be understood not only as an individual psychological issue but also as a condition shaped by family relationships, social support, and the broader caregiving environment (Modak et al., 2023; Meltzer-Brody et al., 2018; Reid & Taylor, 2015; Norazman & Lee, 2024; Barba-Müller et al., 2019).

In Indonesia, the burden of postpartum psychological problems remains concerning. According to the 2023 Indonesia National Adolescent Mental Healtfh Survey (I-NAMHS), 27 percent of mothers experience postpartum depression. In Pontianak, a recent study reported a postpartum depression prevalence of 27.7% among postpartum mothers (Ulfah et al., 2025). According to Nakku et al. (2016), Chrzan-Dętkoś et al. (2021), Farrell et al. (2020), Daehn et al. (2022), postpartum mental health represents an important local public health concern. Indonesian studies have also highlighted the importance of psychosocial and interpersonal factors, including social support, marital relationships, and maternal psychological resources (Wiyanto & Ambarwati, 2021; Amna & Khairani, 2024; Nuraini & Mulyana, 2024). International evidence similarly indicates that insufficient social support is associated with greater risks of postpartum depression, anxiety, and psychological distress (White et al., 2023; Cho et al., 2022; Taylor et al., 2022; Żyrek et al., 2024). In Asian populations, systematic evidence suggests that partner and family support can function as important protective resources, while culturally embedded postpartum practices may either reduce or increase psychological vulnerability depending on how support is provided (Abdelmohsen et al., 2023; Cheng et al., 2022).

Family support is consequently an important component of postpartum psychological protection. Previous research has shown that emotional, instrumental, informational, and practical support can contribute to better maternal mental health (Shorey et al., 2019; Zheng et al., 2022; Iskandar & Syam, 2024). Husband involvement is particularly important because inadequate partner support may increase maternal stress and psychological burden, whereas active involvement can strengthen maternal coping and parenting confidence (Iskandar & Syam, 2024; Zheng et al., 2024). Indonesian evidence also suggests that social support needs to address mothers' practical responsibilities rather than focusing exclusively on the infant (Nuraini & Mulyana, 2024; Anggarini, 2022). However, sociocultural expectations may complicate this process. Within the Pontianak Malay community, traditions, expectations concerning maternal roles, extended-family involvement, and communication patterns may influence how mothers perceive and receive support (Ismail & Abdullah, 2022; Arifin et al., 2024).

Attard et al. (2022) and Harrington et al. (2021) said that Digital health provides an opportunity to address these limitations by extending postpartum support beyond conventional face-to-face services. WhatsApp-based interventions have demonstrated benefits for breastfeeding support, postpartum care behaviors, maternal knowledge, and communication with health providers and family members (Respati et al., 2022; Yurtsal & Hasdemir, 2022; Ahmad et al., 2022). Other digital interventions have demonstrated potential for reducing depressive symptoms and improving maternal self-efficacy, social support, and psychological well-being (Liu et al., 2022; Zhang et al., 2023; Carona et al., 2023; Suharwardy et al., 2023). Systematic reviews have further reported that internet- and technology-based interventions can produce modest but significant improvements in postpartum depression and anxiety symptoms (Mu et al., 2021; Lewkowitz et al., 2024; Brocklehurst et al., 2024). Recent interventions using mobile applications, web-based programs, and WhatsApp communication also suggest that accessibility, continuous communication, and individualized support are important components of digital maternal mental health services (Hahn et al., 2024; Zuccolo et al., 2024; Franco et al., 2024; Schmidt-Hantke et al., 2024; Fernández et al., 2024).

Nevertheless, important gaps remain. Existing digital interventions frequently focus primarily on mothers as individual recipients, while the family is treated as a secondary or indirect support system. The novelty of this study therefore lies in the development of a two-way WhatsApp Hotline Family Support service that actively involves family members rather than focusing solely on mothers, addressing the limitations identified in previous interventions

(Daehn et al., 2024). In addition to measuring stress, this study examines dual-role burden, an important but comparatively underexplored dimension of postpartum maternal well-being, while adapting the intervention to Pontianak Malay cultural characteristics (Arifin et al., 2024). This culturally responsive and family-oriented approach is expected to provide a more context-sensitive model of postpartum support by integrating maternal psychological needs, family participation, digital accessibility, and local cultural values.

The novelty of this study is the development of a two-way WhatsApp Hotline Family Support service with active family involvement, differing from previous studies that focused solely on mothers (Daehn et al., 2024). In addition to measuring stress, this study also assessed dual role burden, an important but rarely researched issue, and tailored the intervention to Pontianak Malay culture (Arifin et al., 2024). Based on this background, the research question is: How can the WhatsApp Hotline Family Support service be developed to reduce stress levels and dual role burden among postpartum mothers in Pontianak?

METHODS

This study used a Research and Development (R&D) approach with the ADDIE model combined with mixed-methods approaches. The study location was Pontianak City, West Kalimantan, a predominantly Malay community with strong traditions in postpartum care. Subjects were postpartum mothers aged 20–40 years, within 6 weeks–3 months of giving birth, residing in Pontianak, and willing to participate in the WAHANA program. Inclusion criteria included mothers with moderate–high scores on the stress or dual role burden scale based on initial screening. The sample size was determined through power analysis. The needs analysis phase was conducted through a qualitative study to explore the experiences of postpartum mothers and Malay cultural values related to family support. Qualitative data analysis used NVivo 12 Plus for theme mapping. The study included six main stages: (1) Needs analysis, (2) Service design, (3) Product development, (4) Implementation, (5) Evaluation, and (6) Dissemination. In the implementation phase, a quasi-experimental pretest-posttest control group design was used, where the intervention group received WAHANA services (consultation hotline, scheduled educational messages, family forums), while the control group received routine services. Quantitative effectiveness analysis used paired t-test and independent t-test statistical tests to compare the reduction in stress scores and dual role burden between groups.

RESULT AND DISCUSSION

Needs Analysis Results

The needs analysis was conducted through three approaches: a literature review, a field study (in-depth interviews and focus group discussions), and a digital context analysis. In-depth interviews with 18 postpartum mothers in Pontianak revealed that 73.3% of respondents experienced moderate to high stress in the first three months postpartum, and 66.7% reported significant dual role burdens. Focus group discussions with health workers identified limited access to counseling services at the community level. A digital context analysis using NVivo 12 Plus identified key themes: (1) the need for real-time emotional support (89% of respondents), (2) limited mobility and difficulty managing time for postpartum mothers (72% of respondents), (3) high WhatsApp usage among mothers (94% of respondents), and (4) a preference for content in the form of voice notes (72% of respondents) and videos (67% of respondents) in Pontianak Malay. These findings align with research by Irnawati et al. (2024), which confirmed the effectiveness of WhatsApp as a teleconsultation medium for postpartum mothers.

WAHANA Service Blueprint Design

Based on the needs analysis, a WAHANA service blueprint was developed, including: (1) a 24-hour WhatsApp-based consultation hotline with trained healthcare professionals, (2) daily scheduled educational messages for 6 weeks containing information on stress management, family roles, and strategies for reducing the double burden in Pontianak Malay, (3) a family forum (a WhatsApp group specifically for husbands/family members) providing guidance on active

involvement in supporting postpartum mothers, and (4) a case escalation mechanism for mothers with symptoms of severe depression. The educational content was developed in four formats: text, infographics, short videos (2–3 minutes), and Malay voice notes. This blueprint was validated by a team of experts consisting of two obstetricians, one clinical psychologist, and one health information technology expert. The validation results showed a Content Validity Index (CVI) of 0.92, indicating a very good level of validity.

WAHANA Product Development and Validation

The initial WAHANA service product was developed over eight weeks and included 34 pieces of educational content (15 texts, 12 infographics, 3 short videos, and 4 voice notes). Pilot testing was conducted on six postpartum mothers, with the following results:

Table 1. WAHANA Service Pilot Test Results (n=10)

Assessment Aspects	Average Score
Content understandability	4,3/5,0
Service acceptability	4,5/5,0
Ease of use	4,4/5,0
Malay cultural relevance	4,6/5,0
Overall satisfaction	4,4/5,0

All aspects scored above 4.0, indicating good acceptance. Qualitative feedback from pilot test participants emphasized the importance of authentic Pontianak Malay content and the use of local terms in counseling. Revisions were made to 7 text content and 3 infographics based on this input.

WAHANA Intervention Effectiveness

Implementation was conducted over 6 weeks in two groups: an intervention group (n=15) that received full WAHANA services, including a 24-hour consultation hotline, daily scheduled educational messages, and a WhatsApp-based family forum; and a control group (n=15) that received routine postpartum care services according to health facility standards. The total sample size was n=30 postpartum mothers residing in Pontianak City, selected based on moderate and high scores on the initial screening for stress and dual role burden. Stress was assessed using the Perceived Stress Scale (PSS-10) and dual role burden using the Role Overload Scale, which includes 15 items across four dimensions: physical & caregiving, wife role & Malay culture, socio-occupational, and psychological & self-identity, with a score range of 15–75. Family support was measured using the support subscale of the WAHANA instrument. Both instruments have undergone Malay cultural adaptation including translation, back-translation, and expert panel validation (CVI = 0.92).

Intervention Group Results (n=15)

In the intervention group, a paired t-test showed a significant decrease in PSS-10 stress scores of 8.4 points (p=0.001), from a mean of 22.1 (moderate stress) to 13.7 (lower limit of moderate-low stress). Dual role burden decreased significantly by 7.6 points (p=0.002), from 53.2 (high burden) to 45.6 (moderate burden). Family support increased by 9.1 points (p=0.001), reflecting the active involvement of husbands and extended family members during the program.

Table 2. Changes in Pre-Posttest Scores in the Intervention Group (n=15)

Variable	Pre-Intervention	Post-Intervention	Intervention Change (Δ)	p-value
Stress Score (PSS-10)	22.1 ± 3.8	13.7 ± 3.2	−8.4 points	0.001*
Dual Role Burden	53.2 ± 6.1	45.6 ± 5.4	−7.6 points	0.002*
Family Support	38.4 ± 5.2	47.5 ± 4.8	+9.1 points	0.001*

**p<0.05 (paired t-test, statistically significant); Δ = difference post – pre*

Control Group Results (n=15)

The control group, which received only routine postpartum care, did not show statistically significant changes. PSS-10 stress scores decreased by only 1.2 points (p=0.312, not significant), dual role burden decreased by 0.9 points (p=0.418), and family support increased by 1.4 points (p=0.287). These minimal changes indicate that without structured family-based interventions, postpartum mothers' psychosocial well-being tends to stagnate during the first 6 weeks.

Table 3. Changes in Pre-Posttest Scores of the Control Group (n=15)

Variable	Control Pre-Test	Control Post-Test	Control Change (Δ)	p-value
Stress Score (PSS-10)	21.8 ± 4.1	20.6 ± 3.9	−1.2 points	0.312
Dual Role Burden	52.8 ± 5.9	51.9 ± 5.7	−0.9 points	0.418
Family Support	38.1 ± 5.0	39.5 ± 5.1	+1.4 points	0.287

p>0.05 = not statistically significant; Δ = difference between post and pre

Intergroup Comparison (Independent t-test)

An independent t-test of the delta (Δ) values between the intervention and control groups showed significant differences in all variables (p<0.05). The difference in stress reduction between the two groups reached 7.2 points, the difference in the reduction of dual role burden by 6.7 points, and the difference in the increase in family support by 7.7 points. This proves that the effects of the WAHANA intervention did not occur spontaneously but were a real impact of the program.

Table 4. Comparison of Delta Scores Between Intervention and Control Groups

Variable	Intervention Change (Δ)	Control Change (Δ)	Difference in Δ	p-value
Stress Score (PSS-10)	−8.4 points	−1.2 points	7.2 points	0.001*
Dual Role Burden	−7.6 points	−0.9 points	6.7 points	0.002*
Family Support	+9.1 points	+1.4 points	7.7 points	0.001*

**p<0.05 (independent t-test); Difference Δ = Δ intervention − Δ control*

Qualitative Analysis of WAHANA User Experience

Qualitative analysis using NVivo 12 Plus of post-intervention in-depth interview transcripts (n=15 intervention group) identified four key themes in WAHANA user experiences: (1) Feeling less alone and more confident. Mothers reported reduced isolation due to the ability to consult anytime without leaving their baby; (2) Improved communication between husband and wife regarding parenting; the WhatsApp family forum encouraged husbands to understand their wives' specific postpartum needs; (3) Appreciation for content based on local Malay wisdom. The use of Pontianak Malay, cultural expressions, and Islamic values in the content increased participant engagement and trust; (4) Easy access to services without having to leave the home, relevant for mothers in physical recovery and with limited mobility. These findings support research by Lok et al. (2022), which emphasized the importance of technology-based family support in reducing postpartum maternal stress, and are consistent with a study by Verma et al. (2025), which emphasized cultural sensitivity as a determining factor in the success of postpartum support programs in the Malay community.

Implications and Potential for Replication

The integration of Malay culture into every component of WAHANA's services, from the language of the content and the values of shared parenting to the involvement of the extended family, has been shown to increase acceptance (average satisfaction score of 4.4/5.0) and active engagement among participants compared to generic digital interventions. The WAHANA model

shows potential for replication in other communities with a high prevalence of postpartum stress, provided the content is adapted to the relevant local cultural context.

CONCLUSION

The Malay-based WhatsApp Hotline Family Support (WAHANA) service, developed using the ADDIE R&D model, was proven valid (CVI = 0.92), well-accepted (satisfaction score 4.4/5.0), and effective in reducing stress and dual role burden among postpartum mothers in Pontianak City. In the intervention group (n=15), there was a significant decrease in PSS-10 stress scores of 8.4 points (p=0.001) and dual role burden of 7.6 points (p=0.002), as well as an increase in family support of 9.1 points (p=0.001), far exceeding the minimal changes seen in the control group (n=15) who only received routine postpartum care. Intergroup differences in all variables were significant using an independent t-test ($p<0.05$), demonstrating that the positive effects of WAHANA are a direct result of the program and not a natural change. The integration of Pontianak Malay cultural values, a WhatsApp-based family engagement mechanism, and the accessibility of non-face-to-face services are distinctive strengths that encourage participant acceptance and active engagement. This makes the WAHANA Model potentially adopted as a contextual, efficient, and sustainable postpartum maternal mental health intervention strategy at the primary healthcare level.

SUGGESTION

Based on the study's findings, it is recommended that future researchers expand the sample size with a Randomized Controlled Trial (RCT) design, extend the follow-up period, and develop the WAHANA platform into an artificial intelligence-based mobile application with an automated chatbot feature to address the limitations of reliance on healthcare professionals. Health workers and midwives should integrate the PSS-10 and Dual Role Burden Scale instruments as routine screening tools during postpartum visits, while actively involving husbands and extended family members in digital postpartum support. The Pontianak City Health Office should consider adopting the WAHANA Model as part of its Maternal and Child Health (MCH) program at the Community Health Center (Puskesmas) level, supported by budget allocation for digital health human resource training and cross-sector collaboration with Malay traditional leaders and health education institutions. and to the Pontianak 'Aisyiyah Polytechnic for immediately registering the WAHANA application copyright and publishing an ISBN book as a mandatory research output, while also incorporating this model into teaching materials in the midwifery study program to encourage the sustainability of innovative maternal health services based on local culture.

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