

Keperawatan Fikes Unigal

The Effect of Nutritional Education Through Digital Media on Mothers Behaviour Regarding Nutritional Intake of Under-five...

 Artikel 2

 JKG

 Universitas Galuh

Document Details

Submission ID

trn:oid::1:3573060093

Submission Date

May 18, 2026, 10:13 AM UTC

Download Date

May 18, 2026, 10:24 AM UTC

File Name

MJMHS_1834_3.pdf

File Size

122.9 KB

7 Pages

5,043 Words

28,638 Characters

4% Overall Similarity

The combined total of all matches, including overlapping sources, for each database.





Filtered from the Report

- ▶ Bibliography
- ▶ Quoted Text




Exclusions

- ▶ 56 Excluded Matches

Match Groups

-  **5 Not Cited or Quoted 2%**
Matches with neither in-text citation nor quotation marks
-  **2 Missing Quotations 2%**
Matches that are still very similar to source material
-  **0 Missing Citation 0%**
Matches that have quotation marks, but no in-text citation
-  **0 Cited and Quoted 0%**
Matches with in-text citation present, but no quotation marks

Top Sources

- 4%  Internet sources
- 2%  Publications
- 1%  Submitted works (Student Papers)

Integrity Flags

0 Integrity Flags for Review

No suspicious text manipulations found.

Our system's algorithms look deeply at a document for any inconsistencies that would set it apart from a normal submission. If we notice something strange, we flag it for you to review.

A Flag is not necessarily an indicator of a problem. However, we'd recommend you focus your attention there for further review.

Match Groups

- 5 Not Cited or Quoted 2%**
Matches with neither in-text citation nor quotation marks
- 2 Missing Quotations 2%**
Matches that are still very similar to source material
- 0 Missing Citation 0%**
Matches that have quotation marks, but no in-text citation
- 0 Cited and Quoted 0%**
Matches with in-text citation present, but no quotation marks

Top Sources

- 4% Internet sources
- 2% Publications
- 1% Submitted works (Student Papers)

Top Sources

The sources with the highest number of matches within the submission. Overlapping sources will not be displayed.

1	Internet	repository.unigal.ac.id	1%
2	Internet	irep.iium.edu.my	<1%
3	Internet	journal.stikep-ppnijabar.ac.id	<1%
4	Internet	ejournal.poltekkesaceh.ac.id	<1%
5	Internet	www.radiantinsights.com	<1%
6	Internet	jurnal.bsmi.or.id	<1%
7	Internet	mededu.jmir.org	<1%

ORIGINAL ARTICLE

The Effect of Nutritional Education Through Digital Media on Mothers Behaviour Regarding Nutritional Intake of Under-five Children in Sukadana Village Ciamis Regency

Daniel Akbar Wibowo¹, Yulia Lanti Retno Dewi², Nur Hafidha Hikmayani³, Hartiah Haroen⁴, Dini Nurbaeti Zen⁵

¹ Doctoral Student of Public Health Sciences, Faculty of Medicine, Sebelas Maret State University, Surakarta, Indonesia

² Department of Nutrition Faculty of Medicine, State University of Sebelas Maret, Surakarta, Indonesia

³ Faculty of Medicine, State University of Sebelas Maret, Surakarta, Indonesia

⁴ Faculty of Nursing, Universitas Padjadjaran, Bandung, Indonesia

⁵ Faculty of Health Sciences, Galuh University, Ciamis, Indonesia

ABSTRACT

Introduction: Malnutrition among under-five children remain major public health concern in Indonesia. Inadequate feeding practice, low dietary diversity, and low intake of animal source food (ASF) was reported as a determinant factor that contribute to this problem. ASF which contains essential nutrients, is needed for optimal growth and development. However, the level of knowledge and behavior that support ASF intake is still not optimal, even though it has been supported by conventional nutrition education programs. Hence, this study aims to investigate the effect of nutritional education through digital media on parent behaviour regarding ASF intake. **Methods:** This quasi-experimental study, using a pre-posttest design, was conducted on 150 respondents selected through stratified purposive sampling. Nutritional education was provided through digital media, and changes in parental behaviour before and after the intervention were assessed using a questionnaire. The data were analyzed using descriptive statistics and correlational analysis, with a paired t-test to evaluate the intervention effectiveness. **Results:** Nutritional education through digital media significantly improved parents' behavior regarding ASF intake for under-five children ($p = 0.000$), with most parents achieving the good behavior criteria after intervention (84.0%). **Conclusion:** Digital media can be an effective tool to increase parent' understanding and awareness of the importance of ASF intake. Integrating digital media into nutrition promotion programs is essential for personalized education and community engagement in stunting prevention. Future development should address accessibility, digital literacy, and broader public health integration.

Malaysian Journal of Medicine and Health Sciences (2025) 21(6): 1-7. doi:10.47836/mjmhs.v21.i6.1414

Keywords: Nutritional education, Digital media, Animal source food, Parent behaviour, Toddler children

Corresponding Author:

Daniel Akbar Wibowo, M.Kep
Email: daniel1984@student.uns.ac.id
Tel: +085223230428

INTRODUCTION

Malnutrition is recognized as a significant public health concern among under-five children, especially in low- and middle-income countries (LMIC) (1). Malnutrition problems are usually characterized by high rates of stunting, wasting, and underweight (2). Although sub-national data for LMIC shows considerable improvement, mortality rates was relatively increased in under-five children due to the undernutrition (3). This

condition also worsens by socio-economic disparities, food insecurity, and increased vulnerability to infection within under-five children (4,5). Indonesia as part of LMIC also faces similar problems, with high rates of stunting (21,5%) as reported by the Ministry of Health of the Republic of Indonesia in 2023 (6). Although various stunting prevention program have been launched, these efforts seems insufficient to reach the WHO standard for stunting prevalence is that it should be less than 20% (7). Considering this problem may have long-term impact on physical and cognitive development, nutritional problems in under-five children remains a priority that needs to be addressed (8).

Nutritional intake is a key component in maintaining

a healthy nutritional status, thereby supporting the growth and development of under-five children (9,10). Adequate intake of essential nutrients such as protein, vitamins, and minerals during pregnancy and the first 1000 days of life, can prevent chronic malnutrition which is the main cause of stunting (11,12). Recent study from Indonesia, inadequate feeding practices, low dietary diversity, and low intake of animal source foods (ASF) was reported as a determinant factor that contribute to child stunting (13,14). Several studies also argue that, low intake of ASF is driven by several factors including socio-economic limitations, insufficient knowledge about nutrition, and cultural factors (15–17). In alignment with the government efforts to reduce socio-economic disparities, families with under-five children need to be encouraged to actively participate in improving nutritional intake through adequate nutritional education (18,19). Despite the importance role of both parent in nurturing their children, mothers are more likely to play an essential role in household affairs especially in improving nutritional intake (20). Improving mothers' knowledge regarding nutritional aspects would have a significant effect on childcare practices and influence food choices (12,21). Therefore, it is important to improve parental knowledge about nutrition to improve ASF intake.

Although many nutritional education programs have been carried out conventionally, such as direct counselling at integrated health posts or other health services, the level of understanding and changes in parent behaviour in fulfilling ASF intake in under-five children is not yet optimal (22). Previous study highlight that low maternal education level and restriction on mothers ability to access vital information regarding under-five children nutritional needs are ultimately affecting their children dietary intake and overall health (23). Improving access to nutritional information for parents with under-five children can be achieved through several strategies. According to previous evidence, utilizing interactive platforms such as mobile apps and websites can engage parent or caregivers to monitor their children's eating habits (24). These platforms also include gamification elements that make learning about nutrition fun, thereby increasing user engagement and information retention (25).

Along with the development of technology, digital media offers great potential in reaching the wider community in effective and efficient manner. According to We Are Social 2023, internet penetration in Indonesia reached 76.8%, with most users are active on social media. This shows that digital media has a potential to reach wide range of users and can be used as an effective educational tool (26). However, research examining the effect of nutritional education through digital media on changes in maternal behaviour, especially in increasing ASF intake among under-five children is still limited (27). In contrast, most previous studies focus more

on nutritional education in general without paying attention to the aspects of the media used and its impact on specific behaviour changes. Therefore, this study is expected to provide new insights into a more effective way to increase mothers' understanding and awareness of the importance of ASF intake for under-five children, and encourage positive behaviour change through digital media.

MATERIALS AND METHODS

Study Design & Setting

This quasi-experimental study was conducted to determine the effectiveness of nutritional education regarding ASF intake by involving 150 participants from Sukadana Village. Sukadana Village is one of the areas in Ciamis Regency, West Java Province, which is reported to face major challenges related to stunting with a stunting prevalence reaching 20.2% in 2022 (28). A stratified purposive sampling technique was used to select at least 50 respondents from three village regions: Sukamaju, Ciilat, and Kedung. The participant criteria for this study included parents, both mothers or fathers, with under-five children, particularly those who have access to digital media and are actively involved in managing their children's nutrition. This sampling method was employed to ensure that each socio-economic group was represented in each region. However, as a non-probability sampling technique, there may be subjectivity and unintended bias in the sample selection process. In addition, the selected samples may not be well-defined or may not fully represent the population. Structured nutritional education on ASF intake in under-five children was delivered to participant using smartphone-based educational video. The main content delivered in this nutrition education session focuses on important dietary guidelines and healthy eating habits regarding ASF intake (such as protein, iron, vitamin B12, and other essential nutrients) for under-five children.

Data Collection

In this study, data collection was conducted using an instrument designed by the researcher consisting of 20 questions item to assess changes in participants' behaviour related to animal source food (ASF) nutrition intake. A structured questionnaire using a Likert scale was developed to measure various dimensions of self-reported nutritional practices among parents with under-five children. All participants completed the questionnaire before the intervention (pre-test) and after the intervention (post-test). This approach facilitated quantitative data analysis, allowing us to evaluate the effectiveness of the intervention by comparing pre- and post-intervention scores to identify significant changes in parent behaviour regarding ASF intake in under-five children.

Data Analysis

Quantitative data obtained from the questionnaires

were analysed using descriptive statistics to describe the distribution frequency of respondents' profiles (age, occupation, education, number of biological children, and family income). In addition, parametric analysis will also be used to measure changes in parents' behaviour before and after the nutritional education intervention was given. The paired sample t-test was used to evaluate significant differences between parents' behaviour before and after nutrition education. This test was chosen because the data obtained were numerical, and the study was conducted on a single group of respondents. Since the data followed a normal distribution, a paired sample t-test was performed to assess behavior changes before and after the intervention.

Ethical Clearance

This research has obtained research ethics permission from The Research Ethics Committee of Faculty Medicine Universitas Sebelas Maret with letter number 192/UN27.06.11/KEP/EC/2024. Researchers ensure that all participants understand the information related to the research and are willing to participate in the research as indicated by a written consent form.

RESULT

Respondent Demographics

Characteristics of the respondent in this study are based on several individual aspect (age, occupation, education, number of biological children, and family income). A total of 150 respondent are participated in the intervention and completed the behavioural assessment related to ASF intake. Most of the respondents are between 25-35 years old (33.3%) and have a senior high school education (50.0%). Respondents are spread across a range of economic statuses, with the majority worked as housewife and had lower family income (48.7%) (See Table I).

Table I : Socio-demography of Respondents (N=150)

Characteristics	Total of Respondents	
	N	%
Age of The Respondent		
<25 years old	30	20.0
25-35 years old	50	33.3
35-45 years old	40	26.7
>45 years old	30	20.0
Occupation		
Housewife	73	48.7
Civil Servant	4	2.7
Self-employed	7	4.7
Teacher	8	5.3
Farmer	24	16.0
Merchant	28	18.7
Healthcare workers	6	4.0
Marital Status		
Married	139	92.7
Divorced	11	7.3
Economic Status (Family income)		
< Regional minimum wage*	125	83.3
> Regional minimum wage*	25	16.7
Educational Status		
Elementary School	9	6.0
Junior High School	32	21.3
Senior High School	75	50.0
Diploma	19	12.7
Bachelor	15	10.0
Number of Biological Children		
1	44	29.3
2	30	20.0
3	32	21.3
4	44	29.3
Age of The Child		
<25 month	73	48.7
25-35 month	19	12.7
35-45 month	24	16.0
45-59 month	34	22.7
Child Gender		
Male	77	51.3
Female	73	48.7

*Regional Minimum Wage of Ciamis Regency is Rp2.021.657

Behaviour Changes

In this study, behavior is grouped into three categories, namely good, fair, and poor behavior as shown in Table II. Before the intervention the average score was (Mean (SD)=1.23+0.57) and after the intervention (Mean (SD)=1.94+0.88). There was a two-fold increase in the number of participants who had good behaviour (84.0%) regarding ASF intake after the nutritional education session was conducted (See Table II). The results also suggest that digital media is significantly improving parents' behaviour regarding ASF intake in under-five children (p=0.000) after the intervention was given.

Table II: Comparison in Behaviour Before and After Intervention (N=150)

Category	Comparison of Behavior				Paired t-test (p value)
	Pre-test	%	Post-test	%	
Good	63	42.0	126	84.0	0.000
Fair	33	22.0	13	8.7	
Poor	11	36.0	11	7.3	

DISCUSSION

Poor feeding practices, low dietary diversity, and low intake of animal source foods (ASF) have been reported as key determinant contributing to child stunting and a barrier to stunting prevention programs (13,14,29). Parental knowledge and awareness on child feeding play an important role in supporting good feeding practice (30). According to previous study, improving parent health literacy through structured health education programs is related to healthier eating habits and affects the overall nutritional status of children (31). However, a study conducted by Ainy et al. (2021) highlighted that mothers faced challenges due to limited access to information about healthy feeding practices (32). The use of digital media in delivering nutritional education is a promising solution due to its ability to widely deliver information in creative way (24). Given the limited research on the use of digital media in nutritional education related to ASF intake, this study aims to investigate the effect of nutritional education through digital media on parent behaviour regarding ASF intake in under five children.

This study shows that nutritional education through digital media has been proven as an effective strategy to improve parent knowledge and behaviour on ASF feeding. This is in line with previous research showing that digital media can be a powerful tool to increase mothers' knowledge regarding nutritional practices for their infants (33). According to the Health Belief Model that emphasizes the role of perceived susceptibility and severity in motivating behavioural changes, mothers are more likely to adopt healthier feeding practices when they understand the risks associated with inadequate nutrition (34). Supported by another study, structured health education may lead mothers to have significant improvement in knowledge and behaviours related

to nutrition, as evidenced by increased consumption of diverse and healthy foods for their children (35). Moreover, the better the parental knowledge, the greater the quantity and quality of food provided to toddlers, ensuring that children nutritional intake is adequately met (36). However, short-term interventions are not sufficient to improve the nutritional status of children experiencing stunting (37). Continuing health promotion by providing nutrition training and support are needed to create sustainable framework in reducing stunting rates (38). In this context, the use of digital media is very important to facilitate health promotion and education programs.

Compared to conventional health education which has the advantage of fostering personal relationships and direct support, the use of digital media may offer greater accessibility, interactivity, and personalization in cost-effective manner (39). These advantages may help to overcome the issues related to resource constraints that limit the availability of educational materials and trained personnel, which are common in low- and middle-income countries (LMIC) (35). Integrating digital media into health education program may significantly increase the reach and effectiveness of promoting healthy behaviours among diverse populations (40). Digital media can be an effective tool to engage communities in the planning and implementation of health promotion and education, which can also support the sustainability of these programs (41). According to several study which discusses the application of digital media in nutritional education program, the use of digital media can be effective in improving nutrition-related outcomes both for parents and their children (42,43). Therefore, digital media can be an alternative solution used to increase the scope of information delivery and overcome problems related to distance and resource constraints.

Although digital media offers a promising solution in optimizing health education and promotion programs to reduce stunting, there are several aspects are need to be considered. Study conducted by Labrique et al. (2018) emphasize several critical factors to consider in implementing digital media for health education program including community engagement, user interface design, integration into existing health system, ongoing training and support, and robust monitoring and evaluation (44). In this case, it is important to ensure that recipients of health education also have adequate digital literacy skills to ensure that they could receive health information properly (45). Effective information retention through intuitive interface design can boost user engagement, which is vital for the sustainability of community-based health education programs (41). Consequently, digital media should not be viewed as a standalone solution to existing problems; rather, it should be utilized to enhance the effectiveness of health promotion and education initiatives. Additionally, public health policies should integrate digital media strategies into existing nutrition programs targeting

1 parents (46). This is also include creating user-friendly mobile applications that provide personalized nutrition information, utilizing social media for community engagement and peer support, and establishing regular monitoring and feedback systems to evaluate the effectiveness of these interventions (25).

The role of digital media in improving parents understanding of nutritional intake for children under five carries important implications for public health policies focused on reducing malnutrition and stunting. This approach not only provides immediate access to essential nutritional information but also promotes ongoing engagement through interactive content and community support (47).

CONCLUSION

Nutritional education through digital media is proven to be effective in improving parents' behaviour related to fulfilling ASF intake in children under five. This study shows that digital media can be a powerful tool to deliver relevant nutrition information and encourage positive behaviour change. The results of this study were supported by statistical analysis that showed significant differences in parents' behaviour before and after the nutritional education intervention. Continuing nutrition promotion programs integrated with the use of digital media is necessary to provide personalized information on nutrition and engage the community in stunting prevention program. The future development of education programs should address several challenges, including limited access to digital media and differences in digital literacy. Further research is needed to explore the impact of digital media on other aspects of nutritional behavior and how these strategies can be integrated into broader public health programs.

ACKNOWLEDGEMENTS

This study has several limitations in its research methodology. As a result, the generalizability of the findings is limited due to its single-center design, inadequate sample size, and use of a purposive sampling technique. In this study, randomization of participants was not performed and the intervention was not assigned to two different groups such as intervention and control groups. Thus, it is difficult to establish causality between the intervention and the observed effects with certainty due to the presence of confounding factors that are not adequately measured. Moreover, our evaluation was limited to the cognitive aspects of respondents through pre- and post-tests. The author would like to express their utmost gratitude to the Faculty of Medicine, Sebelas Maret State University, which has facilitated and supervised the process of study to completion.

REFERENCES

1. Birhanu F, Yitbarek K, Bobo FT, Atlantis E, Woldie M. Undernutrition in children under five associated with wealth-related inequality in 24 low- and middle-income countries from 2017 to 2022. *Sci Rep.* 2024 Feb;14(1):3326. doi:10.1038/s41598-024-53280-0
2. World Health Organization. Stunting, wasting, overweight and underweight [Internet]. 2023. Available from: <https://www.who.int/data/nutrition/nlis/info/malnutrition-in-children>
3. Wakefield J, Godwin J, Li ZR, Meisner J, Okonek T, Paige J, et al. Subnational Under-five Mortality Estimates , 1990 – 2019. 2021;1990–2019. Available from: <https://data.unicef.org/resources/subnational-under-five-mortality-estimates-1990-2021/>
4. Katoch OR. Determinants of malnutrition among children: A systematic review. *Nutrition.* 2022 Apr; doi:10.1016/j.nut.2021.111565
5. Ahmad D, Afzal M, Imtiaz A. Effect of socioeconomic factors on malnutrition among children in Pakistan. *Futur Bus J.* 2020;6(1):1–11. doi:10.1186/s43093-020-00032-x
6. Kementerian Kesehatan RI. Survey Kesehatan Indonesia (SKI) [Internet]. 2023. Available from: <https://www.badankebijakan.kemkes.go.id/ski-2023-dalam-angka/>
7. World Health Organization (WHO). Stunting prevalence in children aged < 5 years (%) (Health Inequality Monitor) [Internet]. 2024 [cited 2024 Oct 14]. Available from: <https://www.who.int/data/gho/indicator-metadata-registry/imr-details/3328#:~:text=The percentage of stunting %28defined as more than,Standards%29 among children under five years of age.>
8. Marliany H, Apipudin A, Ramdani AS. Factors Associated With Nutritional Status in Toddler. *J Kesehat STIKes Muhammadiyah Ciamis.* 2022;9(2):45–55. doi:10.52221/jurkes.v9i2.339
9. Wulandary W, Sudiarti T. Nutrition intake and stunting of under-five children in Bogor West Java, Indonesia. *J Food Sci Nutr.* 2021;7(104):2. doi:10.24966/FSN-1076/100104
10. Anggraeni LD, Toby YR, Rasmada S. Analysis of Nutrient Intake on Nutritional Status of Under Five Year Children. *Faletehan Heal J.* 2022;8(02):92–101. doi:10.33746/fhj.v8i02.191
11. Rizkika M, Ruwiah R, Fithria F. Factors Related to Stunting Incidence in Toddlers in the Working Area of the Waborobo Health Center, Betoambari District, Baubau City in 2023. *J Soc Res.* 2023;2(9):3031–43. doi:10.55324/josr.v2i9.1363
12. Ashari R, Basyir V, Afriwardi A, Mayetti M, Yusrawati Y, Desmawati D. Factors Related to Stunting Incidence in Toddlers Aged 24-59 Months in the Working Area of Kambang Community Health Center, Pesisir Selatan District. *Contag Sci Period J Public Heal Coast Heal.* 2023;5(2):530. doi:10.30829/contagion.v5i2.15097

13. Beal T, Tumilowicz A, Sutrisna A, Izwardy D, Neufeld LM. A review of child stunting determinants in Indonesia. *Matern Child Nutr.* 2018;14(4):e12617. doi:10.1111/mcn.12617
14. Haryani VM, Putriana D, Hidayati RW. Animal-Based Protein Intake is Associated with Stunting in Children in Primary Health Care of Minggir. *Amerta Nutr.* 2023;7. doi:10.20473/amnt.v7i2SP.2023.139-146
15. Daba AK, Murimi M, Abegaz K, Hailu D. Animal source food consumption practice and factors associated among infant and young children from selected rural districts in Ethiopia: A cross-sectional study. *PLoS One.* 2024;19(7):e0306648. doi:10.1371/journal.pone.0306648
16. Fite MB, Tura AK, Yadeta TA, Oljira L, Roba KT. Consumption of animal source food and associated factors among pregnant women in eastern Ethiopia: A community-based study. *PLoS One.* 2022;17(6):e0270250. doi:10.1371/journal.pone.0270250
17. Hamza HA, Oumer A, Kabthymmer RH, Ali Y, Ahmed Mohammed A, Shaka MF, et al. Individual and community-level factors associated with animal source food consumption among children aged 6-23 months in Ethiopia: Multilevel mixed effects logistic regression model. *PLoS One.* 2022;17(4):e0265899. doi:10.1371/journal.pone.0265899
18. Pavithra G, Kumar SG, Roy G. Effectiveness of a community-based intervention on nutrition education of mothers of malnourished children in a rural coastal area of South India. *Indian J Public Health.* 2019;63(1):4–9. doi:10.4103/ijph.IJPH_383_17
19. Majamanda J, Maureen D, Munkhondia TM, Carrier J. The effectiveness of community-based nutrition education on the nutrition status of under-five children in developing countries. A systematic review. *Malawi Med J [Internet].* 2014;26(4):115–8. Available from: <https://pubmed.ncbi.nlm.nih.gov/26167260/>
20. Kueppers J, Stein KF, Groth S, Fernandez ID. Maternal and child dietary intake: The role of maternal healthy-eater self-schema. *Appetite.* 2018 Jun;125:527–36. doi:10.1016/j.appet.2018.01.014
21. Fatima S, Manzoor I, Joya AM, Arif S, Qayyum S. Stunting and associated factors in children of less than five years: A hospital-based study. *Pakistan J Med Sci.* 2020;36(3):581–5. doi:10.12669/pjms.36.3.1370
22. Fitriyani P, Mulyono S, Handayani TW. The Importance of Nutrition Education to Change Mother's Knowledge and Behaviour in Achieving Adequate Nutrition for Toddler. In: *Proceedings of the International Conference on Nursing and Health Sciences.* 2024. p. 127–34. doi:10.37287/picnhs.v5i1.2848
23. Yanti S, Hartati S, Eliza. Education About the Provision of Supplementary Feeding to Toddler Mothers. *J Appl Nurs Heal.* 2023;5(1):16–24. doi:10.55018/janh.v5i1.122
24. Morales-Cahuancama B, Verdezoto N, Gonzales-Achuy E, Quispe-Gala C, Bautista-Olortegui W, Hinojosa-Mamani P, et al. Exploring Children's Knowledge of Healthy Eating, Digital Media Use, and Caregivers' Perspectives to Inform Design and Contextual Considerations for Game-Based Interventions in Schools for Low-Income Families in Lima, Peru: Survey Study. *JMIR Form Res.* 2024;8(1):e49168. doi:10.2196/49168
25. Dallagiacomma G, Alberti F, Odone A. The efficacy of digital media tools to promote a healthy diet in children: A systematic review of intervention studies. *Acta Bio-medica Atenei Parm.* 2023;94(S3):e2023157–e2023157. doi:10.23750/abm.v94iS3.14293
26. Assabila SY, Sefrina LR. Kajian pustaka: penggunaan media digital sebagai alternatif media pendidikan gizi pada remaja di masa pandemi COVID-19. *Poltekita J Ilmu Kesehat.* 2022;16(1):118–25. doi:10.33860/jik.v16i1.693
27. Mey D, Ridayani R, San N, Kristianto J, Muslim M. Penggunaan Media Edukasi Gizi Aplikasi Electronic Diary Food (Edifo) Dan Metode Penyuluhan Serta Pengaruhnya Terhadap Pengetahuan Ibu Hamil. *Qual J Kesehat.* 2020;14(1):1–10. doi:10.36082/qjk.v14i1.93
28. Sahputra RR, Kurniawan R. Klasterisasi Data Balita Stunting di Kecamatan Wilayah Kabupaten Ciamis Berdasarkan Prevalensi Dengan Menggunakan Algoritma K-Means. *JATI (Jurnal Mhs Tek Inform.* 2024;8(2):2451–61. doi:10.35134/komtekinfo.v10i3.423
29. Sukanto IS, Hartono RS, Mulyani S. Community health center worker perspectives on stunting risk factors and challenge of stunting prevention program: A qualitative study. *Community Health (Bristol) [Internet].* 2021;44(05). Available from: <https://www.teikyomedicaljournal.com/public/volume/TMJ/44/05/community-health-center-worker-perspectives-on-stunting-risk-factors-and-challenge-of-stunting-prevention-program-a-qualitative-study-616bfe2cb81de.pdf>
30. De Rosso S, Ducrot P, Chabanet C, Nicklaus S, Schwartz C. Increasing parental knowledge about child feeding: evaluation of the effect of public health policy communication media in France. *Front Public Heal.* 2022;10:782620. doi:10.3389/fpubh.2022.782620
31. Velardo S, Drummond M. Understanding parental health literacy and food related parenting practices. *Heal Sociol Rev.* 2013;22(2):137–50. doi:10.5172/hesr.2013.22.2.137
32. Ainy A, Febry F, Safriantini D. Potential Barriers in Implementing Local-Food-Based Complementary Feeding Practice. *J Ilmu Kesehat Masy.* 2021;12(2):117–27. doi:10.26553/

- jikm.2021.12.2.117-127
33. Seyyedi N, Rahmatnezhad L, Mesgarzadeh M, Khalkhali H, Seyyedi N, Rahimi B. Effectiveness of a smartphone-based educational intervention to improve breastfeeding. *Int Breastfeed J*. 2021;16:1–8. doi:10.1186/s13006-021-00417-w
 34. Meysenburg R, Albrecht JA, Litchfield R, Ritter-Gooder PK. Food safety knowledge, practices and beliefs of primary food preparers in families with young children. A mixed methods study. *Appetite* [Internet]. 2014;73:121–31. Available from: <https://www.sciencedirect.com/science/article/pii/S019566631300425X> doi:<https://doi.org/10.1016/j.appet.2013.10.015>
 35. Pierre G, Dzinamarira T. A scoping review on barriers to implementation of health education programs in low to middle income countries. *Int J Community Med Public Heal*. 2019;6(8):3651. doi:10.18203/2394-6040.ijcmph20193503
 36. Noviana U, Ekawati H, Hasinuddin M, Haris M, Mufarika M. Stunting prevention behavior among children under two years based on integrated behavior: A model development. 2024; doi:10.20473/pmnj.v10i1.47366
 37. Bidira K, Tamiru D, Belachew T. Effect of nutritional education on anthropometric deficits among pre-school aged children in south West Ethiopia: quasi-experimental study. *Ital J Pediatr*. 2022;48(1):8. doi:10.1186/s13052-022-01201-0
 38. Shekar M, Kakietek J, D'Alimonte MR, Rogers HE, Eberwein JD, Akuoku JK, et al. Reaching the global target to reduce stunting: an investment framework. *Health Policy Plan*. 2017;32(5):657–68. doi:10.1093/heapol/czw184
 39. Stellefson M, Paige SR, Chaney BH, Chaney JD. Evolving role of social media in health promotion: updated responsibilities for health education specialists. *Int J Environ Res Public Health*. 2020;17(4):1153. doi:10.3390/ijerph17041153 Full text linksCite
 40. Korda H, Itani Z. Harnessing social media for health promotion and behavior change. *Health Promot Pract*. 2013;14(1):15–23. doi:10.1177/1524839911405850
 41. Sultan MI, Amir AS. The Utilization of Digital Media in Health Communication in Indonesia. *JRK (Jurnal Ris Komunikasi)* [Internet]. 2023;14(2):215–33. Available from: <https://jurnal.untirta.ac.id/index.php/JRKom/article/view/22079/0>
 42. Zarnowiecki D, Mauch CE, Middleton G, Matwiejczyk L, Watson WL, Dibbs J, et al. A systematic evaluation of digital nutrition promotion websites and apps for supporting parents to influence children's nutrition. *Int J Behav Nutr Phys Act*. 2020;17:1–19. doi:10.1186/s12966-020-0915-1
 43. Au LE, Whaley S, Rosen NJ, Meza M, Ritchie LD. Online and in-person nutrition education improves breakfast knowledge, attitudes, and behaviors: a randomized trial of participants in the special supplemental nutrition program for women, infants, and children. *J Acad Nutr Diet*. 2016;116(3):490–500. doi:10.1016/j.jand.2015.10.012
 44. Labrique AB, Wadhvani C, Williams KA, Lamptey P, Hesp C, Luk R, et al. Best practices in scaling digital health in low and middle income countries. *Global Health*. 2018;14:1–8. doi:10.1186/s12992-018-0424-z
 45. Brach C, Keller D, Hernandez LM, Baur C, Parker R, Dreyer B, et al. Ten attributes of health literate health care organizations. *NAM Perspect* [Internet]. 2012; Available from: <https://www.coe.int/en/web/bioethics/-/united-states-ten-attributes-of-health-literate-health-care-organizations>
 46. Barker M, Dombrowski SU, Colbourn T, Fall CHD, Kriznik NM, Lawrence WT, et al. Intervention strategies to improve nutrition and health behaviours before conception. *Lancet* [Internet]. 2018;391(10132):1853–64. Available from: [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(18\)30313-1/abstract](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(18)30313-1/abstract)
 47. Banna JC, Lin MFG, Stewart M, Fialkowski MK. Interaction matters: Strategies to promote engaged learning in an online introductory nutrition course. 2015; Available from: <https://pubmed.ncbi.nlm.nih.gov/27441032/>