



The Effectiveness of Audio-visual Media in Increasing Mother's Knowledge About Preventing Dehydration of Under-Five Children with Diarrhea

Mariyam Mariyam^{1,*} Rima Salwa Islamia² Yuni Sufyanti Arief³ Ilya Krisnana⁴ Erna Sulistyawati⁵

^{1,2,3,5} Universitas Muhammadiyah Semarang, Semarang, Central Java 50273, Indonesia

^{1,4} Universitas Airlangga, Surabaya, East Java 60132, Indonesia

mariyam@unimus.ac.id

Abstract. Dehydration is the main cause of death in under-five children with diarrhea. Mothers have an important role in preventing dehydration in under-five children with diarrhea. Mothers' knowledge about preventing dehydration of diarrhea is very much needed. The aim of this research was to determine the effectiveness of audiovisual media on mothers' knowledge about preventing dehydration in under-five children with diarrhea. This research is a quasi-experimental design, one group pretest posttest without a control group. The sample was 85 respondents from mothers who had children under 5 years old at Posyandu Budi Lestari 1 Sidokerto Pati. Mother's knowledge was measured using a questionnaire regarding preventing dehydration in under-five children with diarrhea. The intervention provided is in the form of providing health education through audiovisual media. Data were analyzed using the Wilcoxon non-parametric test. The research results showed that before the intervention, the average level of knowledge was 7.40 ± 1.093 and after the intervention the average level of knowledge was 12.67 ± 0.662 . The results of the analysis show that there is an influence of audiovisual media on mothers' knowledge about preventing dehydration in under-five children with diarrhea (p value < 0.05). Health education for mothers is expected to be provided periodically to increase knowledge and enable mothers to care for children under five years old.

Keywords: Audiovisual Media, Mother's Knowledge, Handling Dehydration, Diarrhea.

1. Introduction

Defecating three or more times in a 24-hour period with a consistency similar to liquid feces is known as diarrhea [1]. Sudden electrolyte loss brought on by diarrhea can lead to dehydration, damage to organs, and even a loss of consciousness. One of the main causes of diarrhea mortality, particularly in children under five, is dehydration brought on by the

illness [2]. When a child under 5 years has diarrhea, the mother does not utilize oral rehydration solution (ORS) [3], does not recognize the symptoms of dehydration [4], and instead provides the child sweet tea, fruit, beverages, or coffee [5]. There is still a paucity of awareness among mothers about how to address dehydration in children

Diarrhea is the second cause of death in children under 5 years worldwide. A total of 1.7 billion cases of children under-five years diarrhea and 370 deaths with diarrhea in 2019 [6]. The prevalence of diarrhea in Indonesia in all age groups shows 8%, toddlers 12.3% and babies 10% [7]. In Central Java, there were 87,510 cases of children under-five years diarrhea in 2021 [8]. Mothers' knowledge of diarrhea in Ethiopia showed that 58.6% did not know the signs of dehydration [9]. In the working area of the Tlogosari Kulon Community Health Center, 45.3% showed sufficient knowledge regarding diarrhea and 24.3% showed insufficient knowledge [10]. Factors that influence the incidence of diarrhea in children are the mother's age, the mother's educational status, the child's poor nutrition and the mother's knowledge. Children under five with mothers aged 43 years and over have a 3.72 times greater risk of experiencing diarrhea. Mothers with higher education can understand the importance of children's health. Children whose mothers have knowledge about diarrhea are 51% less likely to get diarrhea [11].

The main treatment for diarrhea is rehydration. During periods of diarrhea, rehydration using oral rehydration solution (ORS) is important to prevent dehydration. Mothers need to know about preventing dehydration in children with diarrhea by rehydrating. Maternal knowledge about rehydration to prevent dehydration is influenced by the mother's education level, employment status and gender [12]. Maternal knowledge is important in managing diarrhea in children. Most mothers know the components of ORS which they make at home but do not know how to make it and do not know the function of ORS [13]. Mothers should at least know about recognizing signs and symptoms of dehydration and the amount and type of fluids [4]. Increasing maternal knowledge is very necessary so that mothers are able to understand how to treat diarrhea to prevent dehydration. Management of most cases of acute diarrhea can be carried out at home by providing proper education to mothers about preventing dehydration in children with diarrhea. Health education about oral rehydration therapy including providing maintenance fluids [14].

Providing health education requires appropriate media to increase a person's understanding. The media that is considered appropriate for conveying information is audiovisual media. Audiovisual media can channel knowledge more optimally because it provides a more real and interesting picture, easier to remember compared to other media (Lestari et al., 2018). Health education using audiovisual has the advantage of being able to provide good visualization, thereby facilitating the process of absorbing knowledge, being able to produce better learning outcomes for tasks such as remembering, re-recognizing and connecting facts and concepts (Susanti et al., 2020). Mothers who received health education using audiovisual media experienced an increase in the knowledge and attitudes of mothers of toddlers regarding diarrhea management (Musdalifah et al., 2021). The aim of this

research was to analyze the effect of health education using audiovisual media on mothers' knowledge about preventing dehydration in under-five children with diarrhea.

2. Method

This study employs a quasi-experimental design, utilizing a one-group pretest-posttest method. It evaluates mothers' understanding of preventing dehydration in toddlers with diarrhea before and after receiving health education through audiovisual media.

The study involved 85 mothers with children under five at Posyandu Budi Lestari in Sidokerto village from March to August 2023. A questionnaire with 14 Guttman scale questions assessed knowledge of preventing dehydration in toddlers with diarrhea. The questionnaire demonstrated validity with person correlation > 0.30 and reliability with a Cronbach's alpha of 0.067. Health education utilized a researcher-made 4.49-minute audiovisual video, approved by village and Posyandu heads. Informed consent was obtained from all participants. Health education sessions were conducted at the Posyandu center using an LCD for video playback, with time allocated for clarifications. A post-test questionnaire was administered a week after the education session. Two enumerators assisted the researchers throughout the process. The study adheres to research ethics by anonymizing respondents in result presentation. It obtained approval from the Health Research Ethics Commission of the Faculty of Nursing and Health Sciences, Muhammadiyah University, Semarang (No. 142/KE/07/2023). Data were univariately analyzed for knowledge and respondent characteristics. Bivariate analysis, utilizing the Wilcoxon test due to non-normal data distribution, assessed the impact of health education on maternal knowledge.

3. Results and Discussion

In this study, respondents had an average age of 28.52 years, ranging from 22 to 37 years. The majority had a high school education (82.4%), while a smaller percentage had education levels of junior high school (4.7%) and college (12.9%). Regarding employment status, 51.8% were employed, while 48.2% were not.

Table 1. Effect of health education through audiovisual media on mother's knowledge (n=85)

Knowledge	Mean	SD	Min	Max	P value
Before	7.40	1.093	5	9	0.00
After	12.67	0.662	12	14	

The findings revealed that the average age of respondents was 28 years. These results align with previous research indicating that the average age of mothers with children experiencing diarrhea is typically around 30 years [15]. As individuals age, their maturity, strength in thinking, and work capabilities tend to increase. Age also plays a role in shaping a person's understanding and cognitive abilities, with older individuals typically developing more

sophisticated thinking patterns and acquiring greater knowledge over time. This progression in age directly influences mothers' knowledge regarding the management of diarrhea in children [9]. Additionally, the age range of 25-35 years is associated with minimal health risks for mothers, as individuals within this age group typically possess reproductive maturity as well as emotional and social stability [16].

The majority of respondents in this study had a high school education. Education significantly influences knowledge levels by facilitating the comprehension and retention of information. Mothers with toddlers, primarily falling into the basic education category, tend to exhibit poorer diarrhea management skills. Conversely, mothers with higher education levels demonstrate better knowledge levels, primarily at the secondary education level. This discrepancy arises from the fact that higher levels of education enable mothers to better grasp information, thereby enhancing their ability to prevent and manage diarrhea effectively [17].

The majority of respondents in this study are employed, and it's recognized that one's occupation significantly impacts their knowledge and experience. This influence stems from the unique characteristics and working conditions inherent to each job [18]. Housewives, despite not frequently leaving the house, have opportunities for interaction through social media or mass media, potentially leading to comprehensive knowledge. Conversely, although working mothers may have more outings, their interactions may not always contribute to enhanced knowledge, possibly resulting in similar knowledge levels to housewives [19].

Before receiving health education, mothers predominantly exhibited poor knowledge, with a mean score of 7.40. Following the health education intervention, their knowledge significantly improved, with a mean score of 12.67 indicating mostly good knowledge. This disparity underscores the effectiveness of the health education intervention. Furthermore, children whose mothers possess a higher level of knowledge are less likely to develop diarrhea, highlighting the importance of maternal education in preventing childhood illnesses [20]. Information acquisition shapes individual values, knowledge, and subsequent behaviors. Health education serves as a vital source of information, accessible through diverse mediums such as print media (posters, leaflets, brochures) and electronic media (TV, radio, cassettes, slides). Health workers commonly utilize leaflets and LCD PowerPoint slides for health education, facilitating effective dissemination of crucial information [21].

The utilization of audiovisual media in health education led to a significant increase in respondents' knowledge, suggesting that such media facilitate the assimilation of new information for mothers. Health education relies on various media, including videos and posters. Video media, as an audiovisual tool, engages both sight and hearing senses, enhancing learning effectiveness. The use of media in health education captures individuals' interest, fostering confidence and expediting cognitive, affective, and psychomotor changes [22].

Utilizing multimedia that engages multiple senses enhances comprehension, making audiovisual media, particularly videos, invaluable in clarifying and simplifying information. Videos, incorporating sight and hearing, facilitate learning processes by rendering content

more accessible. This medium is perceived as highly effective and engaging for recipients, optimizing the attainment of health education objectives. These findings align with prior research affirming the effectiveness of mobile video applications in enhancing mothers' knowledge and attitudes toward reducing the duration of toddler diarrhea [23].

Authors' Contributions

All authors actively contributed to the development and completion of this research. MM conceptualized the research design, conducted literature reviews, and played a crucial role in data analysis and interpretation. RSI contributed to the data collection process, statistical analysis, and interpretation of findings. YSA and IK played a significant role in drafting and revising the manuscript, ensuring its coherence and intellectual content. ES contributing valuable insights throughout the research process.

Acknowledgment

Researchers would like to thank Universitas Muhammadiyah Semarang for supporting this research.

References

1. Beser OF, Cullu Cokugras F, Dogan G, Akgun O, Elevli M, Yilmazbas P, et al. The frequency of and factors affecting functional gastrointestinal disorders in infants that presented to tertiary care hospitals. *European Journal of Pediatrics* 2021;180:2443–52. <https://doi.org/10.1007/s00431-021-04059-2>.
2. Hockenberry MJ, Wilson D, Rodgers CC. *Wong's Essentials of Pediatric Nursing*. Elsevier; 2016.
3. Alghadeer S, Syed W, Alhossan A, Alrabiah Z, Babelghaith SD, Al Arifi MN, et al. Assessment of Saudi mother's knowledge and attitudes towards childhood diarrhea and its management. *International Journal of Environmental Research and Public Health* 2021;18. <https://doi.org/10.3390/ijerph18083982>.
4. Terefe G, Murugan R, Bedada T, Bacha G, Bekele G. Home-based management practice of diarrhea in under 5 years old children and associated factors among caregivers in Ginchi town, Oromia region, west Ethiopia. *SAGE Open Medicine* 2022;10. <https://doi.org/10.1177/20503121221095727>.
5. Ndayisaba A, Uwizeyimana A, Tuyisenge MJ, Chironda G. Knowledge and practices of mothers on home management of diarrhoea in under-fives children at selected primary health care Centre, Rwanda: A descriptive cross-sectional study. *International Journal of Africa Nursing Sciences* 2022;17:100508. <https://doi.org/10.1016/j.ijans.2022.100508>.

6. Thiam S, Sy I, Schindler C, Niang-Diène A, Faye O, Utzinger J, et al. Knowledge and practices of mothers and caregivers on diarrhoeal management among under 5-year-old children in a medium-size town of Senegal. *Acta Tropica* 2019;194:155–64. <https://doi.org/10.1016/J.ACTATROPICA.2019.03.013>.
7. Badan Penelitian dan Pengembangan Kesehatan Kementerian Kesehatan Republik Indonesia. Riset Kesehatan Dasar Nasional. Kementerian Kesehatan RI 2018:126.
8. Kemenkes RI. Profil Kesehatan Indonesia 2021. 2022.
9. Shewangizaw B, Mekonen M, Feku T, Hoyiso D, Borie YA, Yeheyis T, et al. Knowledge and attitude on home-based management of diarrheal disease among mothers/caregivers of under-five children at a tertiary hospital in Ethiopia. *Pan African Medical Journal* 2023;44. <https://doi.org/10.11604/pamj.2023.44.38.34431>.
10. Kambu YK, Azinar M. Perilaku Pencegahan Diare Pada Balita. *Indonesian Journal of Public Health and Nutrition* 2021;1:101–13.
11. Andualem Z, Dagne H, Taddese AA, Dagne B. <p>Mothers' Handwashing Knowledge as a Predictor of Diarrheal Disease Among Under-Five Children Visiting Pediatric Ward in University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia, 2019</p>. *Pediatric Health, Medicine and Therapeutics* 2019;Volume 10:189–94. <https://doi.org/10.2147/phmt.s233337>.
12. Yimenu DK, Kasahun AE, Chane M, Getachew Y, Manaye B, Kifle ZD. Assessment of knowledge, attitude, and practice of child caregivers towards oral rehydration salt and zinc for the treatment of diarrhea in under 5 children in Gondar town. *Clinical Epidemiology and Global Health* 2022;14:100998. <https://doi.org/10.1016/j.cegh.2022.100998>.
13. Ndayisaba A, Uwizeyimana A, Tuyisenge MJ, Chironda G. Knowledge and practices of mothers on home management of diarrhoea in under-fives children at selected primary health care Centre, Rwanda: A descriptive cross-sectional study. *International Journal of Africa Nursing Sciences* 2022;17:100508. <https://doi.org/10.1016/j.ijans.2022.100508>.
14. Sussanne FrennertOstlundB. Narrative review. *Nordic Journal* 2018;06:267–9. <https://doi.org/10.1353/sym.2003.0023>.
15. Nankali H, Cheraghi F, Tehrani TH, Mohammadi Y, Azadimoghtader M. Mothers participation in caring for hospitalized children with acute gastroenteritis: A quasi□ experimental study. *Nursing Open* 2023. <https://doi.org/10.1002/nop2.1889>.
16. Musdalifah M, Oka IA, Marwanty M. Efektivitas Promosi Kesehatan Terhadap Pengetahuan Dan Sikap Tatalaksana Diare Pada Balita Di Kota Palopo. *PREPOTIF : Jurnal Kesehatan Masyarakat* 2020;5:20–34. <https://doi.org/10.31004/prepotif.v5i1.1281>.
17. Jabeen S, Saha UR, van Wesenbeeck CFA, Mushtaq K. An overview of diarrhea among infants and under-five in Punjab-Pakistan. *Journal of Pediatric Nursing* 2023;71:e28–37. <https://doi.org/10.1016/j.pedn.2023.04.011>.
18. Suryapramita Dusak MR, Sukmayani Y, Apriliana Hardika S, Ariastuti LP. Gambaran pengetahuan, sikap, dan praktik ibu balita terhadap penatalaksanaan diare pada anak

- balita di wilayah kerja Puskesmas Abang 1. *Intisari Sains Medis* 2018;9:85–94. <https://doi.org/10.15562/ism.v9i2.168>.
19. Purwoko M. Hubungan Tingkat Pendidikan dan Pekerjaan dengan Tingkat Pengetahuan Mengenai Kanker Ovarium pada Wanita. *Mutiara Medika: Jurnal Kedokteran Dan Kesehatan* 2018;18. <https://doi.org/10.18196/mm.180214>.
 20. Astutik E, Efendi F, Sebayang SK, Hadisuyatmana S, Has EMM, Kuswanto H. Association between women's empowerment and diarrhea in children under two years in Indonesia. *Children and Youth Services Review* 2020;113:105004. <https://doi.org/10.1016/j.chilyouth.2020.105004>.
 21. Xu M, Wang Y, Wang HC. Adjuvant concomitant treatment with traditional Chinese medicines in patients receiving chemotherapy for HER2-Positive breast cancer: A pilot randomized controlled trial. *Complementary Therapies in Clinical Practice* 2021;43:101373. <https://doi.org/10.1016/j.ctcp.2021.101373>.
 22. Ichwan EY. Increasing Adolescents' Knowledge of Family Preparation Through the Use of Audio-Visual Media. *International Journal of Science and Society* 2023;5:26–34. <https://doi.org/10.54783/ijsoc.v5i3.712>.
 23. Lestari Y, Nurhaeni N, Hayati H. Penerapan Mobile Video Efektif Meningkatkan Pengetahuan Dan Sikap Ibu Dalam Menurunkan Lama Diare Balita Di Wilayah Puskesmas Kedaton Bandar Lampung. *Jurnal Keperawatan Indonesia* 2018;21:34–42. <https://doi.org/10.7454/jki.v21i1.546>.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

