

## **The Effect of Postpartum Nutrition Flipbook Media On The Level of Knowledge of Postpartum Mothers In Boyolali, Indonesia**

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### **ABSTRACT**

**Background:** The birth rate in Indonesia continues to rise among women aged 20–29 years, then declines afterward. Postpartum mothers are prone to anemia (22-80%), postpartum infections (5-7%), and the culture of abstinence from food is still high (95%). Inadequate nutrition during the postpartum period can have an impact on the mother's recovery and the baby's health. However, many postpartum mothers still lack understanding of the importance of nutrition during this period. Flipbook media as an interactive digital educational tool can be a solution to increase the knowledge of postpartum mothers. Preliminary studies at Asy Syifa Sambi Boyolali Hospital showed that some postpartum women had a low level of understanding regarding their nutritional needs. Therefore, this study aims to analyze the effect of flipbook media on increasing the knowledge of postpartum mothers about postpartum nutrition

**Methods:** The research design is quasy experiment with pretest-postest design. Sample selection with purposive sampling, which is 40 respondents. The inclusion criteria of this study were postpartum mothers on day 1-3, stable condition, and had a smartphone. Meanwhile, the exclusion criteria of this study were refusal to participate. Data analysis using the Wilcoxon test.

**Results:** The results showed that there was an effect of the postpartum nutrition flipbook on the level of knowledge of postpartum mothers at Asy Syifa Sambi Boyolali Hospital before and after the intervention with a p value of  $0.000 < 0.05$

**Conclusion:** Health workers are expected to take advantage of the results of this study by using flipbook media as a means of counseling for postpartum mothers.

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**Keywords:** Flipbook media, Knowledge, Nutrition, Postpartum mothers

## **INTRODUCTION**

The birth rate in Indonesia continues to rise among women aged 20–29 years, then declines afterward. The prevalence of postpartum anemia remains high—ranging from 22% to 50% in developed countries and 50% to 80% in developing countries. The birth rate in Indonesia continues to rise among women aged 20–29 years, then declines afterward (Kementrian Kesehatan 2025). The epidemiology of puerperal infections is still not well understood; however,

infections affect approximately 5–7% of postpartum mothers, with higher rates observed in those who undergo caesarean delivery (Neef et al. 2024). In Indonesia, approximately 95% of the population still holds cultural beliefs related to food restrictions and taboos, with 4.4 million out of 5.1 million postpartum mothers influenced by these beliefs (Andriyani and Susilowati 2022). Additionally, 27.7% of pregnant women experience anemia, 16.9% suffer from chronic energy deficiency, and 17.1% have vitamin A

deficiency conditions that contribute to postpartum vulnerability (Kemenkes 2023).

Several factors are closely linked to nutritional concerns during the postpartum, including anemia, heightened risk of infection and cultural food restrictions. Nutrition interventions for postpartum women are often overlooked within the umbrella of maternal nutrition (U. Kemenkes 2023). The postpartum refers to the phase of recovery following childbirth, lasting approximately 6–8 weeks, during which a woman's reproductive organs return to their pre-pregnancy state (Kemenkes 2023). This is a critical time requiring focused attention, as postpartum mothers commonly face physical and emotional recovery challenges. However, many remain unaware of the essential role of nutrition during this period.

One effective strategy to improve puerperal nutritional knowledge is through accessible and engaging education. Flipbook media presents health information in a visual and interactive format, making it easily accessible, reusable, and durable. These features are expected to stimulate learning interest among postpartum mothers (Juliani and Ibrahim 2023).

In the digital era, postpartum mothers are increasingly familiar with the use of smartphones and the internet. A 2023 survey conducted by the Indonesian Internet Service Providers Association revealed that 51% of women of reproductive age in Indonesia access the internet via smartphones. This trend presents an opportunity to integrate digital media such as flipbooks into postpartum health education (APJII 2024).

A preliminary study at Asy Syifa General Hospital over the past three months reported that 7.6% of puerperal women experienced anemia, 21% had a BMI below normal, and 4% experienced delayed wound healing. A survey involving five puerperal women showed that three of them lacked awareness of the benefits and risks related to postpartum nutrition, and some families still held traditional food taboos. The remaining two women understood the importance of nutrition but struggled to implement it. Asy Syifa Sambu Hospital, as a healthcare

provider, bears the responsibility to deliver appropriate education. However, no digital flipbook-based nutrition education has yet been implemented. Therefore, this study aims to analyze the effect of flipbook media on enhancing the knowledge of puerperal women about postpartum nutrition.

## **METHOD**

This research was conducted from January to February 2025 involving 65 postpartum mothers at Asy Syifa Sambu Boyolali Hospital. The sample was selected based on the average number of postpartum patients treated at the hospital each month. The sample size was determined using Slovin's formula with a 10% margin of error, resulting in 40 respondents.

First, the approval of the ethics committee of the university was obtained. After explaining the study objectives to the mothers and obtaining written consents (with regard to ethical principles for medical research), sampling was performed. The inclusion criteria were as follows: 1) Postpartum mothers in their first to third day of recovery admitted to the hospital, 2) Stable health condition, willingness to participate (signed informed consent), 3) Access to technology devices (smartphone/tablet). Mothers with serious health complications, cognitive or mental impairments, not being able to follow the full intervention or not being able to use technology and refused to sign the informed consent, were excluded from the research.

The instrument in this study uses a questionnaire used in this study which is a questionnaire adopted from previous research, with the title The Effect of Booklet Media on Nutritional Knowledge in Postpartum in the Cigalontang Health Center Working Area in 2021 (Nuryanti 2021). This questionnaire consists of 15 questions with True or False answer options. Administer a pre-test questionnaire to measure the initial level of knowledge then use the Postpartum Nutrition Flipbook to educate postpartum women. Provide a guide sheet or digital access to the flipbook and send it to

whatsapp so postpartum mothers can review it at home. 15 minutes, administer the same questionnaire (post-test) to measure changes in knowledge.

Knowledge levels were categorized as follows: good (76–100%), simply (56–75%), and less (<56%). Data were analyzed using SPSS, and the Wilcoxon test was applied. A p-value less than 0.05 was considered statistically significant. The study received ethical approval by KEPK (Health Research Ethics Committee) Kusuma Husada University Surakarta, namely 2467/UKH.L.02/EC/XII/2024.

## RESULTS

Table 1 Characteristics of Respondents Based on the Age, Religion, Education and Jobs of Postpartum Mothers at Asy Syifa Sambi Boyolali Hospital

No	Characteristics	Total	Percentage
1	Age		
	< 20 years	3	7,5
	20-35 years	34	85
	> 35 years	3	7,5
	<b>Total</b>	<b>40</b>	<b>100</b>
2	Religion		
	Muslim	37	92,5
	Christian	3	7,5
	<b>Total</b>	<b>40</b>	<b>100</b>
3	Education		
	Junior High School	4	10
	Senior High School	20	50
	Diploma 1	1	2,5
	Diploma 3	11	27,5
	Bachelor	4	10
	<b>Total</b>	<b>40</b>	<b>100</b>
4	Jobs		
	Housewife	16	40
	Students	1	2.5
	Casual Laborer	1	2.5
	Employee	16	40
	Self-employee	6	15
	<b>Total</b>	<b>40</b>	<b>100</b>

The characteristics of respondents showed that the majority were aged 20-35 years as many as 34 respondents (85%).

Characteristics of respondents based on the religion of the postpartum women showed that the majority were Muslim as many as 37 respondents (92.5%). Characteristics of respondents based on education of postpartum mothers showed that the majority of postpartum mothers' education was senior high school as many as 20 respondents (50%). Characteristics of respondents based on the occupation of postpartum mothers showed that the majority were housewives as many as 16 respondents (40%) and private employees as many as 16 respondents (40%) (Table 1).

Table 2 Level of Knowledge Before Being Given Media Flipbook Nutrition of the Postpartum Period to Postpartum Mothers at Asy Syifa Sambi Boyolali Hospital

No	Knowledge Level	Total	Percentage
1	Less	16	40
2	Simply	13	32,5
3	Good	11	27.5
<b>Total</b>		<b>40</b>	<b>100</b>

The level of knowledge before being given the media flipbook of postpartum nutrition to the majority of postpartum mothers is less knowledge as many as 16 respondents (40%) (Table 2).

Table 3 Level of Knowledge After Being Given Media Flipbook Nutrition of the Postpartum Period to Postpartum Mothers at Asy Syifa Sambi Boyolali

No	Knowledge Level	Total	Percentage
1	Less	0	0
2	Simply	4	10
3	Good	36	90
<b>Total</b>		<b>40</b>	<b>100</b>

The level of knowledge after being given a media flipbook of postpartum nutrition to postpartum mothers is mostly good knowledge as many as 36 respondents (90%) (Table 3).

the increase in motivation (Nursalam 2015).

The results of the study regarding the characteristics of respondents based on the religion of postpartum mothers showed that 37 respondents (92.5%) were Muslim and 3 respondents (7.5%) were Christian, so it can be concluded that the research subjects were dominated by postpartum mothers with Islamic religion.

The results of the study regarding the characteristics of respondents based on the education of postpartum women showed that the education of postpartum women showed junior high school as many as 4 respondents (10%), senior high school as many as 20 respondents (50%), D1 as many as 1 respondent (2.5%), D3 as many as 11 respondents (27.5%) and S1 as many as 4 respondents (10%). The higher the level of education, the easier it is for them to accept and develop knowledge and technology, so that it will increase productivity which will ultimately improve family welfare (Fitria Dhirisma and Idhen Aura Moerdhanti 2022; Nursalam 2015).

The results of research on the characteristics of respondents based on the work of postpartum mothers showed that housewives were 16 respondents (40%), students were 1 respondent (2.5%), casual daily laborers were 1 respondent (2.5%), private employees were 16 respondents (40%) and self-employed were 6 respondents (15%). The results of this study indicate that the majority of respondents work as private employees. Highly educated workers have better motivation because they broader knowledge and insights compared to workers who have low education (Yasa1 and Mayasari 2022).

#### **B. Level of Knowledge Before Being Given Media Flipbook Nutrition of the Postpartum Period Against the Level of Knowledge of Postpartum Mothers at Asy Syifa Sambi Boyolali Hospital**

Table 4 The Effect of Postpartum Nutrition Flipbook Media on the Knowledge Level of Postpartum Mothers use Wilcoxon test

Knowledge	Before (n=40) Total (%)	Sesudah (n=40) Jumlah (%)	Nilai P
Less	16 (40%)	0 (0,0%)	.000
Simply	13 (32,5%)	4 (10%)	
Good	11 (27,5%)	36 (90%)	

The results of the Wilcoxon Sign Rank Test in this study obtained a significance value of 0.000, which value is  $< 0.05$  ( $p < 0.05$ ) indicating that  $H_0$  is rejected and  $H_a$  is accepted, which means that there is a difference in the level of knowledge before being given the media flipbook of postpartum nutrition compared to the level of knowledge after being given the media flipbook of nutrition. This means that there is an effect of postpartum nutrition flipbook media on the level of knowledge of postpartum mothers at Asy Syifa Sambi Boyolali Hospital (Table 4).

## **DISCUSSION**

### **A. Characteristic of Respondent**

Based on the results of the analysis, the characteristics of respondents based on the age of the postpartum mother showed that the age of  $< 20$  years as many as 3 respondents (7.5%), ages 20-35 years as many as 34 respondents (85%) and age  $> 35$  years as many as 3 respondents (7.5%). The results of this study indicate that the majority of respondents were 20-35 years old. This is in accordance with the government's efforts in the safe motherhood program in reducing "4 too" namely pregnancy too young, too old, too often and too much. According to previous study, older age is generally more responsible and more careful than younger age. This is likely because the younger ones are less experienced. According to age / age is closely related to the level of maturity or maturity of a person. further, it will also increase one's ability to make decisions, control emotions, think rationally, and tolerate the views of others so that it also affects

As many as 16 respondents (40%), simply as many as 13 respondents (32.5%) and less as many as 11 respondents (27.5%). The results of this study indicate that the majority of respondents are less knowledgeable. Flipbook media has proven effective in increasing respondents' postpartum nutrition knowledge. Flipbooks provide an attractive appearance, are not boring, are easy to use independently, and are used on smartphones (Khotimah et al. 2023). Flipbook media has advantages including practical and inexpensive, environmentally friendly, material becomes easy to understand, increases reading interest, makes it easy to convey material and easy to operate (Khotimah et al. 2023; Salsabila, Safitri, and Suchyadi 2023).

**C. Level of Knowledge After Being Given Media Flipbook Nutrition of the Postpartum Period Against the Level of Knowledge of Postpartum Mothers at Asy Syifa Sambi Boyolali Hospital**

The results showed that the level of knowledge after being given the media flipbook of postpartum nutrition showed good as many as 36 respondents (90%), simply as many as 4 respondents (10%) and less as much as 0 respondents (0%). The results of this study indicate that the majority of respondents are well informed. Previous research shows that the factors that influence the success of health education include educators (facilitators), curriculum, learner conditions, organizational processes, facilities that are used and methods and media used (PH, Yulianto, and Hermanto 2018). Media learning is able to influence the effectiveness of learning so as to increase students in learning and be able to help increase the absorption of material and focus knowledge information (Tika Aprilia, Sunardi 2017).

**D. The Effect of Postpartum Nutrition Flipbook Media on the Level of Knowledge of Postpartum Mothers at Asy Syifa Sambi Boyolali Hospital**

The results of the analysis of the effect of flipbook education on postpartum nutrition on the level of knowledge of postpartum women with the Wilcoxon Sign Rank Test showed that there was an increase in the average between the pretest average of 66.55 increased in the posttest to 86.43 with a significance value of 0.000 which value  $<0.05$  ( $p < 0.05$ ) which indicates that  $H_0$  is rejected and  $H_a$  is accepted. It means that there is an effect of flipbook education on postpartum nutrition on the level of knowledge of postpartum women at Asy Syifa Sambi Hospital before and after intervention.

Knowledge is a very important domain in shaping a person's behavior or actions (Octaviana and Ramadhani 2021; Yuliana and Hakim 2020). Increased knowledge of postpartum women does not always lead to changes in behavior, but there has been much evidence of a positive relationship between the two. Changes in one's behavior occur, one of which is because someone knows about good behavior and the benefits of that behavior (Darsini, Fahrurrozi, and Cahyono 2019; Febryani, Rosalina S, and Susilo 2021; Sari 2018).

**CONCLUSION**

The use of flipbook media tends to make it easier for postpartum mothers to understand the content of the information because the information contained in the flipbook tends to make it easier for postpartum mothers to understand the content of the information. The results of the effectiveness test of the use of digital flipbook-based teaching materials in the learning process show the results that these teaching materials can increase the effectiveness of learning.

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