

# WhatsApp-based complementary feeding education and counselling for adolescent mothers: A one-group pre-post study

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**ABSTRACT** More than two-thirds of death in children are related to improper feeding practices. Especially in adolescent mothers, with very low levels of complementary feeding knowledge, less responsive, and skills of feeding practice. The area of Banguntapan III Public Health Center (PHC) has the highest prevalence of adolescent mothers in 2018-2019. The objective of this study is to evaluate the effect of WhatsApp-based complementary feeding education and counselling for adolescent mothers who have children aged 6-24 months at Banguntapan III PHC on complementary feeding knowledge and practice. A quasi-experimental with one group pre-post test was conducted (n=10 adolescent mothers) on February-May 2021 at the Banguntapan III PHC area. The education program is carried out by trained cadres for 8 days through the WhatsApp group, then followed by asynchronous counselling once through WhatsApp private chat. Change of outcome was tested using an independent sample T-test and Mc-Nemar test. The range of adolescent mothers' age in this study was 19-20 years, with education levels being Junior High School (50%), and unemployment (80%). The results showed that WhatsApp-based education and counselling had a significant effect on increasing the adolescent mother's IYCF knowledge ( $\Delta = 1.1 \pm 2.28$ ) with a p-value of  $0.017 < \alpha (0.05)$ . While the effect of the intervention on the IYCF practice by adolescent mothers was not significant, with a p-value of  $0.311 > \alpha (0.05)$ . In conclusion, WhatsApp-based education and counselling for adolescent mothers can increase their level of complementary feeding knowledge, but it has not been able to improve their feeding practice for infants/children aged 6-24 months.

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## 1. Introduction

Malnutrition plays a role in 60% of the 10.9 million deaths of children under the age of five each year, either directly or indirectly. This is because more than two-thirds of deaths in children are related to inappropriate feeding practices and often occur in the first year of life.<sup>1</sup> This underlies the preparation of the Infant and Young Child Feeding (IYCF) global strategy for infants/children aged 0-24 months, although its implementation in Indonesia has not been optimal.

Both internal and external factors affect the optimization of the implementation of a country's

IYCF program. Poverty conditions, seasonal food insecurity, and high workloads are inhibiting factors for optimal practice in the community.<sup>2,3</sup> Meanwhile, from the aspect of the program organizer system, the obstacles from cadres as providers in transferring information to clients in the counselling scheme, the program has not become a priority activity, and the absence of follow-up in the form of monitoring and evaluation at the Public Health Center (PHC) level is also a separate obstacle.<sup>4-6</sup>

In addition, the sub-optimization of the IYCF program can also be influenced by the high number of teenage pregnancy cases in an area. This is due to the very low proficiency of young women and mothers aged 15-23 years regarding IYCF.<sup>7</sup> The mothers aged <17 years tend to stop the practice of exclusive

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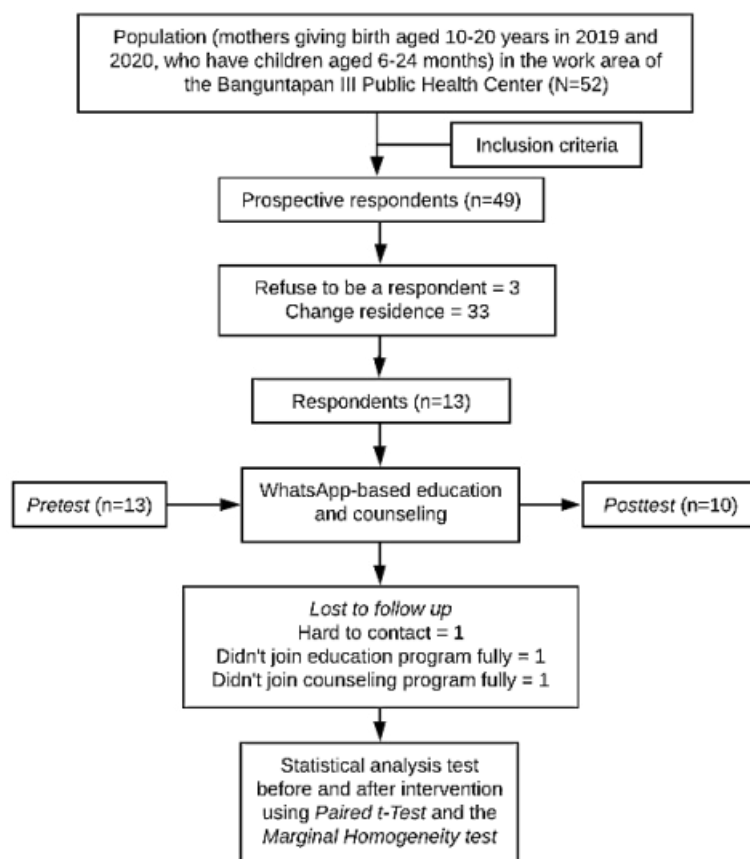


Figure 1. The research flow

breastfeeding too early are less responsive and are less skilled in implementing IYCF practices.<sup>8-10</sup> Based on the DIY Family Health data report (2019), Bantul district has the highest adolescent delivery data compared to other districts in the DIY province, and Banguntapan III Health Center is the health centre with the highest adolescent delivery data in Bantul district.

To increase the knowledge of the mother and infant, the complementary feeding education class has an effective influence.<sup>11</sup> However, the implementation of conventional education classes is not as flexible as before in the pandemic era. This condition makes it challenging as well as an opportunity to utilize technology as a medium for providing services with an online scheme. Therefore, this research is needed to stretch the type of online service by looking at the effect of WhatsApp-based complementary feeding education and counselling for adolescent mothers who have children aged 6-24 months at Banguntapan III PHC on complementary

feeding knowledge and practice.

## 2. Methods

The type of research is quasi-experimental research design with one group pre-post test design. This research was carried out in February-May 2021 in the work area of the Banguntapan III PHC, Banguntapan, Bantul. The minimum sample size calculation considers the average value of knowledge change ( $\delta$ ) and the standard deviation of the change ( $\sigma$  difference) based on the previous study.<sup>12</sup> The minimum sample size is calculated using the formula for paired data and already considered the possibility of respondents resign or lose to follow-up. The study sample size is 18 respondents.<sup>13</sup> The sampling method used was non-probability consecutive sampling. The inclusion criteria in this study were mothers aged 10-20 years who have children aged 6-24 months and don't have chronic health problems. As for exclusion criteria, respondents doesn't live in Banguntapan III PHC during the research.

**Table 1.** Respondent characteristics.

No	Characteristics	Category	n	Value (mean±SD)/ Percentage (%)
1	Mothers' age		10	19.5 ± 0.52
2	Children's age		10	15.3 ± 5.29
3	Mother's education	Elementary school	1	10
		Junior high school	5	50
		Senior high school	4	40
4	Mother's work status	Work	2	20
		Doesn't work	8	80
5	Childs' gender	Boys	5	50
		Girls	5	50
6	Low birth weight status	Yes	1	10
		No	9	90

**Table 2.** The mean of IYCF knowledge.

Items	Measure	Mean ± SD	p*
IYCF knowledge	Post	8,4 ± 1,4	0,017 <sup>a</sup>
	Pre	7,3 ± 1,8	

The data collected included data on subject characteristics, knowledge, and feeding practices obtained through structured interviews using a questionnaire. Knowledge variable data was measured using a knowledge questionnaire on complementary feeding that had been tested for validity and reliability. It consists of 11 questions for adolescent mothers and the results will be expressed in the form of a knowledge level scale is 0-11.<sup>14</sup> And feeding practice data was measured using a feeding practice questionnaire adopted from the IYCF module of the Ministry of Health in 2014.

Based on previous research that used the same questionnaire to collect feeding practice data evaluated mother's feeding practices as follows: each respondent who applies each indicator according to the recommendations is given a score of "1" and "0" otherwise. The accumulated score indicates an assessment of the implementation of the IYCF practice for adolescent mothers who were measured before and after treatment, then categorized into "Good", "Enough", and "Poor". Good if the practice score  $\geq 80$ , enough if the score between 60-79,9, and poor if the score is  $< 60$ .<sup>15</sup>

The WhatsApp-based educational and

counselling intervention was carried out by trained cadres, referring to the educational standard operational procedure (SOP) compiled by researchers. Trained cadres are defined as cadres who have attended a series of IYCF counsellor training held by the Banguntapan III PHC and have attended training related to counselling techniques. Six trained cadres joined as providers in this study. The number of cadres who participated has been adjusted to the number of respondents who met the inclusion-exclusion criteria and were willing to take part in this study.

The WhatsApp-based educational intervention was carried out for eight days with a structured material delivery mechanism. Based on previous research, specific short-term interventions such as education or WhatsApp lectures within 1 week can improve knowledge and understanding of mothers regarding stunting.<sup>16</sup> The material topics provided consist of the principles of giving complementary foods, recognizing hunger-full signals, adding complementary foods for children aged 6-9, 9-12, and 12-24 months, and giving complementary foods when children have difficulty eating or are sick. All topics of the material provided are following

**Table 3.** Frequency distribution of feeding practice indicators for infants and children age 6-24 months before and after treatment.

No	Items	Category	Pre-Test		Post-test	
			n	%	n	%
1	Breastfeeding	Yes	7	70	7	70
		No	3	30	3	30
2	Breastfeeding frequencies	Appropriate	6	60	6	60
			4	40	4	40
3		Appropriate	5	50	5	50
			5	50	5	50
4	Food textures	Appropriate	8	80	7	70
			2	20	3	30
5	Food variety	Appropriate	9	90	10	100
			1	10	0	0
6	Staple foods	Yes	10	100	10	100
		No	0	0	0	0
7	Fruits and vegetables	Yes	8	80	7	70
		No	2	20	3	30
8	Beans and legumes	Yes	5	50	3	30
		No	5	50	7	70
9	Diary product, flesh foods, or egg	Yes	10	100	10	100
		No	0	0	0	0
10	Snacks	Yes	4	40	7	70
		No	6	60	3	30
11	Clean cutlery	Yes	10	100	10	100
		No	0	0	0	0
12	Mothers wash hands	Yes	10	100	10	100
		No	0	0	0	0
13	Childs washes hands	Yes	3	30	9	90
		No	7	70	1	10

**Table 4.** The proportion of iycf practice before and after treatment.

IYCF Practices (Pre-Test)	IYCF Practices (Post-Test)						Total	p-value
	Good		Enough		Poor			
	n	%	n	%	n	%		
Good	2	20	1	10	0	0	3	0.311 <sup>a</sup>
Enough	2	20	3	30	0	0	5	
Poor	0	0	2	20	0	0	2	
Total	4	40	6	60	0	0	10	

the points evaluated in the knowledge variable through the IYCF knowledge questionnaire for adolescent mother.<sup>14</sup> Then, it was followed by giving

asynchronously counselling in private chat once. Each trained cadre counselled 2-3 researchers. The counselling process is done following the procedure made by researchers. Trained cadres who have finished the counselling process should take screen capture to save the counsel history, and then forward it to the researchers. Respondent's presence in the counselling program was seen from the establishment of two-way communication between trained cadres and respondents. So respondents who didn't reply to the messages were considered to have dropped out of the study.

Respondents were measured knowledge and feeding practice before and after the intervention. The respondents' characteristics were analyzed using univariate analysis. The knowledge and practice data were tested for normality using the Saphiro-Wilk test. Then, bivariate analysis was performed using paired t-test and marginal homogeneity test. This research has received official permission from the Ethics Commission of FKMK UGM through an Ethical Clearance Letter on December 29th, 2020, number: KE/FK/1376/EC/2020.

### 3. Results

The study was conducted from February – to May 2021. The total respondents who participated in this study were 13 mothers aged 19-20 years who had children aged 6-24 months, from a minimum sample size of 18 people. The minimum sample size could not be met because most of the teenage mothers no longer live in the work area of the Banguntapan III Health Center. The flow of respondent recruitment is shown in Figure 1.

Before the intervention started, the researcher first conducted a material refresher for trained cadres regarding IYCF points for infants/children aged 6-24 months, which was delivered by the PHC midwife. The supporting material by the psychologist at Banguntapan II PHC is about psychological aspects of adolescent mothers, and counselling approach techniques for this group. The meeting was held on February 27th, 2021 at PAUD Amanah, Banguntapan, Bantul, by implementing the full health protocol. Six trained cadres were participating as providers in this study. All trained

cadres have attended structured IYCF training held by the PHC before.

The age characteristics (Table 1) of the research respondents are in the range of 19-20 years (100%), with an average age of 19 years, the last education level is junior high school (50%), most of the mothers do not work (80%), have children with an average age of 15 months, the composition of infants/boys and girls was balanced (50%), and most were born with normal weight (90%).

The results of the normality test of the data on the IYCF knowledge and practices variable using the Shapiro-Wilk test showed that the knowledge and practice of IYCF before and after treatment was normally distributed, with  $p > 0.05$ . Therefore, the knowledge variable was then analyzed for changes before and after treatment using paired t-test. The results of the paired t-test analysis showed that the provision of WhatsApp-based education and counselling could increase the knowledge of IYCF for adolescent mothers ( $p < 0.05$ ), as shown in table 2.

They frequently ask questions during the program about how to deal with children who have difficulty eating, how to improve children's texture, and how to overcome food allergies in children. Furthermore, the quality of infant and child feeding practices can be seen from 13 indicators, presented in table 3.

The details of each of the indicators mentioned above serve as a reference for scoring the IYCF practice variables for adolescent mothers. Furthermore, statistical analysis using the Marginal Homogeneity test was carried out to see the effect of the intervention on the IYCF practice variable. The analysis results of the influence of education and counselling on the practice of IYCF for adolescent mothers are presented in the following table:

Based on the table above, there is a change in the practice of IYCF for adolescent mothers after receiving education and counselling by trained cadres. It shows that after received education and counselling, no more adolescent mothers had poor IYCF practice. However, based on Marginal Homogeneity test analysis, the change in the condition of the IYCF practice for adolescent

mothers was not statistically significant ( $p > 0.05$ ). Information related to the details of IYCF practices improvement is available in the discussion.

#### 4. Discussion

The analysis result of the IYCF knowledge variable before and after treatment using a paired t-test showed that the provision of WhatsApp-based education and counselling significantly increased the knowledge of IYCF in adolescent mothers ( $p < 0.05$ ). These results are in line with previous research that the provision of education through WhatsApp increases mothers' knowledge of exclusive breastfeeding. The use of WhatsApp as an educational medium was also considered effective that sending messages can be done at one time and reaches a wide range of people.<sup>12,17</sup>

The selection of the best educational media can also affect the participants' acceptance. In this study, researchers packaged educational materials into an infographic to attract interest and make it easier for participants to understand the material, so as expected it can increase their understanding. Infographics are considered more instructive than delivering material through text. Infographics are also the most recommended visual education media for readers. Infographics could be the best media to increase the understanding of conceptual knowledge through an attractive package. The delivery of information through images, as the largest component in infographics, has more potential in increasing learning output. In this case, it could optimize the increase in cognitive aspects of participants.<sup>17-19</sup>

The effectiveness and flexibility of time is a form of excellence in providing education through WhatsApp. Providing education through WhatsApp groups with a duration of around 2 hours according to the scheduled time is considered potential to be applied by educators as an alternative to providing information and education services to the community. Apart from being an educational medium, WhatsApp groups can be a good place for discussion and sharing experiences interactively. Based on observations, this also happened when the education process was running, 92.3% of respondents were always present and read the

materials distributed by trained cadres. Even during the program, respondents did not hesitate to ask some questions or share experiences and problems faced while implementing IYCF.<sup>20,21</sup>

In addition, the double exposure given to respondents, namely nutritional counselling, can be a means of strengthening the respondents' understanding and knowledge about IYCF. Counselling on growth and complementary feeding can increase a mother's knowledge about giving complementary feeding to children aged 6-24 months. The type of counselling based on WhatsApp private messages makes it easier for respondents and trained cadres as IYCF counsellors to communicate intensively and personally. It was easier for the respondents to express the problems faced by each in the context of IYCF. The use of technology as a counselling medium has good potential in increasing users' access to nutritional counselling itself. Internet counselling has advantages in terms of availability, helping clients feel more secure and reducing vulnerability, which can help facilitate the relationship between clients and counsellors.<sup>22-24</sup>

Based on the analysis result in 13 indicators for assessing IYCF practice in adolescent mothers, it shows that there is an enhancement in the percentage of adolescent mothers who apply IYCF practices according to the recommendations on the indicators of variations in food ingredients groups, provision of an interlude on the daily menu, and the children's handwashing habit. Meanwhile, the decrease in percentage was seen in the indicators of the form of food and the provision of food groups of vegetables, fruit, and nuts. As for the other 7 indicators, there was no change in the percentage of adolescent mothers who applied according to the recommendations, before and after treatment.

There was no change in breastfeeding indicators and breastfeeding frequency because 30% of adolescent mothers had stopped breastfeeding long before participating in the study. Teenage mothers tend to stop the practice of exclusive breastfeeding too early. Thus, the provision of education and counselling cannot affect changes in the direction of conformity with the recommendations.<sup>9,10</sup>

In the indicator of feeding frequency, only 50% of

adolescent mothers applied IDD practices according to the recommendations, and this percentage did not change after treatment. This is because 3 out of 5 teenage mothers who do not apply the recommended frequency are teenage mothers who also stop breastfeeding too early, while the other 2 have difficulties related to their child's appetite. As for infants and children aged 6-23 months who are not getting breast milk, an additional 1-2 extra meals are needed, in addition to the recommended main meal frequency in a day according to their age. Meanwhile, the mother's inability to manage her child's appetite can be caused adolescent mothers to tend to be less responsive and skilled in implementing IYCF practices, namely capturing hunger-full signals in children.<sup>8,25</sup>

The decrease in the percentage of adolescent mothers who applied IYCF practices according to the recommendations on the food form indicator, occurred because the child's health condition before the post-test measurement had a fever accompanied by thrush. This condition causes the child to experience a decrease in appetite, and the mother anticipates it by reducing the form of food to make it easier for the child to eat. Another factor is giving MP-ASI (complementary feeding) too early. Although the researchers did not measure the age of the infant/child when they first got complementary feeding, based on the results of data mining, some children got a food texture above their age, because the complementary feeding process was carried out earlier, as a follow-up impact of stopping breastfeeding too early (before 6 months of age). The enhancement in the percentage of adolescent mothers in providing a variety of eating according to recommendations, as well as practising handwashing habits in their children, can occur as the result of the mother's efforts to apply the material provided through the intervention.

All of these indicators serve as a reference for assessing IYCF practices for adolescent mothers in general, which are then categorized into good, enough, and poor. Based on the results of the analysis of the Marginal Homogeneity test, it appears that education and counselling have no significant effect on improving the practice of IYCF for adolescent mothers ( $p > 0.05$ ). Providing short-

term education and counselling could be a factor of improvement seen only in the aspect of knowledge and did not give any impact on IYCF practices. Specific short-term interventions, such as education or WhatsApp lectures for one week, can improve mothers' knowledge and understanding of stunting, even though they did not follow up concerning changes in IYCF practices. An increase in maternal practice in implementing IYCF for children aged 6-24 months can occur after receiving a social media-based e-counselling intervention for a duration of 1 month. Providing nutrition counselling by cadres with a frequency of 2 times for two months increased the value of maternal IYCF practices in infants and children aged 6-24 months.<sup>15,16,26</sup>

The strength of this study is the use of WhatsApp as an alternative education and counselling medium to implement the program. We also involve trained cadres as the main provider in the community who have the authority to assist them. Unfortunately, the total number of respondents who participated in this study was 13 people, from a total sample size of at least 18 people. This is because most of the adolescent mothers recorded in the PHC database are immigrants and no longer domiciled in the work area of the Banguntapan III PHC. The sampling process was not done randomly, because the number of available teenage mothers was limited. This study did not involve the respondent's family members, who have a chance to help adolescent mothers in practising IYCF. This research can have implications for public health intervention as an innovation in providing distance education and counselling services. Thus, assistance to this age group in particular, as well as the provision of services in general, which feels limited due to the pandemic condition can be resolved.

## 5. Conclusions

WhatsApp-based education and counselling for adolescent mothers can increase their level of complementary feeding knowledge but has not been able to improve their feeding practice for infants/children aged 6-24 months. The Public Health Center can consider WhatsApp-based education and counselling programs as an alternative to providing information services and increasing knowledge from

trained cadres to the community. Further research is needed by considering a longer duration, larger sample size, and the use of a control group to see the effect of the intervention on outcomes stronger.

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## Conflict of interest

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