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Development of an Education Model for Increasing Husbands' Knowledge about Exclusive Breastfeeding in Makassar City

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ABSTRACT

Husbands' knowledge about exclusive breastfeeding (EB) is still low; this causes a lack of support for breastfeeding mothers, which results in low coverage of exclusive breastfeeding. Purpose: to analyze the effect of developing an exclusive breastfeeding education model on increasing husbands' knowledge. The Method of study is a combination of research and development (R&D), Borg and Gall, quasi-experimental, non-equivalent control group design. Population of husbands of pregnant women: sample, husbands of pregnant women who check their pregnancies at the Community Health Center in the third trimester. Purposive sampling of 60 people was divided into two groups; the intervention group received an exclusive breastfeeding education module plus the MCH book, and the control group received the MCH book, with knowledge measurement (pre-test) in the two control groups. Intervention and post-test were carried out once a week for 4 weeks. Data analysis used the Wilcoxon signed-rank test and the Mann-Whitney test. The Results of the study show that there is an effect of giving exclusive breastfeeding education modules on husbands' knowledge, with an overall post-test p-value of 0.000 < 0.05. There was no effect of giving the MCH handbook to the husband's knowledge, p-value 0.391> 0.05. There were differences in knowledge in the two groups, with the mean ranks greater in the intervention group, namely pre-test 32.67 > 28.33, post-test 1 37.35 > 23.65, post-test 2 41.15 > 19.85, and post-test 3 43.78 > 17.22. There is a difference in knowledge between the intervention and control groups. The exclusive breastfeeding education module increases husbands' knowledge about the importance of breastfeeding, especially exclusive breastfeeding. Conclusion: The exclusive breastfeeding education module increases husbands' knowledge about the importance of breastfeeding, especially exclusive breastfeeding, to be used as a health promotion medium in healthcare facilities.

Keywords: Educational module; exclusive breastfeeding; husband; knowledge

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INTRODUCTION

Exclusive breast milk (breast milk) is milk that is given to babies for 6 months without the addition of other fluids. [1-5] Data from the World Health Organization (WHO) shows that exclusive breastfeeding for infants aged 0-6 months is still 44% of the target of 50% in 2025. [6] Basic Health Research Data (RISKESDAS) 2021 shows that 52.5% of 2.3 million babies under 6 months are exclusively breastfed and many developing countries have low coverage in exclusive breastfeeding such as Indonesia at 30.4% and breastfeeding continuity is only 50.4% until the age of 2 years. [7]

The percentage of exclusive breastfeeding for infants in 2019 was 70.52%, in 2020 it was 76.21%, and in 2021 it was 76.43%. [8] From this data, it shows that in South Sulawesi there is an increase in exclusive breastfeeding. However, in contrast, health conditions of children still indicate many cases of low birth weight (35.2%), infections (3.4%), and asphyxia (27.4%). This highlights the need for targeted educations efforf for husbands, families and health workers during the first neonatal visit (KN1) to further improve exclusive breastfeeding coverage. Of the 45 health centers in Makassar City, the Kapasa Health Center is the lowest coverage of exclusive breastfeeding for babies in the first 0-6 months, with only 124 babies (26.11%) out of 425 babies being exclusively breastfed. [9]

Early breastfeeding is very important for the survival of the children and to protect rhem from various infectious diseases, such as diarrhea and pneumonia, which can also impact the chil's development and health leading to risk such as obesity, dependency, lower intelligence, malnutrion, dental caries, and emotional difficulties in adulthood. [10,12] Other studies have shown that early initiation of breastfeeding and breast milk can reduce or prevent the development of NOD2 polymorphism in infats, which increases susceptibility to gastrointestinal infections. [13,14]

Exclusive breastfeeding is mandated by Government Regulation No.33 of 2012 which states that every mother who gives birth must give exclusive breastfeeding to her baby. However, the implementation of this policy has not been sufficient to increase breastfeeding rates significantly. [15] Support from husbands and families is very important for mothers in providing exclusive breastfeeding. [16,17] A well-informed husband is more likely to support his wife and encourage her to continue breastfeeding. [18] A study found that one of the factors contributing to low exclusive breastfeeding coverage was lack of support from husbands, especially among those with low education-only 44% of them supported their wives to exclusively breastfeed. [(19)]

Improving husbands' knowledge of their role in supporting exclusive breastfeeding showed a significant impact. [(20, 21, 22)]. Research by [22] report that husbands in the intervention group received structured education on their role in supporting exclusive breastfeeding, resulting in a significant increase in their knowledge ($p = 0.000$) and a substantial increase in the rate of exclusive breastfeeding among mothers (from 12.5% to 70%). These findings underscore the effectiveness of the educational module designed for husbands in increasing their involvement and positively impacting breastfeeding practices. This indicates the need for a specialized educational module on exclusive breastfeeding designed specifically for husbands to improve their understanding and engagement. Although various

government programs have been introduced, including the use of MCH books, the content is still general and not sufficiently targeted to fathers.

Field data shows that the low rate of exclusive breastfeeding in Puskesmas Kapasa is also caused by limited support from husbands who mostly work in industrial factory areas so they cannot accompany their wives during antenatal visits. One solution that can be done is to use educational media in the form of modules. Modules serve as a self-learning tool that allows individuals to obtain information with minimal assistance from counselors. [23, 24]

The purpose of this study was to analyze the effect of educational module intervention on husband's knowledge about exclusive breastfeeding in the working area of Makassar City Health Office. This is expected to be a reinforcing factor in increasing exclusive breastfeeding rates which in turn can contribute to reducing child mortality in Indonesia. The integration of the educational module is proposed to be implemented through print media on maternal and child health in health centers in Makassar city.

The main problem underlying this study is the lack of knowledge of husbands about exclusive breastfeeding, especially in areas with low exclusive breastfeeding coverage such as in Puskesmas Kapasa, Makassar. This low level of knowledge results in limited support for their wives in breastfeeding practices. Although there are general educational materials such as MCH books, they are not sufficient to meet the specific educational needs of husbands. Therefore, there is a critical need for the development of focused and effective educational modules that can improve husbands' awareness, attitudes and engagement in supporting exclusive breastfeeding.

METHOD

The research method is quantitative research, while the research design uses a combination of research and development (R&D) of the Borg and Gall method and the quasy-experimental method with a non-equivalent control group design which aims to assess the influence of certain treatments on a variable. This study uses non-probability sampling, which is a purposive sampling technique, which is sampling with consideration of criteria determined by the researcher. This study involved two groups, namely the intervention group given the module and the control group given the Maternal and Child Health (MCH) book. Before the intervention, knowledge measurement (pre-test) was carried out for both the intervention group and the control group. Every week, a post test is carried out for 3 weeks in each group.

This research was conducted at two primary health centers, namely Kapasa and Pampang Health Centers in Makassar, South Sulawesi. These locations were selected due to their relatively low exclusive breastfeeding coverage compred to other health centers in Makassar. In Kapasa Health Center, only 124 (26.11%) out of 475 registered infants received exclusive breastfeeding. Data for Pampang Health Center can be found at 185 (37%) infants received exclusive. This highlights the urgent need for

educational interventions involving husbands to improve their understanding and support for exclusive breastfeeding. The population of this study is all husbands of pregnant women in the 3rd trimester who are in the Kapasa and Pampang Health Center areas from March to April 2023.

The educational module used in this study was developed through Focus Group Discussions (FGDs) with stakeholders. The module was also based on national guidelines from the Indonesian Ministry of Health and supported by recent scientific literature on the role of husbands in promoting exclusive breastfeeding. The module consists of four main topics, namely the benefits of exclusive breastfeeding, the role of husbands in supporting breastfeeding, breastfeeding techniques, and myths and facts about breastfeeding.

The intervention was delivered in two phases over four weeks to allow sufficient time for the participants to absorb and apply the information effectively. In the first week, both groups completed a pre-test. The intervention group received Modules 1 and 2, while the control group was given a standard Maternal and Child Health (MCH) manual. In the second week, a post-test was conducted for Modules 1 and 2 in the intervention group, followed by the administration of Modules 3 and 4. The control group also completed a post-test. In the third week, both groups completed an additional post-test to evaluate the remaining content. In the final week, a comprehensive post-test covering all the material was administered to both groups. Throughout the intervention period, participants were monitored and supported through a dedicated WhatsApp group to ensure engagement and understanding.

This study was approved by the Research Ethics Committee (Reference Number: 1207/UN4.14.1/TP.01.02/2023), and all participants provided informed consent prior to participation. Data were analyzed using the Wilcoxon Signed-Ranks Test and the Mann-Whitney U Test through SPSS version 25.

RESULTS

The process of developing an educational model is a modification of the 2020 MCH book of the Ministry of Health of the Republic of Indonesia. The MCH book with exclusive breastfeeding material was developed into a module with more specific material discussing exclusive breastfeeding with several improvements. In making this module, researchers involved several media experts and material experts, health center parties consisting of doctors, nutrition officers, health promotion teams, coordinator midwives, and several husbands of pregnant women. This module was developed using the development (R&D) method of Borg and Gall, which has been simplified by the Pultijaknov team, which consists of product analysis, initial product development, media expert and material expert trials, small sample trials, and large sample trials. The assessment and decision-making criteria for the exclusive breastfeeding module for husbands are as follows: (1) a value of 3.26-4.00 is very good; (2) a value of 2.51 - 3.25 is good; (3) a value of 1.76-2.50 is sufficient; (4) a value of 1.00-1.75 is less good. The very good and good criteria indicate that the module is feasible to use without revision, while the sufficient and less good criteria indicate that the module is not feasible and needs revision.

a. Media expert trials

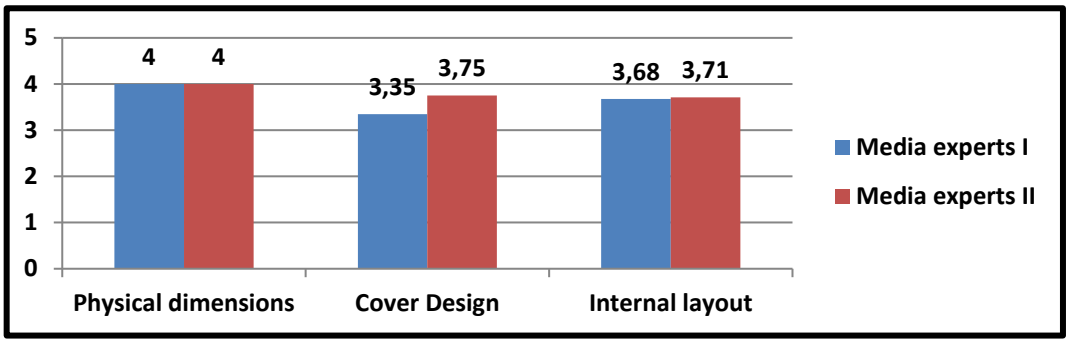


Figure 1: Chart of The Results of The Evaluation of Media Experts in The Exclusive Breastfeeding Education Module

Figure 1 illustrates the results of product validation conducted by two media experts from Hasanuddin University, Makassar. The average evaluation score was 3.73, indicating that the module demonstrated excellent quality in terms of media characteristics, such as physical dimensions, cover design, and internal layout. These findings support the feasibility of using the module as an effective educational tool to promote exclusive breastfeeding among husbands.

b. Expert trial

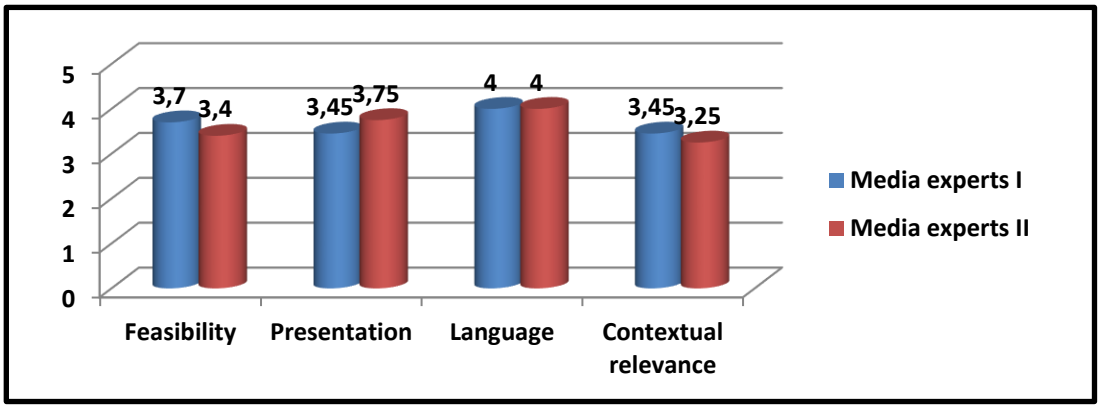
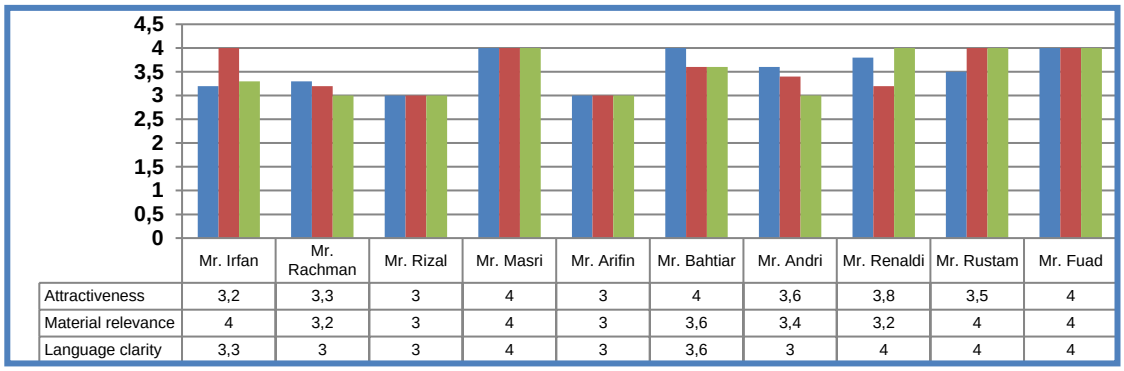


Figure 2 : Chart of The Results of The Evaluation of Material Experts in the Exclusive Breastfeeding Education Module

Figure 2 presents the assessment outcomes from two material experts who evaluated several aspects including content feasibility, presentation, language, and contextual relevance. All evaluated components received scores above 3.62, categorizing them as 'very good.' This suggests that the module is highly appropriate in terms of content accuracy and instructional quality.

c. Small sample trials



	Mr. Irfan	Mr. Rachman	Mr. Rizal	Mr. Masri	Mr. Arifin	Mr. Bahtiar	Mr. Andri	Mr. Renaldi	Mr. Rustam	Mr. Fuad
Attractiveness	3,2	3,3	3	4	3	4	3,6	3,8	3,5	4
Material relevance	4	3,2	3	4	3	3,6	3,4	3,2	4	4
Language clarity	3,3	3	3	4	3	3,6	3	4	4	4

Figure 3: Results of The Small Sample Trial Assessment Test of The Exclusive Breastfeeding Education Module

Figure 3 shows the results from the small-scale trial, where participants rated various components such as attractiveness, material relevance, and language clarity. Each component received an average score above 3.25, which falls within the 'very good' category. This implies that the module is well-received by users and is effective in improving knowledge about exclusive breastfeeding.

1. Univariate analysis was carried out to determine the characteristics of each variable studied

Table 1: Distribution of Frequency of Respondents of The Exclusive Breastfeeding Module Intervention Group and The MCH Book Control Group

Characteristic Demographics	Sample group				Total	
	Intervention		Control		n	%
	n	%	n	%		
Age						
19-22	1	3.3	1	3.3	2	3.3
23-26	6	20.0	8	26.7	14	23.3
27-30	7	23.3	7	23.3	14	23.3
31-34	8	26.7	5	16.7	13	21.8
35-38	5	16.7	3	10.0	8	13.3
> 38	3	10.0	6	20.0	9	15.0
Education						
Primary school	2	6.7	9	30	11	18.3
Junior High School	5	16.7	0	0.0	5	8.3
High School	22	73.3	17	56.7	39	65.0
Bachelor	1	3.3	3	10.0	4	6.7
Magister	0	0.0	1	3.3	1	1.7
Job						
Freelance	11	36.7	20	66.7	31	51.6
Private employees	18	60.0	7	23.3	25	41.7
Civil Servants	1	3.3	3	10.0	4	6.7
Gestational age						
7 months	11	36.7	18	60.0	29	48.3
8 months	6	20.0	7	23.3	13	21.7
9 months	13	43.3	5	16.7	18	30.0

Influence of others						
None	11	36.7	10	33.4	21	35.0
Family	3	10.0	4	13.3	7	11.7
Health Workers	14	46.7	15	50.0	29	48.3
Friend	1	3.3	1	3.3	2	3.3
Media	1	3.3	0	0.0	1	1.7
Information exposure						
Never	28	93.3	26	86.7	54	90.0
Social Media	2	6.7	4	13.3	6	10.0

***Frequency Distribution**

Based on the table above, the characteristics of respondents in the intervention and control groups based on age were dominated by husbands aged between 31 and 34, who dominated 8 people (26.7%), and in the control group, those aged 23-26 dominated 8 people (26.7%). Furthermore, education in the intervention group was dominated by 22 husbands with the last high school education (73.3%), and in the control group, it was dominated by husbands with the last high school education, as many as 17 people (23.3%). In the intervention group work, the husbands who work as private employees are dominated by 18 people (60.0%), and in the control group, the husbands who work as daily laborers are dominated by 20 people (66.7%). This shows that most respondents whose domicile area is in the factory area of the Kima area are those who work as factory employees and store employees in the surrounding area. Meanwhile, the control group showed densely populated areas where most of the daily work is construction day labor. In the influence group of other people, in the intervention group, dominated by husbands, received information about exclusive breastfeeding from health workers, as many as 14 people (46.7%), and in the control group, the same dominated by husbands, received information from health workers, as many as 15 people (50.0%), and the rest never received information about exclusive breastfeeding, as many as 28 people (93.3%), and in the control group, as many as 26 people (86.7%).

Table 2 Pretest Knowledge Before Being Given Modules in the Intervention Group and MCH Books in the Control Group

Knowledge pretest	Intervention		Control		n	%
	n	%	n	%		
Good	5	16.7	0	0.0	5	8.4
Enough	20	66.6	27	90.0	47	78.3
Less	5	16.7	3	10.0	8	13.3
Total	30	100.0	30	100.0	60	100.0

*Frequency distribution

Table 2 shows that the pre-test in the intervention group gained more category knowledge of 66.6% and in the control group more those who obtained 90.0% of category knowledge

Table 3 Post test 1 on materials 1 and 2 in the intervention group of the Exclusive Breastfeeding Module and the control MCH Book

Knowledge	Intervention		Control		n	%
Post test 1	n	%	n	%		
Good	18	60.0	6	20.0	24	40.0
Enough	12	40.0	21	70.0	33	55.0
Less	0	0.0	3	10.0	3	5
Total	30	100.0	30	100.0	60	100.0

**Frequency distribution*

Table 3 shows that post test 1 in material 1 & 2 in the intervention group gained more good category knowledge by 60.0% and in post test 1 the control group gained more good category knowledge by 70.0%.

Table 4 Post Test 2 on Materials 3 and 4 between the Exclusive Breastfeeding Module Intervention Group and the 2023 Control Group KIA Book

Knowledge	Intervention		Control		n	%
Post test 2	n	%	n	%		
Good	4	13.3	0	0.0	4	6.6
Enough	17	56.7	15	50.0	32	53.4
Less	9	30.0	15	50.0	24	40
Total	30	100.0	30	100.0	60	100.0

**Frequency distribution*

Table 4 shows that post test 2 materials 3 & 4 in the intervention group gained more category knowledge of 58.7% and post test 2 in the control group gained more category knowledge of 50.0%

Table 5 Post Test 3 Overall Material Between the Exclusive Breastfeeding Module Intervention Group and the 2023 Control Group MCH Book

Knowledge	Intervention		Control		n	%
Post test 3	n	%	n	%		
Good	25	83.3	2	6.7	27	45
Enough	5	16.7	24	80.0	29	48.4
Less	0	0.0	4	13.3	4	6.6
Total	30	100.0	30	100.0	60	100.0

**Frequency distribution*

Table 5 shows that post test 3 in the intervention group gained more good category knowledge 83.3% and post test 3 in the control group got more good category knowledge 80.0%

2. Bivariate analysis was carried out to determine the difference in knowledge about exclusive breastfeeding before and after being given the exclusive breastfeeding module.

Table 6: Analysis of Differences in Husbands' Knowledge Before and After Module Interventions at the Kapasa Makassar Health Center

Husband's knowledge	n	%	Negative ranks	Positive ranks	Ties	P value
Pre test- post test 1	30	100	7	23	0	0,000
Pre test- post test 2	30	100	7	23	0	0,002
Pre test-post test 3	30	100	2	28	0	0,000

** Wilcoxon rank test*

Table 6 shows that the knowledge of the intervention group respondents with an increase in post test scores of 1 negative 7 respondents and positive scores of 23 respondents with P values of 0.000 < 0.05 has a significant effect on the provision of material modules 1 and 2 on the knowledge of husbands. Post test 2 negative scores of 7 respondents and positive scores of 23 respondents with p values of 0.002 < 0.05 there is a significant influence of material modules 3 and 4 on the husband's knowledge and post test 3 negative scores of respondents 2 and positive scores of 28 respondents with p values of 0.000 < 0.05 there is a significant influence between the provision of modules and the knowledge of the husband.

Table 7: Analysis of Differences in Husband's Knowledge Before and After the MCH Book Intervention at the Pampang Makassar Health Center

Husband's knowledge	n	%	Negative ranks	Positive ranks	Ties	Nilai P
Pre test- post test 1	30	100	9	21	0	0,046
Pre test- post test 2	30	100	21	9	0	0,002
Pre test-post test 3	30	100	11	12	7	0,391

** Wilcoxon rank test*

Table 7 shows that the knowledge of the respondents in the control group with an increase in post test scores of 1 negative 9 and positive values of 21 with p values of 0.046 < 0.05 has a significant influence of giving MCH books on husbands' knowledge, post test 2 negative values of 21 and positive 9 values with p values of 0.002 < 0.05 there is a significant influence between KIA books and husband's knowledge. Post test 3 negative values of 11 and positive values of 12 with p values of 0.391 > 0.05 there was no significant effect between the provision of KIA books and the knowledge of the husband. Although the p-value in post test 1 and 2 was smaller than α = 0.05 which can be interpreted that there was a significant difference, but in post test 3 the p-value value was greater than α = 0.05 so it can be concluded that there was no difference in husband's knowledge about exclusive breastfeeding before and after being given the KIA book in the control group.

Table 8. Analysis of Differences in Pre-Test Knowledge in the Intervention and Control Groups at the Kapasa and Pampang Health Centers

	Group	n	%	Mean ranks	P value
Pretest	Intervention	30	100	32.67	0,317
	Control	30	100	28.33	

**Mann Whitney test*

Table 8 shows that the mean ranks of knowledge at the time of pre-test are higher in the intervention group of 32.67 than in the control group of 28.33. The results of the Mann–Whitney test showed that the comparison of knowledge between the intervention group and the control group before the intervention was *obtained p* = 0.317 (*p* > 0.05), which means that there was no significant difference between the intervention group and the control group.

Table 9 Analysis of Differences in Post Test 1 Knowledge in the Intervention and Control Groups at the Kapasa Health Center and Pampang Health Center

	Group	n	%	Mean ranks	P value
Post test 1	Intervention	30	100	37.35	0,001
	Control	30	100	23.65	

**Mann Whitney test*

Table 9 shows that the mean ranks of knowledge at the time of post tets 1 are higher in the intervention group of 37.35 than in the control group of 23.65. The results of the Mann–Whitney test showed that the comparison of knowledge between the intervention group and the control group after the first intervention was obtained $p = 0.001$ ($p < 0.05$), which means that there was a significant difference between the intervention group and the control group.

Table 10 Analysis of Differences in Post Test 2 Knowledge in the Intervention and Control Groups at the Kapasa Health Center and Pampang Health Center in Makassar

	Group	n	%	Mean ranks	P value
Post test 2	Intervention	30	100	41.15	0,000
	Control	30	100	19.85	

**Mann Whitney test*

Table 10 shows that the mean ranks of knowledge at the time of post test 2 were higher in the intervention group of 41.15 compared to 19.85 in the control group. The results of the Mann–Whitney test showed that the comparison of knowledge between the intervention group and the control group after the second intervention was obtained $p = 0.000$ ($p < 0.05$), which means that there was a significant difference between the intervention group and the control group.

Table 11 Analysis of Differences in Post Test 3 Knowledge in the Intervention and Control Groups at the Kapasa Health Center and Pampang Makassar Health Center in 2023

	Group	n	%	Mean ranks	P value
Post test 3	Intervention	30	100	43.78	0,000
	Control	30	100	17.22	

**Mann Whitney test*

Table 11 shows that the average score (mean ranks) of knowledge at the time of post test 3 of the whole material is higher in the intervention group of 43.78 compared to the control group of 17.22. The results of the Mann–Whitney test showed that the comparison of knowledge between the intervention group and the control group after the third intervention was obtained $p = 0.000$ ($p < 0.05$), which means that there was a significant difference between the intervention group and the control group.

DISCUSSION

Modules are teaching materials that are systematically arranged to be used as learning aids to achieve learning goals. Modules can be with minimal support or guidance from a supervisor, so that

recipients can learn on their own (independently). [23, 26, 27] The results of the comparative analysis of knowledge before and after the intervention with the Wilcoxon signed ranks test showed that there were significant differences in both the intervention group and the control group. For a comparative analysis of knowledge between the intervention group and the control using the Mann-Whitney test, significant results were obtained. By paying attention to these two results, it can be concluded that the development of an educational model in the form of a module has a positive effect on increasing the knowledge of pregnant husbands about exclusive breastfeeding. This research is in line with what was carried out [28] Regarding the development of a stunting risk detection module on the knowledge of pregnant women. The results of the study showed that most respondents, namely 82.5%, experienced an increase in knowledge, this stated that the module developed could increase the knowledge of pregnant women. These are the results of the research [29] showed that the validation of the bleeding risk detection module in pregnancy was considered very good and the average pre-test knowledge score of 60% increased to 85% after being given the bleeding risk detection module in pregnancy with the results of the Wilcoxon p-value 0.000 < 0.05 test.

This proves that the module developed is effective in increasing the knowledge of pregnant women to detect the risk of anemia in pregnancy against increasing the knowledge of pregnant women [30] while the results of the Wilcoxon signed ranks test found that there was no significant relationship between the provision of modules and the MCH book in line with the research [31] module 6 Patient Safety Goals Effective in Increasing Knowledge and Action or Implementation of Patient Safety Goals with *P Value* = < 0.05. Supported by Research [32] there was a positive association of the administration of the VTAM module on the knowledge and practice of nursing staff about infections acquired in hospitals in neonatal units. Meanwhile, in the difference in knowledge of the intervention group of the module and the MCH book in line with the study, there was a difference in knowledge between the intervention group of the module and the control group of the waiting list with p value = 0.01 < 0.05 [33]. Supported by research [34] that there was a significant difference between the antenatal care module intervention group and the control group doing counseling with p value = 0.001 < 0.05. Similarly, there was a significant difference between the knowledge of the intervention and control groups with p value = 0.01 <0.05 in working women at Universiti Putra Malaysia who were diagnosed with PCOS. [35]

The development of an educational model in the form of a module is carried out with the addition of more specific material about exclusive breastfeeding material such as the definition of exclusive breastfeeding, types of breast milk, benefits of breastfeeding, the composition of breast milk, breastfeeding problems, the dangers of formula feeding, breast milk production, how to express and store breast milk and prepare pregnant women for breastfeeding. The modified printed module can help pregnant women's husbands to easily understand the importance of exclusive breastfeeding to babies. In addition to complete material, the target can also adjust and learn independently and practically because it reduces the need to take notes, can easily see the content because it is accompanied by picture

explanations, and various information can be read by members of the target group to discuss together. Finally, it can provide detailed information that is not provided verbally.

CONCLUSIONS AND SUGGESTIONS

The exclusive breastfeeding education module increases husband's knowledge about the importance of breastfeeding, especially exclusive breastfeeding, so that it can be used as a health promotion medium in health care fasilities.

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