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The Effect Of Health Promotion Based On The Analysis Of Educational Needs In The Postpartum Periodin Badung Regency, Bali

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ABSTRACT

Background: The postpartum period is a critical phase that requires thorough preparation beginning in pregnancy. An assessment of educational needs can enhance mothers' capacity to provide care. Few studies have explored educational materials and media tailored to mothers' needs; therefore, health education has not yet yielded optimal results. Methods: This was the second phase of a quasi-experimental study using a pretest-posttest design with a control group. A total of 200 participants were selected through quota sampling, consisting of 100 in the control group and 100 in the intervention group. The intervention group received education from healthcare providers using digital media, including an e-booklet and video, tailored to mothers' needs. Data were collected using a validated and reliable questionnaire. Data analysis was performed using the Wilcoxon test and the Mann–Whitney U test. Results: Knowledge among respondents in the intervention group was predominantly in the "good" category (94%) compared with the control group (76%), with a significant improvement (p=0.003). Attitudes in the intervention group were mostly "good" (91%), whereas in the control group, most respondents had "fair" attitudes (93%), showing a significant improvement (p=0.000). Self-efficacy in the intervention group was higher (92%) than in the control group (32%), also showing a significant improvement (p=0.000) in performing maternal and infant care. Conclusion: Health promotion based on an analysis of educational needs was proven effective in improving knowledge, attitudes, and self-efficacy among postpartum mothers in performing maternal and infant care. The use of digital technology–based educational materials can be integrated and further developed to better prepare women for the postpartum period.

Keywords: Health Promotion; Needs Analysis; Education; Postpartum

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INTRODUCTION

The postpartum period is the time that starts right after the baby is born and continues until six weeks (42 days). This is a critical time for the mother, newborn, partner, and family. However, during this period, maternal and newborn deaths and health problems remain high. Postpartum care services are an essential part of health care for mothers, newborns, and children. They are also important to achieve the Sustainable Development Goals (SDGs) in reproductive, maternal, and child health, including the goals of reducing maternal deaths and preventing avoidable newborn deaths (WHO, 2022).

Maternal mortality is one of the indicators used to measure the success of maternal health programs. Data from the Nutrition and Maternal and Child Health Program at the Ministry of Health shows that from 2019–2021, maternal deaths tended to increase, while from 2021–2023 the number of maternal deaths fluctuated. In 2023, the total number of maternal deaths in Indonesia was 4,482. Efforts to reduce the Maternal Mortality Rate (MMR) are focused on ensuring that every mother has access to quality health services. These include postnatal care for mothers and babies, special care and referrals in case of complications, and family planning services, including postpartum family planning (Ministry of Health RI, 2024).

The maternal mortality rate in Bali Province in 2023 was 63.9 per 100,000 live births, the lowest in the last five years. Since 2019, the maternal mortality rate increased to 69.7 per 100,000 live births, and in 2020 it rose again to 83.79 per 100,000 live births. The highest rate was in 2021, reaching 189.7 per 100,000 live births. In 2022, the rate decreased to 110.4 per 100,000 live births, compared to 2021.In absolute numbers, maternal deaths in Bali in 2023 were 40 cases. The highest number was in Denpasar City (9 cases), followed by Badung (8 cases), and Buleleng (7 cases). The main causes of maternal death were non-obstetric complications (40%), obstetric bleeding (28%), and hypertension during pregnancy, childbirth, and postpartum (12%) (Ministry of Health, Indonesia, 2024).

During the postpartum period, mothers are at risk of complications. Therefore, it is recommended to have four postpartum visits (complete KF). Similar to antenatal visits, postpartum visits also face gaps in continuity of use. According to the Ministry of Health of Indonesia (2023), the proportion of complete postpartum visits was only 26.8%. In the neonatal

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period, it is expected to have three neonatal visits, but only 45% of neonates received the complete visits.

The study conducted by Adams et al. (2023) found that the lack of essential information regarding physical and mental health care for mothers may lead to poor postpartum adjustment. Insufficient knowledge about warning signs, which are common causes of morbidity and mortality, further emphasizes this concern. This highlights the importance of understanding women's postpartum needs and the challenges in accessing quality postpartum care in order to design better and more effective interventions. One contributing factor to the lack of information is that postpartum mothers do not read the Maternal and Child Health (MCH) Handbook that has been provided. Research conducted by Mutiana Hani Zakia (2024), through a review of ten articles, showed that seven studies reported pregnant women utilized the MCH Handbook, while three studies indicated that pregnant women had not yet effectively used it. Another study by Maryam (2021) demonstrated that many postpartum cultural practices in society are considered inconsistent with health principles or may even negatively affect the health of postpartum mothers and their babies. According to Manurung (2021), mothers require information on prevention and care during pregnancy, childbirth, and the postpartum period. Furthermore, the study by Sendas and Freitas (2024) found that mothers did not feel adequately prepared to face the postpartum period. This research identified several unmet needs and emphasized the importance of sharing, support, care, and postpartum planning as essential requirements to improve the postpartum experience and the transition to parenthood.

Several studies on postpartum education, such as the research conducted by Njakatara et al. (2021), found that smart package health education for breastfeeding mothers significantly improved the self-efficacy of primiparous mothers in caring for newborns. In addition, Novita et al. (2020) investigated online breastfeeding assistance for postpartum mothers. According to the study by Nazari et al. (2018) in Bojnourd, Iran, the educational needs of postpartum mothers include physical recovery, sexual health, and mental well-being. Providing mothers the opportunity to choose the topics to be discussed was shown to increase their interest and satisfaction with the education provided, compared to when educational topics were predetermined by existing agendas. Furthermore, research by Masih and Balusamy (2022)

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demonstrated that structured educational programs are effective in improving postpartum mothers' knowledge, perceptions, and practices related to postpartum care and newborn care.

Many studies have examined postpartum care, particularly breastfeeding care, yet few have explored the educational needs of postpartum mothers. This research represents the second phase of a follow-up study. The first phase focused on exploring the educational needs of postpartum mothers, and qualitative analysis identified six themes: "educational needs regarding maternal care," "educational needs regarding infant care," "timing of information delivery," "methods of education delivery," "educational media," and "sources of information." The most highly needed educational materials for maternal care included breastfeeding (4.55±0.531), breast care (4.46±0.531), and mental health (4.45±0.584). For infant care, the most needed materials were immunization (4.59±0.493), recognition of signs and danger in newborns (4.55±0.685), and umbilical cord care (4.53±0.557). Mothers preferred online media and video as educational tools, with education provided during pregnancy (Runiari et al., 2023). Based on the identification of these specific educational needs and the conducted needs analysis, educational materials and media were subsequently developed using e-booklets and videos, with implementation during the third trimester of pregnancy. This study focuses on intervening to assess the effectiveness of educational materials and media in the postpartum period.

METHODS

Design

This study employed a quasi-experimental design using a pretest–posttest with control group approach. The intervention was conducted from July to October 2024.

Sample

The study population consisted of third-trimester pregnant women attending antenatal care visits at Kuta Utara Community Health Center and Kuta Selatan Community Health Center. Participants were selected using a quota sampling technique. A total of 200 participants were recruited, comprising 100 in the intervention group and 100 in the control group.

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Variabels

Maternal capacity in performing postpartum care was assessed through three variables: knowledge, attitudes, and self-efficacy regarding the postpartum period. These variables were measured both prior to and following the provision of health education.

Instruments

Data were collected using a knowledge, attitude, and self-efficacy questionnaire developed by the researchers. The questionnaire underwent validity and reliability testing with 30 respondents at Mengwi 1 Community Health Center. The validity test results showed $p < 0.05$, and the reliability test results were > 0.8, indicating that the questionnaire on knowledge, attitude, and self-efficacy was valid and reliable.

Data collection

Prior to the intervention, a pretest was administered to assess the mothers' knowledge, attitude, and self-efficacy. The health education was delivered by trained healthcare providers specializing in maternal and newborn postpartum care. Education sessions were conducted in groups for 20 minutes, after which participants were given the opportunity to review the materials through an e-booklet and watch demonstration videos on maternal and newborn care provided online. A posttest was conducted two weeks later in the intervention group. The control group received health education according to the standard procedures applied at the community health centers.

Data Analysis

To analyze differences in knowledge, attitude, and self-efficacy within each group, the Wilcoxon test was employed. Furthermore, to assess the intervention effect between groups, the Mann–Whitney U test was used.

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RESULTS

1. Characteristics of Respondents and Husbands

   a. Characteristics of Respondents and Husbands

Table 1 Characteristics of Respondents and Husbands

Respondent Characteristics	Intervention groups (n= 100)		Control group (n= 100)	
	Jml	%	Jml	%
Mother's age				
a. <20 years old	0	0	3	3%
b. 20-35 years old	97	97%	95	95%
c. >35 years old	3	3%	2	2%

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Mother's last education				
a. Completed Elementary School	0	0	5	5%
b. Completed Junior High School	16	16%	14	14%
c. Completed High School	53	53%	52	52%
d. Completed of PT	31	31%	29	29%
Mother's work				
a. Housewives	47	47%	69	69%
b. Civil Servants	1	1%	1	1%
c. Private	43	43%	20	20%
d. Self employed	9	9%	6	6%
e. Miscellaneous	0	0	4	4%
Paritas				
a. Primigravida	63	63%	40	40%
b. Multigravida	37	37%	60	60%
c. Grandemultigravida	0	0	0	0
Pregnancy checkpoints				
a. Public Health Center	65	65%	62	62%
b. Practice midwife	32	32%	4	4%
c. Practice Doctor	0	0	21	21%
d. Hospitals /clinics	3	3%	13	13%

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Frequency of Pregnancy Check-ups				
a. < 4 kali	16	16%	23	23%
b. ≥ 4 times	84	84%	77	77%
Gestational Age				
a. 28-31	60	60%	53	53%
b. 32-35	34	34%	38	38%
c. ≥ 36 weeks	6	6%	9	9%
Long married				
a. < 2 years	63	63%	54	54%
b. 2-5 years	24	24%	18	18%
c. > 5 years	13	13%	28	28%

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Birthing site plan				
a. Public Health Center	4	4%	15	15%
b. Practice midwives	1	1%	6	6%
c. Practicing physician	3	3%	8	8%
d. Hospitals /clinics	92	92%	71	71%

Characteristics of the Respondent's Husband	**Intervention group (n= 100)**	**Control group (n=100)**

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	Jml	%	Jml	%
Husband's age				
a. <20 years old	0	0	0	0
b. 20-35 years old	95	95%	85	85%
c. >35 year	5	5%	15	15%
Husband's last education				
a. Completed Elementary School	0	0	4	4%
b. Completed Junior High School	13	13%	8	8%
c. Completed High School	52	52%	55	55%
d. Completed Diploma/ Bachelor's Degree	34	34%	31	31%
e.Completed Master's Degree	1	1%	2	2%
Work				
a. Not Working	0	0	0	0
b. Civil Servants	5	5%	5	5%
c. Private	67	67%	63	63%
d. Self employed	27	27%	21	21%
e. Miscellaneus	1	1%	11	11%
Monthly Income (husband and wife)				
a. < IDR 3,300,000	25	25%	32	32%
b. ≥ IDR 3,300,000	75	75%	68	68%

Based on Table 1, the majority of mothers in both the intervention and control groups were aged between 20 and 35 years. Most respondents had completed senior high school as their highest level of education. The majority of respondents were housewives. In terms of parity, the intervention group was predominantly primigravida, while the control group was predominantly multigravida. Most antenatal care visits were conducted at community health centers, with the highest frequency of visits also occurring at these facilities.

The majority of respondents had a frequency of antenatal care visits of four times or more. Most pregnancies were within the gestational age range of 28–31 weeks. The majority had been married for less than two years. Most respondents planned to deliver in hospitals or clinics. The largest proportion of respondents' husbands were aged 20–25 years. The majority of husbands had completed senior high school as their highest level of education and were employed as private-sector workers. Most families reported a monthly income of ≥ IDR 3,300,000.

2. Respondents' Knowledge, Attitudes and Self-Efficacy in the Intervention and Control Group Table 2. Results of Analysis of Respondents' Knowledge, Attitudes and Self-Efficacy In the Intervention Group and the Control Group

Variabel group Intervention	**Pretest (n=100)**	**Posttest (n=100)**	***pvalue***
Knowledge a. Good b. Enough c. Less	24(24%) 51(51%) 25(25%)	94(94%) 6(6%) 0	*Pvalue =0.000 (<0.05)* Positive rank= 74 Ties= 26
Attitude a. Good b. Enough c. Less	 7(7%) 93(93%) 0	 91(91%) 9(9%) 0	*Pvalue =0.003 (<0.05)* Positive rank= 84 Ties= 16
Self-Efficacy a. Good b. Enough c. Less	 50(50%) 44(44%) 6	 98(98%) 2(2%) 0	*Pvalue =0.001 (<0.05)* Positive rank= 12 Ties= 88
Variabel Group control	**Pretest (n=100)**	**Posttest (n=100)**	***pvalue***
Knowledge a. Good b. Enough c. Less	33 (33%) 67 (67%) 0	76(76%) 24(24%) 0	*Pvalue =0.004 (<0.05)* *Positive rank= 63* *Ties= 37*
Attitude			*Pvalue =0.003 (<0.05)*

a. Good	0	0	*Positive rank= 9*
b. Enough	84 (84%)	93(93%)	*Ties= 91*
c. Less	16(16%)	7(7%)	

Self-Efficacy a. Good b. Enoug c. Less	20(20%) 80(80%) 0	32(32%) 68(68%) 0	*Pvalue =0.001 (<0.05)* *Positive rank= 12* *Ties= 88*

Referring to Table 2, respondents' knowledge before the intervention was mostly in the moderate category (51%), which increased to the good category (94%) after the intervention. There was a significant difference between knowledge before and after the intervention (p-value = 0.000, <0.05). Respondents' attitudes before the intervention were mostly in the moderate category (93%), which increased to the good category (91%) after the intervention. A significant difference was found between attitudes before and after the intervention (p-value = 0.003, <0.05). Self-efficacy before the intervention was partly in the good category (50%) and increased to almost all respondents (98%) having good self-efficacy after the intervention. There was a significant difference in self-efficacy before and after the intervention (p-value = 0.001, <0.05).

Respondents' knowledge before the intervention was predominantly in the moderate category (67%), which increased to the good category (76%) after the intervention. A significant difference was observed between knowledge before and after the intervention (p-value = 0.004, <0.05). Respondents' attitudes prior to the intervention were mostly in the moderate category (84%), and after the intervention remained predominantly in the moderate category (93%). Nevertheless, there was a significant difference between attitudes before and after the intervention (p-value = 0.003, <0.05). Self-efficacy before the intervention was largely in the moderate category (80%) and remained predominantly in the same category after the intervention. However, a significant difference was identified between self-efficacy before and after the intervention (p-value = 0.001, <0.05).

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3. Differences in Knowledge, Attitudes and Self-Efficacy in the Intervention Group and the Control Group Table 3. Results of Analysis of Respondents' Knowledge, Attitudes and Self-Efficacy In the Intervention Group and the Control Group

Variabel	Intervention Groups (n=100)	Control Group (n=100)	*pvalue*
Knowledge	94(94%)	76(76%)	*Pvalue =0.003*
a. Good			*(<0.05)*
b. Enough	6(6%)	24(24%)	
c. Less	0	0	

Attitude a. Good b. Enough c. Less	91(91%) 9(9%) 0	0 93(93%) 7(7%)	*Pvalue =0.000 (<0.05)*
Self-Efficacy a. Good b. Enough c. Less	92(92%) 8(8%) 0	32(32%) 68(68%) 0	*Pvalue =0.000 (<0.05)*

Based on Table 3, there was a significant difference (p = 0.003) in respondents' knowledge between the intervention and control groups. Knowledge in the intervention group was categorized as good in 94% of respondents, which was higher compared to 76% in the control group. A significant difference was also found (p = 0.000) in respondents' attitudes between the intervention and control groups. In the intervention group, 91% of respondents demonstrated good attitudes, whereas in the control group, the majority of respondents (93%) remained in the moderate category. Furthermore, a significant difference (p = 0.000) was identified in respondents' self-efficacy between the intervention and control groups. In the intervention group, 92% of respondents had good self-efficacy, which was substantially higher compared to 32% in the control group.

DISCUSSION

The results of this study are consistent with the findings of Alkalash et al. (2022), which showed that 57% of participants had good knowledge, 79.3% demonstrated a positive attitude, and approximately 51.2% and 64.8% of the studied groups reported good practices regarding the postpartum care services provided to them and their newborns.

In this study, health education was provided to postpartum mothers using booklet and video media. Both media were found to be highly effective in improving the respondents' knowledge, attitudes, and self- efficacy. This finding is supported by the study of de Sousa et al. (2022), which reported an increase in knowledge from 70.82% to 92.97%. The study concluded that educational videos are effective for participants in acquiring knowledge about newborn care and can assist nurses in conducting health education activities. Another study conducted by

Refiani Anwar et al. (2023) compared two intervention groups, namely video and booklet media, with each group consisting of 18 respondents. The results showed significant differences in knowledge and interest before and after the intervention using video media (p-value = 0.000), as well as before and after the intervention using booklet media (p-value = 0.000). Furthermore, video media was found to bemore effective than booklet media in improving mothers' knowledge and interest.

Self-efficacy is one of the most influential aspects of self-knowledge in everyday human life. This is because self-efficacy affects individuals in determining the actions they take to achieve certain goals, including their expectations of potential events they may encounter. According to the study by Botha et al. (2020), self-efficacy is influenced by employment status, number of children, and perception of infant fussiness. Mothers who were unemployed or only worked part-time reported higher scores across all categories of parental self-efficacy compared to those who worked full-time ($p < 0.001$). A greater number of children (≥ 3) was positively associated with both self-efficacy and parental satisfaction. Conversely, mothers who reported unsuccessful breastfeeding initiation also reported significantly lower scores in parental self-efficacy and parental satisfaction across all categories. Parental self-efficacy and satisfaction with child-rearing were found to be relatively high during the first few days postpartum. Meanwhile, age, marital status, education, and mode of delivery were not associated with either self- efficacy or parental satisfaction.

Another study consistent with the findings of this research was conducted by Li et al. (2022), which aimed to describe breastfeeding self-efficacy among postpartum mothers in rural China and to identify the determinants of breastfeeding self-efficacy using Dennis's breastfeeding self-efficacy framework. The results indicated that positive attitudes, family support for breastfeeding, and social support contributed significantly to breastfeeding self-efficacy.

In this study, education was provided regarding newborn care and maternal care during the postpartum period. Another study that also implemented educational interventions was conducted by Njakatara et al. (2021). The study found that the breastfeeding education package significantly influenced the self-efficacy of primiparous mothers in caring for their newborns, with scores increasing from 3.51 before the intervention to 5.49 after the intervention ($p = 0.001$). The increase in self-efficacy in the intervention group was significantly higher compared to the control group ($p = 0.001$). However, no significant association was found between social support and self-efficacy in either group ($p > 0.05$).

Another supporting study conducted by Mulyati et al. (2023) showed that the majority of mothers had low interest (88.5%) in using postpartum contraception before receiving counseling accompanied by

audiovisual media. After the intervention, the respondents' interest increased to a high level (92.3%) among postpartum mothers in Samboja. The use of audiovisual media in counseling strategies offers advantages, as it can provide complete and easily understood information, thereby encouraging maternal interest.

A study on The Effect of Educational Videos About Newborn Baby Care on the Knowledge Level of Postpartum Mothers (Purnamayanthi & Adhiestiani, 2022) found that educational videos are an effectivehealth education method to improve mothers' knowledge in caring for newborns. Data analysis using the Wilcoxon Matched Pairs Test showed a p-value of 0.000 < 0.05. Online health education initiated during pregnancy and continued with counseling up to three months postpartum was associated with increased maternal confidence in parenting and newborn care, which in turn resulted in better infant health outcomes. Online parenting training and counseling can be considered an alternative to standard care, particularly when face-to-face support is not available (Bilgiç & Bozkurt, 2025).

The limitation of this study is that it did not analyze the capacity of mothers to perform postpartum care, as the study sample consisted of third-trimester pregnant women. In addition, not all postpartum mothers had access to technological devices such as smartphones or adequate internet networks, which restricted the reach of technology-based education. The digital literacy level of some postpartum mothers was also low, requiring additional guidance in using educational applications. To address these challenges, technology-based educational programs can be integrated with face-to-face sessions or small group mentoring to ensure that all participants are able to engage effectively.

Implications of the research

The findings of this study provide empirical evidence that technology-based interactive educational approaches can serve as an innovative solution to improve maternal health awareness during the postpartum period. This method is not only relevant in the digital era but also has the potential to be widely adopted as part of public health education programs. The improvements in knowledge and behavioral changes among postpartum mothers demonstrate that this approach is feasible to be integrated into routine health education programs in healthcare facilities. Technology-based education also offers the potential to reach wider communities through applications that can be accessed anytime and anywhere.

The researchers recommend further development of technology-based educational applications with richer content and more diverse interactive features. In addition, long-term studies are needed to evaluate the impact of such education on the incidence of postpartum complications. Future research may also consider additional variables such as differences in

mothers' social, cultural, and economic backgrounds in order to design more inclusive and effective educational programs.

CONCLUSION

The development of a health promotion model through an analysis of educational needs has proven effective in improving mothers' knowledge, attitudes, and self-efficacy regarding maternal and infant care during the postpartum period. Online educational media, such as e-booklets and videos, provide mothers with greater opportunities to read and understand information about the postpartum period, thereby enhancing their knowledge, attitudes, and self-efficacy. The timing of education delivery is most appropriate during the third trimester of pregnancy, enabling mothers to better prepare themselves for the postpartum period.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest. All authors participated from the conception to the final write up of the study. All authors read and approved the final manuscript.

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ETHICAL CLEARANCE

Ethical approval was obtained from the Health Research Ethics Committee of the Health Polytechnic of the Ministry of Health in Denpasar, Bali Province, Indonesia (Number DP.04.02/F.XXXII.25/0562/2024). Before data collection began, written informed consent was obtained from all participants.

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