Jurnal Aisyah: Jurnal Ilmu Kesehatan

Volume 7, Issue 4, December 2022, p. 1165–1172
ISSN 2502-4825 (print), ISSN 2502-9495 (online)

The Use of WhatsApp Groups as A Means of Health Education for Young Women About the First Thousand Days of Life (1000 HPK)

Yuli Admasari[1*], Sri Restu Tempali[2], Mercy Joice Kaparang[3]

[1,3] Prodi S.Tr Kebidanan, Jurusan Kebidanan, Poltekkes Kemenkes Palu, Palu, Indonesia
[2] Prodi DIII Kebidanan, Jurusan Kebidanan, Poltekkes Kemenkes Palu, Palu, Indonesia

ARTICLE INFO

Article history:

Received 20 July 2022
Accepted 31 October 2022
Published 10 December 2022

Keyword:

WhatsApp groups
health education
1000 HPK

A B S T R A C T

The growth and development of children is the fundamental thing that determines the future of a nation. One of the problems facing developing countries is stunting. The impact of stunting can increase the incidence of pain and death, motor, and verbal disorders, the risk of developing generalized diseases, and decreased productivity and work capacity. Interventions are prepared early, especially for adolescents, namely providing education for the First 1000 Days of Life (HPK) to young women through digital education which is currently being promoted. The study aims to prove the effectiveness of using WhatsApp Groups as a health education medium in young women with about 1000 HPK. The research method is quasi-experimental with one group removing treatment design which will be carried out in April – June 2022. The number of samples of 100 students in grades 11 & 12 at SMAN in the Palu city area was taken with cluster-stratified sampling techniques. The data were analyzed with a univariate test and a bivariate test using the Wilcoxon test. The results of the analysis showed that there was an increase in the average value of knowledge before and after treatment was 45.63 with p = 0.000 and there was an increase in the average attitude value before and after treatment was 42.49 with p = 0.000. This shows that the use of WhatsApp Groups as a health education medium is effective in increasing the knowledge and attitudes of young women by about 1000 HPK. It is hoped that the use of WhatsApp Groups will be increasingly used in health education by about 1000 HPK.

Kata kunci:

whatsapp groups
pendidikan kesehatan
1000 HPK

**) corresponding author*

Yuli Admasari, M.Tr.Keb

Prodi S.Tr Kebidanan, Jurusan Kebidanan,
Poltekkes Kemenkes Palu
Jln. Thalua Konchi No. 19 Mamboro Kec.
Palu Utara, Kota Palu Sulawesi Tengah

Email: admasariyuli@gmail.com

DOI: 10.30604/jika.v7i4.1328

A B S T R A K

Pertumbuhan dan perkembangan anak adalah hal mendasar yang menentukan masa depan suatu bangsa. Salah satu masalah yang dihadapi negara berkembang adalah stunting. Dampak stunting dapat meningkatkan kejadian kesakitan dan kematian, gangguan motorik, verbal, resiko terkena penyakit digeneratif, menurunya produktivitas dan kapasitas kerja. Intervensi dipersiapkan secara dini terutama saat remaja yaitu memberikan pendidikan 1000 Hari Pertama Kehidupan (HPK) pada remaja putri melalui digital education yang saat ini sedang digalakan. Tujuan penelitian untuk membuktikan efektifitas pemanfaatan whatsapp groups sebagai media pendidikan kesehatan pada remaja putri tentang 1000 HPK. Metode penelitian adalah quasi eksperiment dengan one group remove treatment design yang dilaksanakan pada bulan April–Juni 2022. Jumlah sampel 100 siswi kelas 11 & 12 di SMAN wilayah kota Palu yang diambil dengan tehnik clusterstratified sampling. Data dianalisis dengan uji univariat dan uji bivariate menggunakan uji Wilcoxon. Hasil analisis menunjukan terdapat peningkatan rata-rata nilai pengetahuan sebelum dan sesudah perlakuan adalah 45,63 dengan p=0,000 serta terdapat peningkatan rata-rata nilai

sikap sebelum dan seduah perlakuan adalah 42,49 dengan p=0,000. Hal ini menunjukan bahwa pemanfaatan whatsapp groups sebagai media pendidikan kesehatan efektif untuk meningkatkan pengetahuan dan sikap remaja putri tentang 1000 HPK. Diharapkan penggunaan whatsapp group semakin gencar dimanfaatkan dalam pendidikan kesehatan tentang 1000 HPK.

INTRODUCTION

The growth and development of infants and children are fundamental that determine the future of a nation (Ramli et al., 2009). One of the problems facing developing countries is stunting. Stunting is a sign of chronic malnutrition in children that reflects a failure to receive adequate nutrition over a long period (Dake et al., 2019). According to WHO, the impact of stunting can increase the incidence of pain and death, motor, and verbal disorders, the risk of developing generalized diseases, and decreased productivity and work capacity (Kemenkes RI, 2018).

Based on IEG (2018) toddlers aged 0-59 months who are stunted reach 22.2% (150.8 million) worldwide. Indonesia ranks third among countries in Southeast Asia. The percentage of stunting in Indonesia starting in 2007, 2010, 2013, and 2018 was 36.8%, 34.6%, 37%, and 30.8%. Although it has decreased, this figure is still far from the standard set by WHO. In Central Sulawesi, the prevalence of stunting is still quite high, namely 32.2% (Sulteng, 2019; Kemenkes RI, 2018).

Stunting can occur because it is influenced by several factors, including family socioeconomic factors, parental education, anemia, infectious diseases such as diarrhea, and nutritional intake during the first 1000 days of life (HPK) (Ramli et al., 2009; Dake et al., 2019). Inappropriate exclusive breastfeeding practices, inappropriate breastfeeding complementary feeding, and low infant weight were all three associated with stunting in many studies (Kismul et al., 2017; Walters et al., 2019; Mukhopadhyay *et al.*, 2014; Akombi *et al.*, 2017; Windasari, Syam and Kamal, 2020).

At the Global level, efforts to overcome the problem of stunting are supported by the United Nations (UN) through the Scaling-up Nutrition Movement (SUN Movement) program which focuses on 1000 HPK (Bappenas RI, 2013; IEG, 2018; Rahayu et al., 2018). A large framework has been launched by the government to reduce stunting rates in Indonesia. The first is a specific nutritional intervention targeting adolescents, women of childbearing age, and pregnant women until delivery. The second is a sensitive nutrition intervention with the target of all levels of society (not specifically pregnant women) (Kementerian Kesehatan Republik Indonesia, 2018; Nisa, 2018).

Interventions are prepared early, especially during the adolescent period so that women of childbearing age who will prepare for pregnancy can give birth to their children properly (Kementerian PPN/ Bappenas, 2018). The existence of this early effort by providing education about 1000 HPK to young women of childbearing age is expected to be reproductively ready to become pregnant.

The use of digital-based media to increase public knowledge lately is being promoted (Permana & Izzati, 2020). One that can be used is Whatsapp social media because of the ease of its features and services (Wahyuni, 2021). Referring to the description above, the researcher is interested in researching the use of Whatsapp groups as a means of health education in young women about 1000 HPK. The purpose of the study is to prove the effectiveness of using WhatsApp groups as a health education medium in young women with about 1000 HPK.

METHOD

Research Design

This study was a quasi-experiment with one group remove treatment design. It was used to find out the effectiveness of WhatsApp groups as a health education medium in increasing knowledge and attitudes about 1000 HPK in young women. The variability of knowledge and attitudes was measured four times, namely, the pretest was carried out before treatment, the first posttest was carried out one day after the treatment, the second posttest was carried out two weeks after the treatment and the third posttest was carried out six weeks after the treatment. Pretest and posttest are carried out by distributing questionnaires directly to respondents. The treatment was given to respondents in the form of health education through Whatsapp groups for one week by sharing four materials, namely the first material in the form of stunting videos and 1000 HPK, the second material in the form of power points about the nutrition during pregnancy, the third material in the form of videos about the nutrition of babies aged 0-6 months and the fourth material in the form of power points about nutrition for babies aged 6-24 months. At the end of each material, a question and answer session was given to the respondents. The research was carried out at the SMAN in the Palu City area in April – June 2022 and has received ethical approval from the ethics committee of the Health Polytechnic of the Ministry of Health, Palu.

Sampling

The population in this study was all students in grades 11 and 12 in the high school area of Palu City. Based on the Lemeshow formula and cluster stratified sampling techniques, the total sample of 100 people was taken from five Palu City High Schools, namely SMAN 1 (East Palu), SMAN 3 (South Palu), SMAN 4 (West Palu), SMAN 6 (Tatanga) and SMAN 7 (Tawaeli). Each SMAN was taken by 20 respondents with details of 10 respondents of grade 11 and 10 respondents of class 12. The inclusion criteria are students in grades 11 and 12 who have a WhatsApp application and are willing to take part in research from beginning to end. Meanwhile, the exclusion criteria are female students who plan to change schools during the research period.

Measures

Data collection using a questionnaire consisted of 20 knowledge questions as well as 20 attitude statements. The questionnaire has been tested for validity with a test value of 0.76 and a reliability test result of 0.68. The range of questionnaire values is 0-100, the higher the value obtained by respondents, the better the knowledge and attitude about 1000 HPK.

Data analysis

This study uses univariate analysis to describe the characteristics of the respondents. Furthermore, the normality test of the research data was carried out using the Kolmogorov Smirnov test because the sample amounted to 100. Based on the results of the normality test, the p-value of the data was less than 0.05 so the data analysis used the Wilcoxon sign rank test to compare the pre-and post-averages in both knowledge and attitudes.

RESULTS AND DISCUSSION

Based on table 1, data shows that almost half of the respondents are 17 years old (44.0%). In terms of the father's occupation, almost half of them are other (45.0%), while the mother's work is mostly housewife (75.0%). Almost half of the father's education background graduated from high school (46.0%) and almost half of the mother's education also graduated from high school (49.0%). Most of the respondents had never received information about 1000 HPK (58.0%) and those who had received information about 1000 HPK were mostly from magazines/newspapers/internet (24.0%).

Based on whether or not they received information, most of the respondents had never received information about 1000 HPK (58%). So this will affect the level of knowledge of adolescents by about 1000 HPK. Based on the research by Mappamadeng et al (2021) that respondents who do not have enough information will have less knowledge. This result is in accordance with the opinion of Martorell (2017) in his research that it is necessary to increase the provision of information on 1000 HPK to prevent stunting.

Table 1
Frequency Distribution of Responden (n=100)

Characteristics	Frequency	Percentage
Age		
15	15	15,0
16	36	36,0
17	44	44,0
18	5	5,0
Paternal work		
PNS/TNI/POLRI	23	23.0
Private employees	2	2.0
Self-employed	30	30.0
Other	45	45.0
Mother's work		
PNS/TNI/POLRI	11	11.0
Private employees	1	1.0
Self-employed	13	13.0
Housewives	75	75.0
Paternal level of education		
No school	0	0.0
Elementary	10	10.0
Junior high school	16	16.0
Senior high school	46	46.0
College	28	28.0
Mother's level of education		
No school	0	0.0
Elementary	8	8.0
Junior high school	14	14.0
Senior high school	49	49.0
College	29	29.0
1000 HPK information		
Ever	42	42.0
Never	58	58.0
Sources of information		
Never	58	58.0
Health workers	13	13.0
Television/ radio	3	3.0
Magazine/newspaper/ internet	24	24.0
Family/ friend	2	2.0

Table 2
The results of the univariate analysis of the characteristics of the research variables

No	Variabel	Mean	SD	Min	Max
1	Pre-knowledge	75,95	13,93	30	95
2	Pre-attitude	67,70	70,00	35	100
3	Post knowledge 1 (1 day after treatment)	77,75	80,00	35	100
4	Post attitude 1 (1 day after treatment)	73,60	14,90	40	100
5	Post knowledge 2 (2 weeks after treatment)	76,25	14,60	25	100
6	Post attitude 2 (2 weeks after treatment)	72,85	14,62	40	100
7	Post knowledge 3 (6 weeks after treatment)	76,00	15,69	15	100
8	Post attitude 3 (6 weeks after treatment)	72,85	14,99	40	100

Based on table 2 above, there was an increase in the average knowledge before treatment (75.95) with post knowledge 1 (77.75). Likewise, the average knowledge has increased compared to pre-knowledge (75.95) with post-knowledge 2 (76.25) and post-knowledge 3 (72.85). Of the three knowledge posts, the highest average value was obtained in post knowledge 1. The results of the attitude variable analysis showed an increase in the average attitude before treatment (67.70) compared to post attitude 1 (73.60). Likewise, there was an increase in the average attitude post attitude 2 (72.85) and post attitude 3 (72.85) when compared to pre-attitude (67.70). The highest average attitude value was obtained at post attitude 1 (73.60).

Table 3
The results of the Wilcoxon test for the knowledge variable (N=100)

Knowledge Variable	Rank	N	Mean Rank	Asymp. Sig (2-tailed)
Pre – Post 1	Negative Ranks	23	47,09	0,030
	Positif Ranks	54	35,56	
	Ties	23		
Pre – Post 2	Negative Ranks	31	51,21	0,371
	Positif Ranks	53	37,41	
	Ties	16		
Pre – Post 3	Negative Ranks	32	51,14	0,761
	Positif Ranks	50	35,33	
	Ties	18		
Pre – Post average	Negative Ranks	7	31,43	0,000
	Positif Ranks	81	45,63	
	Ties	12		

Based on table 3 after the Wilcoxon test was carried out on the knowledge value of pre and post-1 knowledge, 23 respondents experienced a decrease in value, 54 respondents experienced an increase in value and 23 respondents had the same value between pre and post- 1 knowledge. The increase in the average value of knowledge is 35.56. The test results were p=0.030 (p<0.05) so there was an effect of health education through WhatsApp groups on increasing knowledge about 1000 HPK one day after treatment.

Table 3 above also shows that in the measurement of knowledge at 2 weeks and 6 weeks post-treatment there is no significant effect of health education through WhatsApp groups on knowledge about 1000 HPK. This conclusion was shown by the value of p=0.371 (p≥0.05) at 2 weeks post-treatment and p=0.761(p≥0.05) at 6 weeks post-treatment.

The results of the analysis shown in table 3 on the comparison of the pre-value and the average post-knowledge value showed that there were 7 respondents who experienced a decrease in value, 81 respondents experienced an increase and 12 respondents had the same value between pre and post. The test results p = 0.000 (p <0.05) so that there is an effect of health education through WhatsApp groups on increasing the knowledge of young women of about 1000 HPK in SMAN Palu City.

Table 4
Hasil uji wilcoxon varibel sikap

Knowledge Variable	Rank	N	Mean Rank	Asymp. Sig (2-tailed)
Pre – Post 1	Negative Ranks	12	34,79	0,000
	Positif Ranks	64	39,20	
	Ties	24		
Pre – Post 2	Negative Ranks	18	39,14	0,000
	Positif Ranks	58	38,30	
	Ties	24		
Pre – Post 3	Negative Ranks	17	47,24	0,000
	Positif Ranks	61	37,34	
	Ties	22		
Pre – Post average	Negative Ranks	7	30,93	0,000
	Positif Ranks	75	42,49	
	Ties	18		

Based on table 4 above the results obtained on the measurement of attitude 1-day post-treatment 12 respondents experienced a decrease in attitude values, 64 respondents experienced an increase in attitude values and as many as 24 respondents had fixed values before and after treatment. The average value of increasing knowledge is 39.20. The Wilcoxon test showed a value of p = 0.000 (p <0.05) meaning that health education through WhatsApp groups had an effect on increasing the attitude of young women about 1000 HPK post 1 day of treatment.

Table 4 also shows that in the attitude assessment pre and post-2 weeks of treatment, 18 respondents experienced a decrease in attitude, 58 respondents experienced an increase in attitude value and as many as 24 respondents had a fixed attitude value pre and post. The average increase in value is 38.30 points. The value of p = 0.000 (p <0.005) so that health education through WhatsApp groups affects increasing the attitude of young women about 1000 HPK post 2 weeks of treatment.

Assessment of pre and post-attitude values 6 weeks after treatment, based on table 4 shows 17 respondents experienced a decrease in attitude values, 61 respondents experienced an increase in attitude values and 22 respondents had fixed values. The average value of the increase in the attitude value is 37.34 points. The Wilcoxon test showed p = 0.000 (p <0.005) meaning that health education through WhatsApp groups affected increasing the attitudes of young women about 1000 HPK post 6 weeks of treatment.

The last assessment tries to compare the pre-values and the average post-attitude values which shows that 7 respondents experienced a decrease in attitude values, as

many as 75 respondents experienced an increase and 18 respondents had a fixed value. The average value increase is 42.94 points. The results of the Wilcoxon test showed p = 0.000 (p <0.005), meaning that health education through WhatsApp groups affected increasing the attitudes of young women about 1000 HPK in SMAN Palu City.

DISCUSSION

The effect of health education through WhatsApp groups on the knowledge of young women is about 1000 HPK.

The facts obtained based on table 3 illustrate that health education through whatsapp groups has an effect on increasing the knowledge of young women about 1000 HPK on 1 day after treatment. While for 2 weeks and 6 weeks after treatment was not significant. Although the results of the pre-post 2 and pre-post 3 measurements were not significant, at the end of the session the researchers tried to do a pre and post analysis of the average knowledge in all sessions showing that there was an effect of health education through WhatsApp groups on increasing the knowledge of young women about 1000 HPK at SMAN Palu City.

The researcher assumes that the more often information is given to the respondent, the longer the knowledge held by the respondent will be. In this study, the treatment was given once so that it affected the length of time the knowledge of 1000 HPK respondents lasted. By the theory conveyed by Notoadmojo in Bertalina & Rahmadi (2021) that the provision of information repeatedly will be related to resilience and increase one's knowledge. In addition, there are many factors that can affect knowledge, namely experience, sources of information, interests and age.

Respondents in this study were young women aged 15-18 years. Prevention of stunting through health education of about 1000 HPK needs to be promoted continuously. Adolescent girls play a key role in maintaining health during pregnancy, childbirth, postpartum until the age of 2 years for the children they give birth to (Sunaeni et al., 2022). The next generation who are responsible for giving birth to a new generation is young women. As a prospective mother, it is necessary to provide insight on how to maintain health during the 1000 HPK period in supporting the reduction of stunting in Indonesia(Rahmiati et al., 2019).

This study proves that nutrition education through WhatsApp groups increases the knowledge of young women about 1000 HPK. According to Burner in Koka (2014) This increase in knowledge is caused by new information submitted to respondents where the new information obtained is a substitute for the knowledge that has been previously obtained or is a refinement of previous information. In addition, the development of increasingly advanced print and electronic media makes it easier for teenagers to access information about 1000 HPK (Susanti, 2021).

The use of WhatsApp groups is increasingly being used in health education when targets are not easily collected in one place. The use of WhatsApp groups can increase knowledge and there have also been many studies that conclude the same thing. Research conducted Saraswati et al (2019) as well as Yusriani and Acob (2020) proves that WhatsApp is more effective for increasing knowledge compared to leaflet media in health education. WhatsApp media was chosen because it is a messaging application for smartphones that allows users to exchange messages and receive information through audio, visual, and audiovisual media. Messages or information written on WhatsApp will be stored and can be read repeatedly. In addition, messages can also be equipped with pictures and videos so that they are more attractive to respondents.

WhatsApp as one of the online media that has a positive effect on knowledge can be used as a medium for health promotion through writing, images, audio, and video. This significant influence cannot be separated from the supporting features that can be maximized to carry out health promotion activities related to 1000 HPK. The content that can be facilitated by WhatsApp groups has shown a positive response in the form of increasing respondents' knowledge. The results of this study are in line with research conducted by Usman et al (2019) that there was an increase in the average value of knowledge about the dangers of abortion by 6.59 in SMAN 3 Palu students after being given health education through WhatsApp groups.

The results of this study are in line with the opinion of Haenlein in Adriana & Herdhianta (2021) who revealed that social media is defined as online media where users can easily participate, share, and create works or content (content). It can be concluded that WhatsApp media has an effect on increasing the knowledge of young women by about 1000 HPK. This media has a positive impact if used properly, for example providing information, counseling, and learning.

Other research conducted by Risna & Isfaizah (2022) which compares the effectiveness of online and offline health education and shows that online media is more effective in increasing knowledge than offline methods. The use of digital media in health education needs to be increased. Health education using WhatsApp has many advantages, namely, it is not limited by space and time so you can access information at any time. Based on opinion Rathbone et al (2020) WhatsApp is widely used for social purposes, however, the messaging software has been associated with various health practices. Whatsapp can be used as a means to provide health education to the wider community.

The effect of health education through WhatsApp groups on young women's attitudes about 1000 HPK.

Based on table 4, it can be concluded that health education through WhatsApp groups is effective in increasing the attitudes of young women of about 1000 HPK at SMAN Palu City. The researcher argues that the increase in attitudes after being given health education through WhatsApp groups was accompanied by an increase in respondents' knowledge so that it had an impact on the positive attitudes possessed by young women of about 1000 HPK. This increase is in accordance with the theory presented by Saifuddin (2016) that the provision of health education can change a person's attitude. Health education through WhatsApp groups causes information absorbed by young women to change attitudes about 1000 HPK.

WhatsApp as one of the social media that can be used for health education is effective in improving young women's attitudes about 1000 HPK. Research that compares the effectiveness of WhatsApp and Instagram used for health promotion shows that WhatsApp is more effective than Instagram in improving respondents' attitudes (Sari, 2019).

The results of this study are in line with research conducted by Melati et al (2021) who used WhatsApp groups for health education for pregnant women about stunting

prevention, showed that whatApp groups as an effective educational tool to increase the knowledge and nutritional attitudes of pregnant women. Other research conducted by Manullang (2020) there is an increase in the average attitude of adolescent girls about anemia by 34.73 after receiving health education through the WhatsApp group.

Health education through WhatsApp Groups can improve the attitude of young women for the better. The results of other research conducted by Gafi et al (2019) concluded that the use of WhatsApp Groups affected increasing attitudes about smoking. Likewise, research conducted by Tepriandy (2021) mentioned that WhatsApp Groups media had a positive impact on students regarding balanced nutrition during the Covid-19 pandemic. From this description, it can be concluded that WhatsApp social media has a positive impact when used for health education and counseling media. Especially in the era of technology 4.0, the development of fast-paced and instant communication media requires the provision of alternative media for health education that is suitable for the situation of adolescents, one of which is by using WhatsApp Groups.

WhatsApp groups are a choice of digital media that can be applied for health promotion. The WhatsApp application has the characteristics of being low-cost, secure, and fast, giving rise to a positive perception of the usefulness of technology. Likewise with Nardo et al. (2016) said that WhatsApp is a low-cost, secure, fast technology that offers clinical and non-clinical communication opportunities, enhances learning, and improves patient care. Research results Khanna et al (2015) added that the use of WhatsApp tends to be easier and conversations with WhatsApp groups as an ideal tool for health education.

LIMITATION OF THE STUDY

This study did not control for other confounding factors that could affect the knowledge and attitudes of young women about 1000 HPK.

CONCLUSIONS AND SUGGESTIONS

Based on the results of the study, it was concluded that there were an increase in knowledge (p = 0.000) and attitudes (p = 0.000) of about 1000 HPK after health education was carried out through WhatsApp Groups for adolescents girls at SMAN Palu City. It is hoped that the provision of health education can utilize WhatsApp Groups media as one of the online media that has many advantages, namely easy to use, cheap, fast, and many supporting features so that it is more in line with the conditions of young women in the digital era like today. Health education is expected to be provided periodically so that the retention of more information will be longer.

Acknowledgment (If Necessary)

Technical assistance and advice can be described at the end of the text. Then the names of individuals that are included in this section, the author is responsible for the written consent of every person who communicates personally or recognized by the individual in the text.

ETHICAL CONSIDERATIONS

Funding Statement.

The research leading to these results received funding from DIPA Poltekkes Kemenkes Palu under Grant Agreement No LB.02.03/3.b/0024/I/2022.

Conflict of Interest Statement

This research is a beginner research scheme that has passed the research grant selection within the Health Polytechnic of the Ministry of Health of the Republic of Indonesia. The research was carried out for approximately one year starting from the preparation of the proposal, selection, implementation of research, and reporting. The research implementation has received an ethical pass letter from the Ethics Committee of the Health Poltekkes of the Palu Ministry of Health with the number 0038/KEPK-KPK/III/2022. The research output is published in JIKA in 2022.

REFERENCES

Adriana, N. P., & Herdhianta, D. (2021). International Journal of Multicultural and Multireligious Understanding. *International Journal of Multicultural and Multireligious Understanding*, *8*(7), 500–507. https://doi.org/10.18415/ijmmu.v8i7.2849

Akombi, B. J., Agho, K. E., Hall, J. J., Wali, N., Renzaho, A. M. N., & Merom, D. (2017). Stunting, wasting and underweight in Sub-Saharan Africa: A systematic review. *International Journal of Environmental Research and Public Health*, *14*(8), 1–18. https://doi.org/10.3390/ijerph14080863

Bappenas RI. (2013). *Pedoman Perencanaan Program Gerakan Nasional Percepatan Perbaikan Gizi Dalam Rangka Seribu Hari Pertama Kehidupan (Gerakan 1000 HPK)*. Jakarta : Bappenas RI

Bertalina, & Rahmadi, A. (2021). Counseling for pregnant women in the focus stunting village of Lampung Timur District. *Gizi Indonesia Journal of The Indonesian Nutrition Association*, *44*(1), 97–108. http://www.ejournal.persagi.org/index.php/Gizi_Indon/article/view/491/272

Dake, S. K., Solomon, F. B., Bobe, T. M., Tekle, H. A., & Tufa, E. G. (2019). Predictors of stunting among children 6-59 months of age in Sodo Zuria District, South Ethiopia: A community based cross-sectional study. *BMC Nutrition*, *5*(1), 1–7. https://doi.org/10.1186/s40795-019-0287-6

Gafi, A. Al, Hidayat, W., & Tarigan, F. L. (2019). Pengaruh Penggunaan Media sosial WhatsApp dan Booklet terhadap Pengetahuan dan Ssikap Siswa tentang Rokok di SMA Negeri 13 Medan. *Jurnal Muara Sains, Teknologi, Kedokteran Dan Ilmu Kesehatan*, *3*(2), 281–290. https://doi.org/http://dx.doi.org/10.24912/jmstkik.v3i2.5656

IEG. (2018). Global Nutrition Report - executive summary. *Global Nutrition Report*, *June*, 118. http://www.segeplan.gob.gt/2.0/index.php?option=com_content&view=article&id=472&Itemid=472

Kemenkes RI. (2018). Situasi Balita Pendek (stunting) di Indonesia. *Pusat Data Kemenkes RI*, *301*(5), 1163–1178. https://pusdatin.kemkes.go.id/folder/view/01/structure-publikasi-pusdatin-buletin.html

Kementerian Kesehatan Republik Indonesia. (2018). Warta Kesmas - Cegah Stunting Itu Penting. *Warta Kesmas*, *02*, 1–27. https://kesmas.kemkes.go.id/assets/upload/dir_519d41d8cd98f00/files/Warta-Kesmas-Edisi-02-2018_1136.pdf

Kementerian PPN/ Bappenas. (2018). Rencana Aksi Nasional dalam Rangka Penurunan Stunting: Rembuk Stunting. In *Rencana Aksi Nasional dalam Rangka Penurunan Stunting: Rembuk Stunting* . http://tnp2k.go.id/filemanager/files/Rakornis%202018/Pedoman%20Pelaksanaan%20Intervensi%20Penurunan%20Stunting%20Terintegrasi%20Di%20Kabupaten%20Kota.pdf

Khanna, V., Sambandam, S. N., Gul, A., & Mounasamy, V. (2015). "WhatsApp"ening in orthopedic care: a concise report from a 300-bedded tertiary care teaching center. *European Journal of Orthopaedic Surgery and Traumatology*, *25*(5), 821–826. https://doi.org/https://doi.org/10.1007/s00590-015-1600-y

Kismul, H., Acharya, P., Mapatano, M. A., & Hatløy, A. (2017). Determinants of childhood stunting in the Democratic Republic of Congo: Further analysis of Demographic and Health Survey 2013-14. *BMC Public Health*, *18*(1), 1–14. https://doi.org/10.1186/s12889-017-4621-0

Koka, E. M. (2014). *Pengaruh Pendidikan Gizi 1000 HPK terhadap Pengetahuan dan Sikap Siswa SMA Negeri 1 Secanggang Kecamatan Secanggang Kabupaten Lankat* [Universitas Sumatra Utara Medan]. https://repositori.usu.ac.id/handle/123456789/40740

Manullang, T. D. U. (2020). *Pengaruh Pendidikan Kesehatan dengan Media Grup Chat Whatsapp Cemia (Cegah Anemia) terhadap Pengetahuan dan Sikap Remaja Putri tentang aAnemia di SMA N 3 Kota Bengkulu* [Poltekkes Kemenkes Bengkulu]. http://repository.poltekkesbengkulu.ac.id/458/1/Softfile skripsi Tri dame uly manullang.pdf

Mappamadeng, A. A., Kurnaesih, E., & Fairus Prigatin Idris. (2021). Intervensi Edukasi Tentang Pengasuhan Anak pada 1000 Hari Pertama Kehidupan(HPK) Di Wilayah Puskesmas Takalalla Kabupaten Soppeng. *AnIdea Health Journal*, *1*(2), 24–65. http://ihj.ideajournal.id/index.php/IHJ/article/view/49/21

Martorell, R. (2017). Improved nutrition in the first 1000 days and adult human capital and health. *American Journal of Human Biology, 29(2):10.1002.* https://doi.org/https://doi.org/10.1002/ajhb.22952

Melati, I. P., Anna, C., & Afifah, N. (2021). Edukasi Gizi Pencegahan Stunting Berbasis Whatsapp Group Untuk Meningkatkan Pengetahuan Dan Sikap Ibu Hamil. *Pangan Kesehatan Dan Gizi*, *1*(2), 61–69. https://www.mendeley.com/catalogue/2df76a31-de08-3999-85db-788650b2d7fa/

Mukhopadhyay, K., Louis, D., Mahajan, G., & Mahajan, R. (2014). *Longitudinal Growth of Elbw Neonates*. www.who.int/nutgrowthdb/software/en.

Nardo, B., Cannistra, M., Diaco, V., Naso, A., Novello, M., Zullo, A., Ruggiero, M., Grande, R., & Sacco, Rosario. (2016). Optimizing Patient Surgical Management Using WhatsApp Application in the Italian Healthcare System. *Telemed J E Health*, *22*(9), 718–725. https://doi.org/10.1089/tmj.2015.0219

Nisa, L. S. (2018). Kebijakan Penanggulangan Stunting Di Indonesia Stunting Prevention Policies in Indonesia. *Jurnal Kebijakan Pembangunan*, *13*(2), 173–179. http://jkpjournal.com/index.php/menu/article/view/78

Permana, I., & Izzati, U. (2020). Inovasi Pelayanan Kesehatan Publik Berbasis e-Government (Studi Kasus: Inovasi Ayo Ceting di Puskesmas Andalas). *JESS (Journal of Education on Social Science)*, *4*(1), 25. https://doi.org/10.24036/jess.v4i1.255

Rahayu, A., Rahman, F., & Marlinae, L. (2018). *Buku Ajar 1000 HPK*.

Rahmiati, B. F., Naktiany, W. C., & Ardian, J. (2019). Effectiveness of Nutritional Education Intervention in Iron Suplementation Programs on Knowledge, Attitude and Behavior. *Ghidza: Jurnal Gizi Dan Kesehatan*, *3*(2), 47–51. https://doi.org/10.22487/j26227622.2019.v3.i2.14020

Ramli, Agho, K. E., Inder, K. J., Bowe, S. J., Jacobs, J., & Dibley, M. J. (2009). Prevalence and risk factors for stunting and severe stunting among under-fives in North Maluku province of Indonesia. *BMC Pediatrics*, *9*, 64. https://doi.org/10.1186/1471-2431-9-64

Rathbone, A. P., Norris, R., Parker, P., Lindley, A., Robinson, A., Baqir, W., Campbell, D., & Husband, A. (2020). Exploring the use of WhatsApp in out-of-hours pharmacy services: A multi-site qualitative study. *National Center for Biotechnology Information*, *16*(4), 503–510. https://doi.org/10.1016/j.sapharm.2019.06.019.

Risna, N., & Isfaizah, I. (2022). The Effectiveness of Health Education Online Methods and Offline Methods About MP-ASI for Mothers Who Have Infants Age 6-24 Months in Gunung Raja Village. *Journal of Holistics and Health Sciences (JHHS)*, *4*(1). https://doi.org/https://doi.org/10.35473/jhhs.v4i1.129

Saifuddin, A. (2016). *Sikap Manusia Teori dan Pengukurannya*. Pustaka Pelajar.

Saraswati, S., Tasnim, T., & Sunarsih, S. (2019). Pengaruh Media Whatsapp Dan leaflet Terhadap Pendidikan Kesehatan Pada Siswi Sekolah Menengah Atas Di Kota Kendari. *Al-Sihah: Public Health Science Journal*, *11*(2), 107–117. https://www.mendeley.com/catalogue/4aeb4d4b-9132-3e73-a6a8-d0c5931a175d

Sari, A. F. (2019). The Effectiveness of Whatsapp and Instagram as Breast Self Examination (BSE) Health Promotion Media to Prevent Breast Cancer. *The Innternational Coference on Asean*, 258–265. https://doi.org/https://doi.org/10.1515/9783110678666-034

Sulteng, D. (2019). Profil Kesehatan Sulawesi Tengah tahun 2019. In *Dinas Kesehatan Sulawesi Tengah*. https://dinkes.sultengprov.go.id/wp-content/uploads/2018/06/profil-Dinkes-Sulteng-TA.-2019.pdf

Sunaeni, Abduh, A. I. M., & Isir, M. (2022). Efektivitas Media Audio Visual dalam Meningkatkan Pengetahuan Tentang Seribu Hari Pertama Kehidupan Remaja Putri. *Malahayati Nursing Journal*, *4*(3), 591–600. https://doi.org/DOI:https://doi.org/10.33024/mnj.v4i3.5971

Susanti, L. (2021). Pengaruh Pendidikan Kesehatan Dengan Booklet terhadap Pengetahuan Ibu Hamil Tentang 1000 Hari Pertama Kehidupan. *Jurnal Delima Harapan*, *8*(2), 46–52. https://doi.org/https://doi.org/10.31935/delima.v8i2.136

Tepriandy, S. (2021). *Pengaruh Media Edukasi Kesehatan Berbasis Daring Terhadap Pengetahuan dan Sikap Gizi Seimbang Remaja dalam Masa Pandemi Covid-19 di Kota Medan* [Universitas Sumaetra Utara]. https://repositori.usu.ac.id/handle/123456789/40373

Usman, H., Batjo, S. H., & Rista, N. (2019). Edukasi Bahaya Aborsi Melalui Layanan Whatsappdalam Meningkatkan Pengetahuan dan SikapRemajaPutri diSMA Negeri 3 Palu. *Jurnal Kesehatan Poltekkes Kemenkes RI Pangkalpinang*,

7(2), 50–55. http://jurnal.poltekkespangkalpinang.ac.id/index.php/jkp/article/view/86/pdf

Wahyuni, I. (2021). Pemanfaatan WhatsApp dalam Pemantauan Pola Tumbuh Kembang Bayi dan Balita Masa Pandemi Covid-19. *Jurnal ABDIMAS-HIP*, *2*(1), 14–27. http://akbidhipekalongan.ac.id/e-journal/index.php/abdimaship/article/view/126

Walters, C. N., Rakotomanana, H., Komakech, J. J., & Stoecker, B. J. (2019). Maternal determinants of optimal breastfeeding and complementary feeding and their association with child undernutrition in Malawi (2015-2016). *BMC Public Health*, *19*(1), 1–12. https://doi.org/10.1186/s12889-019-7877-8

Windasari, D. P., Syam, I., & Kamal, L. S. (2020). Faktor Hubungan dengan Kejadian Stunting di Puskesmas Tamalate Kota Makassar (Factors related to the incidence of stunting at the Tamalate health center in Makassar city). *Aceh Nutrition Jurnal*, *2020*(5), 27–34.

Yusriani, Y., & Acob, J. R. U. (2020). Education through WhatsApp Media in Changing of Smoking Behavior among Senior High School Students. *Jurnal Kesehatan Masyarakat Nasional (National Public Health Journal)*, *15*(3), 134–141. https://doi.org/10.21109/kesmas.v15i3.3270.