The Effect of Community Nutrition Education Innovation Based on Social Media Marketing on Knowledge, Attitude, And Behavior To Prevent *Stunting*

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ARTICLE INFO	ABSTRACT
Keywords : education, community nutrition, innovation, social media, *Stunting*	The Covid-19 pandemic has hampered *Stunting* prevention and alleviation programs so that facilities are needed to facilitate nutrition education during the pandemic. This study aims to test the innovation of public nutrition education based on social media marketing on Youtube, Facebook, Instagram, TikTok, and Twitter and to measure its effect on cognitive, affective, and behavioral changes. The research design used a quasi-experimental approach with one group pre-test and post-test designs. The research was carried out from September to December 2021. There were 89 respondents spread across five social media. The data were analyzed by using the different paired t-test. Overall for all social media, there was an increase in knowledge of 13.88 points, attitudes of 2.30 points and behavior of 5.81 points. In the three variables, by adding up the delta of change, the social media with the highest increase was TikTok (36.75), followed by Instagram (22.29), Twitter (20.25), Youtube (16.66) and Facebook (12.61).). Based on the different paired ttest, there are significant differences in knowledge, attitudes, and behavior. The social media that most resulted in changes in target knowledge was TikTok, while changes in target attitudes and behavior were most effective through social media Instagram. The implication of this research is that the findings can be used by stakeholders to promote the prevention and alleviation of *Stunting* problems more effectively and have a broad impact.
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1. INTRODUCTION

Stunting is a chronic malnutrition problem caused by lack of nutritional intake for a long time due to feeding that is not in accordance with nutritional needs. Based on the results of the 2019 Indonesian Toddler Nutritional Status Study (SSGBI), currently there are 27.67 percent of *Stunting* under-fives in Indonesia. Based on a total population of 23 million children under five in Indonesia, 6.3 million of them experience *Stunting* problems. This number exceeds the maximum standard value of the World Health Organization (WHO), which is 20 percent or one-fifth of the total number of children under five in a country. The prevalence of *Stunting* in Indonesia is higher than countries in Southeast Asia, and ranks fourth in the world. *Stunting* sufferers tend to get sick easily, have a posture that is not optimal as an adult, and have less cognitive abilities, which can result in long-term economic losses for Indonesia.

In relation to *Stunting*, the Covid-19 pandemic is an obstacle to implementing prevention and alleviation programs, including promotions or nutrition education. The Covid-19 pandemic still limits human movement, so various nutrition education cannot be done face-to-face. Meanwhile, one of the

factors that influence the occurrence of *Stunting* is knowledge of maternal nutrition. Nurhayati, Utami, and Irawan (2020) show that most *Stunting* children aged 2-5 years have normal weight after being given health education about *Stunting* nutrition. Furthermore, Amaliyah and Mulyati (2020) concluded that prevention through nutrition education and rehabilitation is an alternative model for preventing under-five malnutrition based on community empowerment. The findings of Suryati and Supriyadi (2019) also show that increasing knowledge about the nutritional needs of toddlers will increase knowledge about *Stunting* prevention in toddlers.

Based on information processing theory, the flow of information to the cognitive system starts from the input received by a person such as written things, problems to be solved, or events into the human information system which ends with output that can be stored in long-term memory, motor behavior or decisions (Miller, 2011). Several previous studies have focused on online nutrition education, including the study of Loehmer et al. (2018) which concluded that there was a significant relationship between age and interest in using online nutrition education with Facebook, text messages, and email as the most used social media applications of all age groups. Research by Subardjo et al. (2021) also concluded that the sources of information that respondents had access to in the last two months during the Covid-19 pandemic were virtual nutrition information such as television, Youtube, websites, WhatsApp groups, and social media.

The Kamasz study (2021) concluded that the promotion of a healthy lifestyle and physical activity among Poles via the web and social media during the Covid-19 pandemic was quite effective. Furthermore, Tsani et al. (2020) examines the effectiveness of providing online education to increase knowledge of health and nutrition during a pandemic in increasing knowledge (knowledge level). The results of the study by Khatimah and Laksmi (2019) show that the role of the individual can be increased as a relevant and reliable source in creating and disseminating information related to *Stunting* in Indonesia through social media. Thus, information makers need to pay attention to the characteristics of the target group and the media used in order to create an effective message (Yusuf, 2022)

Social media makes it easy to spread information from one individual to another, from everyone who is interested in having a two-way conversation (Aichner & Jacob, 2015). Social media with its ability to accelerate the flow of communication by encouraging contributions and social feedback is basically a mass communication tool that has a strong effect and influence. Social media marketing is the process of marketing a product or service through various social media channels. The social media marketing strategy is to manage social media, starting from determining content, scheduling uploads, attracting many followers, and so on. Based on this, it can be assumed that educational innovation through social media marketing can affect changes in people's knowledge, attitudes, and behavior (Basid, 2022).

This research is in line with the development of digital technology and the demands of a major force due to the Covid-19 pandemic and the new normal era which have an impact on mainstream nutrition education programs. The research approach with research and development and pre-experimental methods through five social media to analyze changes in knowledge, attitudes, and behavior of respondents is a novelty of this research. The purpose of this study was to identify the characteristics of respondents, the behavior of using social media, knowledge, attitudes, and behaviors in *Stunting* prevention, and to analyze the effect of social media marketing-based public nutrition education innovations on knowledge, attitudes, and behavior in *Stunting* prevention efforts.

2. METHODS

The study used a quasi-experimental design with one group pre-test and post-test. Quasi-experimentation is a type of experimental research in which respondents are not randomly assigned and the researcher is unable to control the variables under study. The research was conducted through social media. The research was carried out for four months from September to December 2021.

The intervention was carried out on nutrition education social media viewers with a total of 150 people who were determined voluntarily. The criteria for respondents are young women, pregnant women, or mothers with children under two years old and active users of social media. The research

flow begins with filling out the pre-test, where respondents fill out a questionnaire containing questions to measure knowledge, attitudes, and behaviors related to *Stunting* and ask respondents to choose the social media used to listen to intervention content. Interventions were carried out on Instagram, Twitter, Youtube, Facebook, and TikTok social media through content presented in accordance with the uniqueness of each social media. The assessment of Instagram social media content is divided into content in the form of carousels, reels, and IG TV. *Stunting* educational content uploaded on TikTok social media is divided into short videos with a duration of less than one minute and long videos with a duration of more than one minute. Content on Facebook and Twitter is uploaded in the form of images and videos. Content consisting of more than four images is uploaded in a series of tweets called threads. Twitter limits the length of uploaded videos, so video content is split into two tweets in one thread within a tweet. On Youtube, content is presented in the form of short videos that are uploaded to the short and long video features. The content provided is processed from the results of previous research related to *Stunting*, in-depth interviews with several experts, and Focus Group Discussions with stakeholders (BKKBN). Respondents who have filled out the pre-test are then invited to a WhatsApp group which is used as a means of delivering information related to research. After the number of respondents collected is balanced between the five social media, the intervention activity begins with the respondent listening to content according to the type of social media selected for ten days. The intervention was carried out simultaneously on all five social media from October 26 to November 4, 2021 with 14 content for each social media.

At the beginning of the study, there were 157 respondents who filled out the pre-test. After stating that they are willing to become a respondent and join the Whatsapp group, the research team informs the research timeline for 10 days to the respondents. Respondents are required to follow the social media "Solving *Stunting*" according to the media chosen by the respondent. The next step, the content in the form of videos and captions made by the researcher is uploaded every afternoon for 10 days on each social media. After uploading content on the five social media, announcements containing content updates and social media links for easy access were given through the Whatsapp group so that respondents immediately watched. The research team always urges respondents to watch on the spot and in accordance with the selected social media and reminds that compensation is only given to respondents who fill in according to the selected social media. However, in this study, no one-by-one checks were made on the participants' viewing activities. This can be one of the weaknesses of this study because participants may pile up content and watch together with other content. Efforts to control research data bias, for example the possibility of respondents not listening to the content provided or even listening to *Stunting*-related content from other sources, are only done by reminding them through Whatsapp groups. Moreover, this study applies a quasi-experimental design where the researcher is not able to control the sample and the variables studied.

Constraints experienced related to intervention respondents included: (1) Respondents filled in an invalid WhatsApp number so they could not be invited to the research group. This is due to the fact that the intervention time started quite far from the time the search for respondents was opened and the intervention time was quite long (10 days) so that many respondents withdrew from the study; (2) There are respondents whose Facebook accounts cannot be accessed because they have forgotten their passwords (it is rarely used) so they cannot continue the research; (3) Respondents listen on different social media from the initial choice. Most respondents want to listen on Instagram compared to other social media so that Instagram is the first to fulfill its quota, followed by Youtube, Twitter, TikTok, and finally Facebook. This caused the number of respondents not to meet the target at the end of the experiment and the participation rate of respondents in this study was 56.7 percent (89 respondents at the end of the intervention). The number of initial respondents on Facebook was 31 people, reduced to 8 people at the end of the intervention. Furthermore, on Instagram, initially there were 36 people to 48 people. For TikTok, Twitter, and Youtube, each of the initial 30 respondents decreased to 10, 10, and 13 people, respectively; and (4) Respondents listened not according to the upload schedule, but at the same time at the end.

The social media that was tested was in accordance with the social media used most often by the respondents. The final number of respondents for the five social media is not representative due to

various obstacles faced. However, this study is an experiment (experimental) that does not require a large number of samples. In addition, this research will still be continued with a quasi-experimental without any conditioning because people do not routinely access one particular social media every day but tend to read or watch content at one time.

The research instrument measures the knowledge, attitudes, and behavior of respondents related to *Stunting*. Knowledge is information owned by respondents regarding *Stunting* in children. Knowledge consists of 20 multiple choice questions developed by researchers regarding general knowledge about *Stunting*, parenting in *Stunting* prevention, *Stunting* risk factors, *Stunting* prevention and impact. On the instrument, the wrong score is 0 and the correct score is one with Cronbach's alpha for knowledge of 0.553. The greater the score, the better the knowledge possessed by the respondent.

Attitude is a form of respondent's assessment of *Stunting* to determine behavior in *Stunting* prevention. Attitudes were measured using a questionnaire which was developed by researchers with components consisting of *Stunting* prevention and *Stunting* impacts. The instrument consists of 15 question items with a Likert scale of 1 to 4 (1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree) with Cronbach's alpha for attitude of 0.924. The greater the score, the better the attitude of the respondent.

Behavior in general consists of 10 items, special behavior of pregnant women consists of 5 items, and behavior of mothers with children under two years consists of 10 items. Behavior is the behavior of individuals in preventing *Stunting* in children. The research instrument was developed by the researcher using a scale.

Likert 1 to 5 (1=never, 2=rarely, 3=sometimes, 4=often, 5=always) with Cronbach's alpha for behavior of 0.787. The greater the score, the better the behavior of the respondent. Behavioral measurement indicators show the frequency of seeking information about *Stunting*, whether to prepare yourself in terms of maintaining health before starting a family, the frequency of consuming nutritious food according to the recommendations of the contents of my plate, the frequency of doing sports/physical activities, the frequency of breakfast, the frequency of attending education (webinar, training) related to *Stunting* or health, frequency of exposure to information about *Stunting*, frequency of taking supplements (vitamins, iron), frequency of implementing a clean/healthy lifestyle, and frequency of seeking information on reproductive health.

The data obtained were analyzed using the Statistical Package for Social Science (SPSS) 25.0 for Windows. Descriptive analysis was used to generate the mean, standard deviation, minimum, and maximum values for all research variables. The data obtained on the variables of knowledge, attitude, and behavior were transformed into an index. The index is then categorized into low, medium, and high. The low category has an index of less than 60, medium with an index of 60.01 – 80, and high with an index of more than 80 (Sunarti, 2001). Furthermore, to analyze the differences in knowledge, attitudes, and behavior of respondents after receiving intervention through five social media, paired t-test was used.

3.   RESULTS AND DISCUSSION
Characteristics of Respondents
Age.

Respondents of this study amounted to 89 people who came from Facebook users 8 people (9.0%), Instagram 48 people (53.9%), TikTok 10 people (11.2%), Twitter 10 people (11.2%), and Youtube 13 people (14.6%). The largest proportion of respondents aged 18-24 years was 69.7 percent, followed by respondents aged 25-29 years as much as 13.5 percent, respondents aged 30-34 years as much as 14.6 percent, and respondents aged 35-39 years as many as 2, 2 percent. The ideal age to get pregnant is when women are in their childbearing age, which is in the age range of 20 to 35 years. The total number of respondents aged between that age was 97.8 percent. This is in accordance with the target of *Stunting* prevention education. Based on the media used when selected as respondents, it appears that Facebook users tend to be over 30 years old, while Instagram, TikTok, and Twitter and Youtube users tend to be under 30 years old, even almost the majority of Youtube users (92.3%) are 18 years old. -24 years old.

Level of education. The level of education will greatly influence a person to think critically in finding and processing information. The level of education is dominated by respondents with the latest education being high school graduates amounting to 53.9 percent. The second place is occupied by respondents with an undergraduate education level (S1) as much as 33.7 percent, and the remaining respondents with a postgraduate education level (S2) amounting to 9.0 percent and diplomas as much as 3.4 percent.

Social Media Usage Behavior

The first rank of the most frequently used type of social media is Instagram which was chosen by 71.9 percent of respondents. Only 9.0 percent of respondents chose TikTok and Youtube, 5.6 percent chose Facebook, and 4.5 percent chose Twitter as the most used social media (Table 1). Almost half (47.2%) of respondents use social media less than 5 hours/day, not much different from the proportion of respondents who use social media 5 – 10 hours/day (50.6%). The information most respondents searched for on social media was entertainment (73.0%), followed by knowledge (24.7%), and online shopping (2.2%). Although Instagram is generally used to seek entertainment, respondents also suggested Instagram (58.4%) as a medium for delivering *Stunting* prevention educational messages, followed by TikTok as second (14.6%), and Youtube as third (12.4%)).

Knowledge, Attitude, and Behavior in *Stunting* Prevention Efforts

Table 1 behavior of using social media by type of platform used by respondents

Responden berdasarkan platform

social media usage behavior	facebook (n=8)	instagram (n=48)	tick tock (n=10)	twitter (n=10)	youtube (n=13)	total (n=89)
Most used social media						
Facebook	50.0	2.1	0.0	0.0	0.0	5.6
Instagram	50.0	81.3	70.0	53.8	53.8	71.9
tiktok	0.0	10.4	20.0	7.7	7.7	9.0
twitter	0.0	2.1	0.0	0.0	0.0	4.5
youtube	0.0	4.2	10.0	38.5	38.5	9.0
average use of social media						
< 5 hours/day	62.5	60.4	20.0	15.4	15.4	47.2
5-10 hours/day	37.5	35.4	80.0	84.6	84.6	50.6
10 hours/day	0.0	4.2	0.0	0.0	0.0	2.2
most searched information						
online shopping	0.0	4.2	0.0	0.0	0.0	2.2
entertainment	62.5	66.7	100.0	60.0	92.3	73.0
knowledge	37.5	29.2	0.0	40.0	7.7	24.7
social media is most suitable for *Stunting* education so that the message reaches the target						
Facebook	37.5	4.2	10.0	10.0	0.0	7.9
Instagram	37.5	64.6	40.0	70.0	53.8	58.4
tiktok	0.0	20.8	30.0	0.0	0.0	14.6
twitter	0.0	6.3	0.0	20.0	7.7	6.7
youtube	25.0	4.2	20.0	0.0	38.5	12.4

Description: n= number

Table 2 distribution of respondents by category of knowledge and social media

Social media	Low Index <60)	Medium (Index 60-80)	Index Height (>80)	Average	elementary school	Min	Max
Pre-test							
Facebook (n=8)	0.0	50.0	50.0	83.75	9.54	70.00	100.00
Instagram (n=48)	22.9	22.9	22.9	69,90	16.68	25.00	95.00
Tik Tok (n=10)	20.0	30.0	30.0	72.50	17.36	35.00	95.00
Twitter (n=10)	0.0	40.0	40.0	79.50	13.22	60.00	100.00
Youtube (n=13)	15.4	38.5	38.5	73.46	18.53	35.00	100.00
Total (n=89)	16.9	30.3	30.3	73.03	16.49	25.00	100.00
post-test							
Facebook (n=8)	0.0	87.50	87.50	91.88	9.61	70.00	10.00
Instagram (n=48)	6.30	62.50	62.50	84.17	16.42	30.00	10.00
Tik Tok (n=10)	0.00	100.00	100.00	94.00	6.15	85.00	10.00
Twitter (n=10)	0.00	100.00	100.00	93.00	6.32	85.00	10.00
Youtube (n=13)	7.70	61.50	61.50	83.85	14.60	55.00	10.00
Total (n=89)	4.50	73.00	73.00	86.91	14.35	30.00	10.00

Description: n-=sum

Knowledge in *Stunting* prevention efforts.

Based on the distribution of respondents' knowledge during the pre-test on each social media presented in Table 2, half of the respondents (50.0%) who chose Facebook social media were in the high knowledge category, with an average knowledge index of 83.75 which was the highest average. compared to other social media. One in five respondents from TikTok (20%) and Instagram (22.9%) fall into the category of low knowledge, with the lowest average knowledge index being on social media Instagram (69.90). The average total knowledge index during the pre-test was 73.03 with a minimum value of 25 and a maximum of 100.

The post-test results show that all respondents who choose TikTok and Twitter social media have knowledge in the high category with the average index reaching 94.00 and 93.00, respectively. The low knowledge category is still filled by respondents who choose Instagram (6.30) and Youtube (7.70) social media. The overall post-test knowledge index average reached 86.91 with a minimum score of 55 and a maximum of 100. If sorted by the average knowledge index achieved during the post-test, TikTok social media ranked first, followed by Twitter, Facebook, Instagram, and finally Youtube. The lowest average posttest score is on items related to knowledge about risk factors for *Stunting* in children (62.9%) and the impact of *Stunting* (76.4%). Knowledge questions with the lowest correct answers (pre-test) were knowledge about risk factors for *Stunting* in children (34.8%) and the first 1000 days of life (58.4%). However, after giving the intervention, the answers to both aspects increased to 62.9 percent and 80.9 percent (post-test).

Attitude in *Stunting* prevention efforts. Based on the results of the pre-test of attitude measurement in *Stunting* prevention efforts in Table 3, all respondents who chose social media Twitter were in the high category with an average attitude index of 96.67. Attitudes in *Stunting* prevention efforts in the low category are still owned by respondents on social media Youtube (7.70%) and Instagram (2.10%). The results also show that one in four respondents on Facebook media, one in five respondents on TikTok media, and one in eight Instagram respondents fall into the moderate category on the attitude aspect in *Stunting* prevention efforts. Overall, the average attitude index reached 91.12 with a minimum index value of 55 and a maximum of 100. The social media with the lowest average attitude score was Facebook while the highest was Twitter.

The results of the post-test related to attitudes in *Stunting* prevention efforts (Table 3) show that all respondents on TikTok and Twitter media are in the high category with an average index of 96.33 and 97.17, respectively. After the intervention, there were still respondents with social media Youtube (7.7%) who had attitudes in the low category. Respondents in the medium category are owned by social media Facebook (12.5%) and Instagram (14.6%). Based on the order of social media, the highest average index achievement is owned by social media Twitter, TikTok, Youtube, Instagram, and Facebook. The average attitude index in the effort to prevent *Stunting* in the post-test is in the high category (93.43) with a minimum value of 30 and a maximum of 100. The average score of attitude statements in the post-test *Stunting* prevention effort is the lowest in the item stating that *Stunting* causes economic loss (4.36). This shows that there are still respondents who are not aware that *Stunting* causes economic losses. Meanwhile, the statement with the highest average score was the statement regarding the provision of nutritious food according to the child's age to prevent *Stunting* (4.87).

Behavior in *Stunting* prevention efforts.
The results showed that in terms of *Stunting* prevention behavior based on the pre-test results, only Instagram (8.3%) and Twitter (10%) had respondents with high categories. More than half of the total respondents (52.8%) are in the medium category, and two out of five (41.6%) of the respondents are in the low category with a total average score of only 59.27. If sorted based on the average behavior index achieved during the pre-test, social media Twitter has the first rank, followed by Facebook, Instagram, and Youtube (Table 4). Based on the results of the post-test related to behavior in *Stunting* prevention, which are presented in Table 4, the average index achievement in total is in the medium category range (65.08) with the largest average value being Twitter social media (69.00). The social media with the lowest average index on the behavioral post-test results is owned by the social media TikTok (60.00). The results show that more than a quarter of the respondents (29.20%) are still in the low category. Three out of five respondents (61.80%) are in the moderate category. While the high category shows the lowest distribution of respondents (9%). The lowest average score of behavior in *Stunting* prevention efforts is related to participation in education (webinar, training) about *Stunting* or health (2.93). The results of the distribution of the average behavioral score in the effort to prevent *Stunting* also show that the highest change in pretest to post-test scores is found in the intensity of seeking information about *Stunting* ($\Delta=0.53$).

Table 3 Distribution of Respondents Based on Attitudes and Social Media Categories

Social media	Low Index (Index <60)	Medium (Index 60-80)	Index Height (>80)	Average	elementary school	Min	Max
Pre-test							
Facebook (n=8)	0.0	25.0	75.0	89.58	9.12	75.00	100.00
Instagram (n=48)	2.1	12.5	85.4	90.03	9.75	58.33	100.00
Tik Tok (n=10)	0.0	20.0	80.0	90.83	9.37	76.67	100.00
Twitter (n=10)	0.0	0.0	100.0	96.67	3.24	90.00	100.00
Youtube (n=13)	7.7	7.7	84.6	92.05	12.70	55.00	100.00
Total (n=89)	2.2	12.4	85.4	91.12	9.69	55.00	100.00
post-test							
Facebook (n=8)	0.00	12.50	87.50	91.25	9.61	70.00	100.00
Instagram (n=48)	0.00	14.60	85.40	92.53	16.42	30.00	100.00
Tik Tok (n=10)	0.00	0.00	100.00	96.33	6.15	85.00	100.00
Twitter (n=10)	0.00	0.00	100.00	97.17	6.32	85.00	100.00
Youtube (n=13)	7.70	0.00	92.30	92.95	14.60	55.00	100.00
Total (n=89)	1.10	9.00	89.90	93.43	14.35	30.00	100.00

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Table 4 Distribution of Respondents by Behavior Category and Social Media

Social media	Low Index <60)	Medium (Index 60-80)	Index Height (>80)	Average	elementary school	Min	Max
Pre-test							
Facebook (n=8)	25.0	75.0	0.0	62.50	8.76	47,50	70.00
Instagram (n=48)	39.6	52.1	8.3	60.42	16.42	25.00	100.00
Tik Tok (n=10)	70.0	30.0	0.0	50.25	50.25	27.50	77.50
Twitter (n=10)	30.0	60.0	10.0	62.75	62.75	37.50	82.50
Youtube (n=13)	46.2	53.8	0.0	57.31	57.31	35.00	72.50
Total (n=89)	41.6	52.8	5.6	59.27	59.27	25.00	100.00
post-test							
Facebook (n=8)	25.00	62.50	12.50	65.31	65.31	50.00	90.00
Instagram (n=48)	29.20	60,40	10,40	65.94	65.94	20.00	97.50
Tik Tok (n=10)	40.00	50.00	10.00	60.00	60.00	37.50	87.50
Twitter (n=10)	20.00	70.00	10.00	69,00	69,00	37.50	87.50
Youtube (n=13)	30,80	69,20	0.00	62.69	62.69	45.00	75.00
Total (n=89)	29.20	61.80	9.00	65.08	65.08	20.00	97.50

Information: n= number of respondents; elementary school; Standard Deviation

The Effect of Social Media Marketing-Based Community Nutrition Education Innovation on Changes in Knowledge, Attitudes, and Behaviors
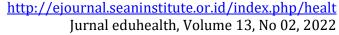
Based on the results of the average knowledge, attitudes, and behavior indices in *Stunting* prevention efforts in Table 5, all variables have an increase in the average index value where the post-test average value is higher than the pre-test. This indicates the success of the intervention carried out in the study. The highest average index is owned by the attitude variable, both pre-test and post-test, while the behavior variable is the variable with the lowest average index. The results also showed that the average index of knowledge (86.91) and attitude (93.43) variables in the post-test was in the high category, but the average index of the behavioral variable only reached the medium category (65.08).

Based on the results of the different pre-test and posttest variables on each social media, the knowledge variable on all social media experienced a significant positive change because the post-test value was higher than the pre-test value with the highest and significant change being on TikTok social media. (Δ=21.50). In the attitude variable, only Instagram social media experienced a significant positive change (Δ=2.50). Meanwhile, other social media experienced a change in the average value which increased but was not significant. In behavioral variables, all social media experienced significant positive changes except Facebook social media.

Overall, on all social media, there was an increase in knowledge by 13.88 points, attitudes by 2.30 points, and behavior by 5.81 points. The highest increase was found on TikTok, while the lowest on Facebook for knowledge and behavior. The lowest change is in attitude. In general, for the three variables, by adding up the deltas of change, the order of social media with the highest increase is TikTok (36.75), Instagram (22.29), Twitter (20.25), Youtube (16.66) and Facebook (12.61). Interventions carried out through social media that produced the highest change in general were on TikTok with an increase in knowledge of 21.50, attitude 5.50, and behavior 9.75.

The results of the different paired t-test showed that there was a significant difference between the average pre-test index and the posttest average index on the variables of knowledge (p=0.000), attitudes (p=0.002), and behavior (p=0.000). The average post-test index of each variable is higher than the average pre-test index. These results indicate that there was a significant increase in respondents' knowledge, attitudes, and behavior after the intervention was given (Table 5).

Table 5. Knowledge Index, Attitude and Behavior Pre and Post Intervention Test

Social media	Knowledge			Attitude			Behavior		
	Pre	Post	Delta	Pre	Post	Delta	Pre	Post	Delta
Facebook (n=8)	83.775	91.88	8.13*	89.58	91.25	1.67 tn	62.50	65.31	2.81 tn
Instagram (n=48)	69,90	84.17	14.27**	90.03	92.53	2.50*	60.42	65.94	5.52**
Tik Tok (n=10)	72.50	94.00	21.50**	90.83	96.33	550 tn	50.25	60.00	9.75*
Twitter (n=10)	79.50	93.00	13.50**	96.67	97.17	0.50	62.75	69,00	6.25*
Youtube (n=13)	73.46	83.85	10.38*	92.05	92.95	0.90	57.31	62.69	5.38
average	73.03	86.91	13.88**	91.12	93.43	2.30**	59.27	65.08	5.81
SD	16.49	14.35		9.69	9.10		14.57	14.47	
P-Value		0.000**			0.002**			0.000**	

Description: n: number of responses; SD: Standard Deviation; *significant at p<0.05; ** significant at p<0.05; tn is not significant at p<0.05

Discussion

In this study, the intervention was carried out on social media Instagram, Twitter, Youtube, Facebook, and TikTok through content presented in accordance with the uniqueness of each social media. The results showed that the most frequently used social media by respondents was Instagram. Instagram is one of the social media that can be used to share photos and information to its users. Social media is used by business people to market products and services as commercial marketing, as well as by non-profit organizations or individuals as well as to carry out social marketing. The results showed that half of the respondents used social media for 5-10 hours per day with the aim of seeking entertainment.

All respondents who choose TikTok and Twitter social media have knowledge that is categorized as high. If sorted based on the average knowledge index achieved during the post-test, TikTok social media has the first rank, followed by Twitter, Facebook, Instagram, and Youtube. The results of this study are supported by previous research which states that TikTok has the potential to be a valuable and influential platform for conveying information about important health matters (Basch, Hillyer, & Jaime, 2020; Zhu et al., 2020).

Knowledge of risk factors and the impact of *Stunting*, one of which can be seen from the mother's education factor because it has the most dominant relationship with the incidence of *Stunting* experienced by children. Mothers with good education tend to be more aware of the health of their children (Rahmawati, Fajar, & Idris, 2020; Setiawan, Machmud, & Masrul, 2018).

The knowledge of the respondents with the lowest index during the pre-test was related to knowledge of the risk factors for *Stunting* in children and the first 1000 days of life, but after being given the intervention, the answers to both items increased. This is in line with the research of Alfridsyah, Ichsan, and Miko (2013) which states that health-related education can increase mother's knowledge, one of which is *Stunting* prevention. One of the media that can increase knowledge in *Stunting* prevention efforts is audiovisual media (Arsyati, 2019). In addition, virtual nutrition information media is a source of information that can be accessed during the Covid-19 pandemic (Subardjo et al., 2021).

The lowest average attitude index in *Stunting* prevention efforts (post-test) is in the item stating that *Stunting* causes economic losses. This shows that there are still respondents who do not feel that *Stunting* causes economic losses. While the item with the highest average score is a statement related to providing children with nutritious food according to age to prevent children from being stunted. These results indicate that respondents already have a good attitude regarding feeding children. These

results are in line with research which states that media exposure and education increase knowledge of child and maternal nutrition and lead to better feeding practices for children (Dewi & Aminah, 2016; Mzumara et al., 2018; Ulfani, Martianto, & Baliwati, 2011).

Based on the results of the average score on the statement of attitude variables in an effort to prevent *Stunting*, the change in the pre-test score to the highest post-test was found in the statement that *Stunting* causes economic losses and the first 1000 days of life determine whether a child becomes stunted or not. The interventions carried out succeeded in changing attitudes regarding the impact and risk factors of *Stunting*. The results of this study support previous research which showed that mother's knowledge increased after the intervention, especially regarding information on 1000 HPK which was a risk factor for *Stunting* (Parisudha, 2020).

The lowest mean score of behavior in *Stunting* prevention efforts is shown in participation in education related to *Stunting* or health. These results are in line with the research of Mutiara et al. (2019) which shows that the low participation of parents in educational activities to improve children's growth and development is because most of the time they have for work. Meanwhile, the item with the highest average behavioral score related to the application of a clean and healthy lifestyle was asked in the form of how often to apply a clean/healthy lifestyle. This behavior is relatively measurable changes within 10 days of intervention. Based on the results of Karo's research (2020), education related to health can increase awareness and knowledge regarding the urgency to maintain a healthy environment and practice a clean and healthy lifestyle. Providing education about a clean and healthy lifestyle (PHBS) can help the community to avoid various diseases, one of which is a risk factor for *Stunting*.

The average behavioral score in the effort to prevent *Stunting* shows that the highest change in pre-test to post-test scores is found in the intensity of seeking information about *Stunting*. This is in line with Uswah's statement (2014) that the generation born after the 90s is a generation that is current and fast in operating technology or social media, one of which is to find information. Respondents in this study are also Generations Y and Z so that the search for health information is an easy behavior to do. The results also show that the average knowledge and attitude index on the post-test is in the high category, but the average behavior index only reaches the medium category. Interventions carried out only in a short time have not been able to change the behavior of respondents. The results of research on nutrition education through Instagram for young women by Rusdi, Auliya, and Helmizar (2020) also show that this intervention has not been able to encourage increased knowledge and attitudes that can change the actions of young women.

Knowledge is the variable that has the highest increase in index from pre-test to post-test. This is in line with the research results of Waryana, Sitasari, and Febritasanti (2019) that providing education to women has a significant effect on increasing knowledge which is higher than the attitude variable. Based on the results of the different pre-test and posttest variables on each social media, the knowledge variable of all social media experienced a significant positive change where the post-test value was higher than the pre-test value with the highest and significant change being on social media. TikTok. In line with previous research which showed that access to information affects a person's knowledge, the better access to information one has, the better one's knowledge will be (Yuliati, Simanjuntak, & Oktriyanto, 2019; Djamaludin, Simanjuntak, & Rochimah, 2012). In the attitude variable, only Instagram social media experienced a significant positive change while other social media experienced a change in the average value which increased but was not significant. In behavioral variables, all social media experienced significant positive changes except Facebook social media. This finding is reinforced by Mazman and Usluel (2010) that Facebook allows individuals to exchange ideas, share information, and work collaboratively with people who have the same interests, ideas, and needs. Facebook helps people learn collaboratively in academic groups who are connected to their educational environment and carry out teamwork by sharing homework, projects or ideas. Dalsgaard (2016) also found that Facebook groups have educational potential for peer-to-peer learning. Thus, Facebook is relatively effective in generating behavioral changes in its users.

Interventions carried out through social media that resulted in very significant positive changes in knowledge were through social media TikTok, on attitudes were through social media Instagram,

and on behavior was through social media Instagram. The results of this study are not in line with the research results of Rusdi et al. (2020) which shows that there is an effective effect of nutrition education using Instagram on changes in knowledge about balanced nutrition in adolescent girls, but there is no difference in attitudes and behavior. This is due to the image and video features on Instagram that can support the delivery of information more effectively. In addition, the research results of Indriani et al. (2019) showed that the average score of students' knowledge increased after being given the intervention. Nutrition education that involves receiving information through infographics can support increasing respondents' knowledge, because the information received visually will be processed at once by the brain. Utami, Probosari, and Fatmawati (2015) in their research on educational interventions through social media Instagram for high school students found that Instagram can be an educational aid media that increases the average test score of the intervention group compared to the control group.

The results of the different paired t-test showed that there was a significant difference between the average pre-test index and the posttest average index on the variables of knowledge (p=0.000), attitudes (p=0.002), and behavior (p=0.000). The average post-test index for each variable is higher than the average pre-test index. That is, there was a significant increase in the knowledge, attitudes, and behavior of respondents after the intervention was given. This result is in line with previous research which stated that the educational intervention provided was able to increase knowledge, attitudes, and behavior in *Stunting* prevention efforts (Ervin, Abbas, & Muchlis, 2020; Nurlinda & Sari, 2021). In addition, the results of research by Zikri, Yuliati, and Simanjuntak (2019) also show that the socialization of TV advertisements (media) has an effect on changes in student attitudes.

Although social media has its limitations, many experts argue that the use of social media has a positive impact on social marketing activities. The way that organizations can do to change the behavior of target targets is through optimally planned social media management (Negara, 2018). Currently, TikTok can be used as a positive medium by Generation Z, specifically education and activism media. TikTok as a media for education and activism is useful in seeking knowledge and new things (Firamadhina & Krisnani, 2020). Instagram has been proven to be a nutritional education media that increases the knowledge of young women, considering that young women generally have personal Instagram accounts and can access educational content anywhere and anytime (effendi, 2022)).

4. CONCLUSION

The results of the research indicate that knowledge, attitudes, and behavior in *Stunting* prevention efforts have an increase in the average posttest index value which is higher than the pre-test and is significantly different. This indicates the success of the intervention carried out in the study. The highest average index is owned by attitudes, both pre-test and post-test, while behavior is the variable with the lowest average index. The average knowledge and attitude index on the post-test is in the high category, but the average behavior index only reaches the medium category. In general, the sum of the deltas of change for the three variables shows that the social media with the highest increase is TikTok, followed by Instagram, Twitter, Youtube, and Facebook. The most effective social media in producing changes in target knowledge is TikTok, while changes in target attitudes and behavior are most effectively carried out through Instagram social media. The results of this research are very strategic, beneficial for the community, and can be applied on a wide scale. The output of this activity can be utilized by the BKKBN and related stakeholders to promote the prevention and alleviation of *Stunting* problems more effectively and with a broad impact. Based on the research findings, it is recommended that *Stunting* education be carried out by the BKKBN and related parties using TikTok and Instagram media.

One of the limitations of this study was the number of respondents who did not meet the initial target set due to various obstacles in recruiting and retaining respondents until the end of the intervention activity. In addition, it is possible for respondents to get material about *Stunting* from other sources. The uneven distribution of respondents on each social media causes the influence of the intervention on social media other than Instagram to be poorly described. Another limitation is that

the respondent's time to listen to the content is not monitored, allowing respondents to listen to all of the content at the same time at the end of the study instead of following a set schedule. For further research, it is necessary to study social media parameters such as openness, conversation, community, and participation

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