

The Influence of Health Promotion on the Incidence of Measles in Children: A Systematic Review

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Abstract. *Measles, an infectious disease, remains a serious health problem throughout Indonesia. The government has provided an effective and affordable vaccine, but immunization coverage remains low, contributing to the increase and high number of measles cases in Indonesia. One contributing factor is maternal knowledge about immunization and other contributing factors. Health promotion is an effort to improve maternal knowledge. This systematic review aims to find evidence based on published articles related to health promotion and the factors contributing to measles incidence. The criteria for this study were original articles and respondents located in Indonesia, with articles published between 2020 and 2025. The review method used was PRISMA, obtained from databases such as PubMed, Google Scholar, and Scient Direct. The review resulted in 15 articles out of 1,223 selected articles. Measles incidence is influenced by maternal factors, child factors, immunization compliance, and promotional media used. Conclusion: The role of health promotion significantly influences individuals' knowledge and decision-making regarding immunization of their children.*

Keywords: *Immunization, Measles, Factors, Health Promotion, Systematic Review*

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INTRODUCTION

Immunization is one of the most cost-effective health interventions, as it can prevent and reduce the incidence of illness, disability, and death due to VPD3I (Immunization-Preventable Diseases) (Wongkar & Alfitri, 2025). Infants and preschool children are more susceptible to measles than adults. Nearly 100% of children who are not immune to the virus can contract measles. This can be exacerbated for toddlers or children experiencing malnutrition, especially those with vitamin A deficiency and/or whose immune systems have been weakened by other diseases (Morales et al., 2023; Ibrahim et al., 2017; van, 2025; Bourke et al., 2016). Measles is a virus of the genus Morbillivirus and belongs to the paramyxavirus group (Rubalskaia et al., 2023; Seki & Takeda, 2022).

This disease is very dangerous and can be transmitted through the respiratory tract when coughing or sneezing (Siregar et al., 2022) and is a significant cause of death in children worldwide (Kyu et al., 2018; Villavicencio et al., 2024). Measles can be prevented through immunization programs, and mothers play a crucial role in ensuring their understanding of immunization, including knowledge, beliefs, and health behaviors. Lack of outreach by health workers can lead to difficulties in understanding and complying with maternal immunization programs. Health workers also play a crucial role in implementing health promotion and disease prevention efforts (Faradilla et al., 2023).

Follow-up immunization coverage is relatively low compared to global figures, with Indonesia's immunization coverage reaching 47.73% in 2020, 40.01% in 2021, 45.13% in 2022, 54.77% in 2023, and 43.46% in 2024 (Rasinta et al., 2025; Rika, 2024). This has impacted the national measles incidence, which has fluctuated with 1,085 cases in 2020, 300 cases in 2021, 3,271 cases in 2022, 3,508 cases in 2023, and 619 cases in 2024 (WHO, 2025). The most important factor in reducing measles incidence is health education about the importance of immunization for children (Cutts et al., 2021; Majekodunmi et al., 2022; Liu et al., 2015).

Health promotion is information or messages that can be conveyed through print, electronic, and outdoor media to increase knowledge and change health behaviors toward positive outcomes (Ghahramani et al., 2022; Perrier & Martin, 2018; Tabassum et al., 2018). Efforts can be made to increase immunization coverage and maternal compliance to reduce measles incidence in children. Media that can be used for health promotion to increase knowledge include direct counseling, leaflets, chat reminders, flyers, videos, and other printed media. In health promotion, there are certainly obstacles in disseminating information to the public, including limited funds for providing supporting media such as videos and printed media (brochures, leaflets) regarding health information (Kandpal & Dutta, 2024; Ntlotlang & Grand, 2016; Ferraz et al., 2025; Bahri et al., 2016). Comprehensive health information about immunization will encourage public participation in immunization.

The persistently high incidence of measles in Indonesia and the significant impact of measles require concrete efforts to address this issue (Ainurafiq et al., 2025; Pasadyn et al., 2025; Pascapurnama et al., 2018; Holzmann et al., 2016). Several studies indicate that several factors influence the persistently high incidence of measles. This study was conducted to synthesize existing research using a systematic review method, followed by a review. The results of this study will ultimately provide answers regarding the role of health promotion in the incidence of measles in children. Therefore, this systematic review is necessary to determine evidence based on published articles and serve as a reference in addressing measles issues based on its causative factors.

METHODS

This study employed a systematic review design to synthesize empirical evidence on the influence of health promotion on the incidence of measles in children. The review followed the Preferred Reporting Items for Systematic Reviews and Meta Analyses guidelines to ensure a structured and transparent process in identifying, selecting, and analyzing relevant studies. The research framework was developed using the PICO approach. The population targeted infants, children aged nine months and above, and toddlers under five years old. The intervention focused on health promotion strategies, including counseling, lectures, leaflets, flyers, booklets, and educational videos. No specific comparison group was defined in this review. The outcomes of interest included factors associated with measles incidence, particularly maternal knowledge, immunization compliance, and the role of health promotion media.

The literature search was conducted using three electronic databases, namely PubMed, Google Scholar, and ScienceDirect. The search process took place between December and February. Keywords were developed based on the PICO framework and included combinations of terms such as health promotion strategy, health promotion, health education, leaflet, video, extension, and measles. The search was limited to articles published between 2020 and 2025 to ensure the inclusion of recent and relevant studies. Eligibility criteria were determined prior to the screening process. Inclusion criteria consisted of original research articles published in English or Indonesian, focusing on populations in Indonesia, and examining health promotion methods or media related to measles immunization or its influencing factors. Studies were excluded if they were duplicates, not accessible, written in other languages, or classified as review articles, commentaries, opinion papers, policy reports, or academic theses.

The study selection process followed several stages. Initially, all identified records were collected and duplicates were removed. Titles and abstracts were then screened to exclude

irrelevant studies. Full texts of potentially eligible articles were further assessed based on the predefined criteria. From the initial pool of 1,223 articles, a large number were excluded due to duplication and irrelevance. After full text evaluation, 15 articles met all inclusion criteria and were included in the final review. Data extraction was conducted by summarizing key information from each selected study, including author, study objective, intervention type, research design, and main findings. The included studies consisted of quasi experimental, cross sectional, and case control designs. The data were analyzed descriptively and synthesized narratively to identify patterns and relationships regarding the role of health promotion in improving maternal knowledge, increasing immunization compliance, and reducing measles incidence in children..

RESULT AND DISCUSSION

In this literature review, we searched for articles using the PICO framework, which consists of the following Ps: Patient/Problem, Intervention, Comparison, and Outcome. This helps identify aspects of a situation and population that have specific conditions and desired outcomes for researchers related to the intervention. The framework is explained as follows:

Table 1. Research Framework Based on Population, Intervention, Comparison, and Outcome (PICO) for Measles Study

Frame Work	Information
Population	Infants/Children 9 Months and Toddlers (under five years old)
Intervention	Health Promotion Strategies, for example, use of media and health promotion methods (Lectures, Counseling, Counseling, Flyers, Leaflets, Educational Videos)
Comparison	No comparison
Outcome	Factors causing measles

The eligibility criteria for this article were focused on using inclusion and exclusion criteria. The criteria used were original research, published in English or Indonesian, discussing various types of health promotion media (extension, counseling, print media, audiovisual media) published in journals within the last five years (2020–2025) with a population in Indonesia. Exclusion criteria included paid articles, textbooks, articles in languages other than English and Indonesian, review/comment articles, opinion articles, reports/policy documents, or thesis reports.

Articles were searched using online databases such as PubMed, Google Scholar, and Science Direct, accessed between December and February. The search keywords were based on PICO. The keywords were "Health Promotion Strategy," "Health Promotion," "Health Education," "Leaflet," "Video," and "Extension." The immunization keywords were "Measles," "Measles," and "Measles."

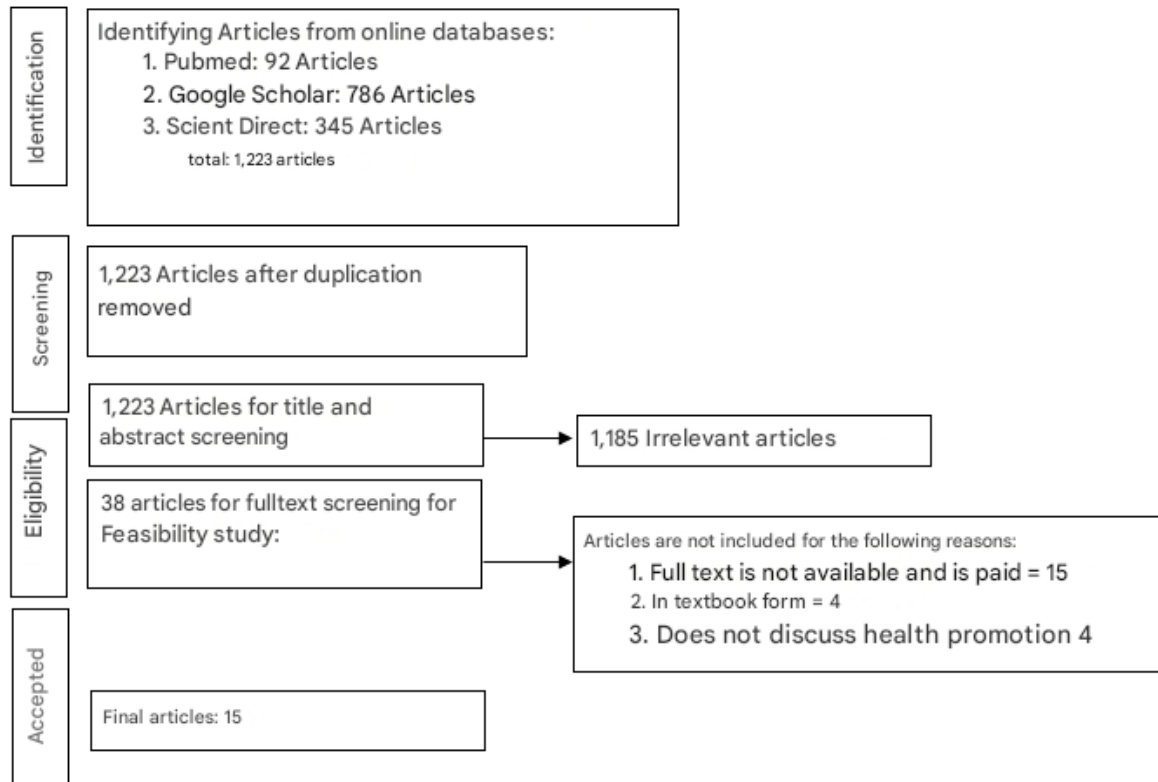


Figure 1. PRISMA Flow Diagram of Article Selection Process

Literature search from 3 databases resulted in 1,223 articles with keywords used by the researcher. There were 80 identical articles (duplicates) and 1,120 irrelevant articles because they did not meet the inclusion criteria, such as the lack of use of health promotion media and the causes of measles, so 23 articles were obtained for selection based on the overall content of the article. From the selection results, 15 articles were found to be in accordance with the research objectives, inclusion and exclusion criteria, so they were included in this study and could proceed to the final article stage.

Table 2. Summary of Selected Studies on Health Promotion and Measles Immunization

Resear chers	Title	Objective	Interventions	Study Design	Results
(Handa yani, 2025)	Changes in Knowledge Levels About Measles Following Outreach at the Jati Raya Community Health Center, Kendari	To determine the effect of health education on increasing public knowledge about measles.	Using a control group as a comparison for pregnant women and parents of toddlers by giving them a questionnaire in the form of a pretest and posttest.	The research used a quasi-experimental approach with one group pretest and posttest.	Counseling can significantly increase public knowledge about measles, from the questionnaire sheets given at pre and post there was an increase in respondents' knowledge about measles, this indicates that counseling is a reflection of the success of educational interventions in building public awareness and readiness in carrying out immunization measures, especially for measles.
(Jalil et al., 2025)	The Influence of Health Promotion Through	Analyzing the influence of health	Filling out the questionnaire to respondents through pre-test	This study uses a quasi-experimental pretest and	In the T test (paired) test, the P value was obtained = 0.0000 where the p-value <0.005 indicates that Ha is

	Educational Video Media on Mothers' Motivation in Providing Measles Immunization to Infants	promotion through educational videos on mothers' motivation in administering measles immunization to infants.	and post-test through accidental sampling, namely mothers who came to the integrated health post (posyandu) in the research work area.	posttest design.	accepted. This means that it can be concluded that there is an influence of educational video media on mothers' motivation in providing measles immunization to babies.
(Nofia et al., 2023)	Effectiveness of Education Using Lecture and Leaflet Methods on Mothers' Knowledge of Complete Basic Immunization	To obtain information that is an approximation of the information that can be obtained with actual experiments.	This study consists of a treatment group with interventions regarding health knowledge and education using lecture media and a health education knowledge group using leaflets.	Experimental quantitative research with a quasi-experimental approach, two-group pretest and posttest design	Based on the results of 50 respondents of intervention through Education and intervention with lectures, the results of health education with the leaflet method were obtained as the most effective method with a large effect with an average value of knowledge before being given the intervention (pre-test) of 48.36 ± 15.01 and after being given the intervention (post-test) of 64.73 ± 14.45 so that there was an average increase in knowledge of 16.36% in increasing mothers' knowledge about basic immunization.
(Indriani et al., 2022)	The Influence of Health Education about Rubella Immunization on the Level of Parental Knowledge at Perwanida 2 Kindergarten, Palangkaraya 2	Analyzing the influence of health education about rubella immunization on the level of knowledge	One group pretest and post test approach with causal relationship involving one group of subjects	Pre-experimental research research design used Wilcoxon	Based on the results of the statistical analysis test using the Wilcoxon test, the p-value was obtained = 0.000 with a significance level of $\alpha = 0.05$. 0.000
(Elsa et al., 2024)	Factors Related to Measles Immunization in Infants	To determine the factors related to administering measles immunization to infants	Interviews and Questionnaires regarding knowledge, attitudes, family support and health workers regarding measles	Descriptive Analytical with case control design	The research was conducted on 60 respondents, 30 cases and 30 controls in the Lampaseh Community Health Center area, Banda Aceh City. The results of the statistical test showed a p-value of 0.008, which means that the mother's attitude has an important role in the decision to provide immunization.
(Faradilla et al., 2023)	The Influence of Leaflet Promotion	To determine the	Questionnaire sheet with pretest and posttest	Quantitative Quasi Experimental	Total respondents 30 people There is a significant value of $0.000 < 0.05$ which states

	Media on Mothers' Knowledge of Basic Immunization in Children at the Integrated Health Post (Posyandu) RW 08, Bojongkukur Village, Bogor Regency in 2022	influence of leaflets and mass media to increase knowledge about immunization in children.	administration to respondents by providing interventions for respondents in maximizing mothers' knowledge regarding completeness of immunization.	l approach with one group pretest - posttest	that there is an influence of leaflet promotional media on increasing mothers' knowledge regarding the completeness of basic immunizations in children.
(Hajar et al., 2024)	The Influence of Booklet Media Education on Mothers' Knowledge and Attitudes Regarding Complete Basic Immunization at Kuala Enok Community Health Center	To determine the influence of booklet media education on mothers' knowledge regarding complete basic immunization in infants aged 0-12 months.	Conducted on mothers who have toddlers aged 0-1.2 months who were registered in February 2024	Pre-experimental research with a one-group pretest and post-test design	H The results of the Wilcoxon non-parametric statistical test analysis obtained a significance value of 0.000 for the knowledge and attitude variables $p < 0.05$, which means that there is an influence of booklet media education on mothers' knowledge and attitudes regarding complete basic immunization in the work area of the Kuala Enok Community Health Center UPT.
(Hudda & Rahman andini, 2024)	Level of Mothers' Knowledge and Compliance with Measles Immunization	Aims to determine the relationship between maternal knowledge and compliance with measles immunization.	Data was collected directly in the form of a questionnaire.	This quantitative research also uses the Cross Sectional or correlational (connecting) type where the research is conducted to see the relationship between existing variables.	The results of the statistical test obtained a p-value of 0.000, which means that there is a significant relationship between two different variables, which indicates that there is a relationship between maternal knowledge and compliance with measles immunization.
(Khalidiah et al., 2023)	The Relationship Between Knowledge and Education Level of Mothers with Compliance Behavior in Providing Basic Capaq Immunization to Infants in the	To find out whether there is a relationship between knowledge and education level of mothers and their compliance	All mothers who have children aged 9 to 24 months who are in the working area of the Sigli City Health Center using an instrument in the form of a questionnaire which was	Type of observational analytical research with a cross-sectional approach	There is a significant relationship between the knowledge of the mother of the baby and compliance with basic measles immunization with a p value = 0.013 and there is a significant relationship between the mother's education level and compliance with basic measles immunization with

	Work Area of the Sigli City Health Center	behavior in administering measles immunization to infants.	distributed directly.		a p value = 0.0015 in babies in the working area of the Sigli Community Health Center.
(Niar & Hasriani, 2024)	Complete basic immunization assistance and counseling	To increase parental knowledge through mentoring and counseling about the importance of complete basic immunization for babies at the Mekar Jaya Integrated Health Post in the Batu-mbatu area, Darma sub-district.	The method used is community outreach involving the community and students; providing pre-tests, outreach, providing leaflet media and finally evaluation.	Measurement with pretest and posttest values	Respondents experienced an increase in knowledge after the counseling, the results obtained from the questionnaire before the counseling were that the average level of knowledge of nursing mothers was 54.96% and after receiving the counseling material, there was a very significant increase in knowledge with an average of 80.5%.
(Nofia et al., 2023)	The Effectiveness of Education Using Lecture and Leaflet Methods on Mothers' Knowledge of Basic Immunization in Pasir Waru Village in 2022	To determine the effectiveness of health education using leaflets and lectures to mothers regarding basic immunizations for children.	The study consisted of a treatment group with interventions regarding knowledge and health education using lecture media and a treatment group with interventions regarding knowledge and health education using leaflet media.	The type of experimental quantitative research is quasi-experimental using a pre-and post-test group design.	The level of maternal knowledge after being given health education about immunization using the terangam method showed an average increase in knowledge of 8.73% with a significant result of p value = 0.004. Meanwhile, the level of maternal knowledge using leaflet media showed a very significant result of p value = 0.000 from the comparative results obtained, it was concluded that health education using leaflet media was a very effective method with a large effect by showing the average value of knowledge before and after the intervention.
(Saptawulan et al., 2025)	The Effect of Health Promotion with a lecture method combined with leaflet and video media on mothers' and	To determine the effect of health promotion with lectures combined with leaflet	The questionnaire was given to mothers in accordance with the research in the form of a pre-test, before health promotion was given using a	Pre-experimental design research with one group pre and post-test research type	There is a significant influence on the provision of health promotion using the lecture method combined with leaflet and video media with the results of MC neman (p value = 0.000 or p = 0.005)

	children's knowledge about complete basic immunization in Pahandut sub-district in the Pahandut Community Health Center working area.	and video media	lecture method combining leaflet and video media and closed with a post-test.		
(Sembiring et al., 2020)	The influence of health promotion about immunization in children aged 0-5 years on increasing maternal knowledge at the Sentani Community Health Center	To find out whether there is an influence of health promotion on immunization in children	Providing questionnaires to mothers who meet the inclusion criteria and conducting interviews	Quantitative research type with pre-experimental design with one group pretest and posttest	The paired sample T-test of -10,869 concluded that H_0 was accepted because the p-value was $0.0000 < 0.05$, so the results showed that there was an influence of health promotion on immunization measured from the predetermined variables.
(Siregar et al., 2022)	The Relationship between Mother's Knowledge about Measles Rubella Immunization and the Provision of Measles Immunization at the Madina Tembung Primary Clinic	To determine the relationship between maternal knowledge and the provision of measles immunization.	Providing questionnaire sheets and direct interviews to respondents	Quantitative research using a cross-sectional approach with an analytical survey	The results of this study indicate that there is a relationship between maternal knowledge about measles-rubella immunization and the provision of measles-rubella immunization at the Madina Tembung Clinic in 2020 with a significant p-value of 0.000.
(Zubir et al., 2025)	Extension management using leaflet media on mothers' knowledge about complete basic immunization in the working area of the Kopelma Darussalam Community Health Center	To determine the effect of health education using leaflets on mothers' knowledge regarding IDL	Providing questionnaires to respondents	This type of research uses Quasi Experimental Pre – Post test	The respondents' knowledge before being given knowledge was 44.1%, after being given counseling and leaflet media, the mothers' knowledge increased by 61.8%.

This systematic review yielded 15 articles, which will be discussed in detail. The research used quasi-experimental, cross-sectional, and case-control designs. The review revealed several interventions that influence health promotion on measles incidence in children. Furthermore, health promotion is a program that delivers information to reduce and prevent measles incidence

in children, including education for parents, counseling for mothers with toddlers and children, health cadres working at integrated health posts (Posyandu) to provide information and education, and the formation of study groups for mothers and children to monitor their nutritional status.

Based on the review, six articles discussed health promotion media in the form of printed leaflets and booklets. Printed leaflets and booklets are a means of conveying information related to health, using sheets containing the methods to be implemented (Faradilla et al., 2023). This media contains various information, either in the form of sentences or images, or a combination of both, which has been modified and can increase reader interest (Agustina et al., 2024). Based on the results of the journal review analysis discussing health promotion media in the form of leaflets and booklets, most of them have an influence on educational understanding regarding complete basic immunization using leaflets with a p-value (0.000) (Zubir et al., 2025). Leaflets are provided by health workers to mothers with toddlers through counseling, this can increase mothers' knowledge regarding providing complete basic immunizations to infants and children. Counseling using leaflets is very effective in preventing measles in children and increasing low immunization coverage. In addition, leaflets are also very effective in increasing mothers' knowledge because the information conveyed regarding the benefits of immunization in infants, the age of immunization, the types of immunizations that must be given according to age, and post-immunization care in infants will later influence immunization administration in infants and this can also reduce the incidence of measles in infants.

This is in line with research (Nofia et al., 2023) which states that the effectiveness of counseling using leaflet media on behavioral changes regarding immunization is very influential in increasing maternal knowledge because of the large amount of information received and the mother's ability to understand the information provided, including information on providing basic immunizations to infants, this can also influence the mother's attitudes and behavior to realize the importance of providing basic immunizations, so that it will increase compliance in providing basic immunizations. In addition, several factors that can influence the provision of immunizations to infants or children, thus having an impact on the incidence of measles are as follows:

Promotional Media Used

Counselling

Health counseling is a process of conveying health information aimed at encouraging changes in community behavior. It also serves as a form of independent intervention that can be used by individuals, families, groups, and the community as a whole to address health issues. Research conducted by Handayani (2025) using a face-to-face "berayam" method can improve respondents' knowledge regarding measles immunization for infants. The results of this analysis were measured by knowledge scores before and after the counseling session. This proves that an interactive, lecture-based approach is an appropriate method for promotive and preventive efforts to prevent measles from an early age.

Providing health education has an impact on increasing mothers' knowledge regarding complete basic immunization for infants before the age of 1 year (Hudda & Rahmanandini, 2024). Furthermore, counseling can be beneficial as an effort to remind parents and families about the child's visit schedule for immunizations according to the recommended schedule and age (Saptawulan et al., 2025). Health promotion, in this case using the lecture or counseling method, conducted by (Sembiring et al., 2020) regarding immunization for children aged 0-5 years at the Sentani Community Health Center, obtained a p-value of 0.000, indicating that health promotion using the lecture method is an effective way to disseminate health information.

Audio and Visual Media

Audiovisual media is a popular health promotion medium among all age groups. Besides presenting health information, this medium allows the public to receive and understand it easily

due to the presence of visual aids and sound, which allows for accurate comprehension (Garcia-Retamero & Cokely, 2017; Galmarini et al., 2024; Robins et al., 2016). Video and audio can help stimulate the senses in the learning process (Nofia et al., 2023). Video is a promotional medium that tends to be more effective in delivering impact, but because it requires the use of two of the human senses, the eyes and ears, it can cause respondents to lose focus on the material flow and simply follow the images, leading to different perceptions (Faradilla et al., 2023).

Video has a positive impact on respondents. One study (Saptawulan et al., 2025) analyzed mothers' knowledge regarding complete basic immunization before and after health promotion through educational videos, with a p-value of $0.000 < 0.005$, indicating a significant effect of mothers' knowledge. A similar study, conducted by Jalil et al., 2024, examined the effect of health promotion through educational videos on mothers' motivation to administer measles immunizations to infants. The analysis yielded a p-value of $0.000 < 0.005$, indicating a significant effect. Video was chosen as a health promotion medium because it is more efficient in disseminating comprehensive information, particularly with the availability of social media on smartphones. Videos can be shared and watched repeatedly, reaching a wider audience.

Print Media

Leaflets are a type of printed media used by health education providers to convey information or health messages through folded leaflets (Tang et al., 2025; Siburian & Ritonga, 2024; Mahardika et al., 2023). These printed media can take the form of posters, booklets, billboards, and so on. A study conducted by Zubir et al., 2025, which examined the average maternal knowledge of complete basic immunization after pre- and post-education using leaflets, yielded a p-value of $0.000 < 0.05$, concluding that leaflet education has an effect on maternal knowledge. The effectiveness of leaflets on mothers' knowledge of immunization, conducted by Nofia et al. (2023), obtained a p-value of 0.000 , a significance level of less than 0.005 , thus indicating that leaflet intervention can effectively improve mothers' knowledge of basic immunization.

Media plays a crucial role in health education by identifying the characteristics of respondents who will receive health information. Print media, in addition to leaflets, includes comics, books, leaflets, booklets, and flipcharts. Booklets are print media with advantages similar to books, allowing for easy reading and learning, presenting health information in a fun, colorful, engaging, easy-to-understand format, and featuring clear images. Research conducted by Hajar et al. (2024) on the effect of booklet media education on mothers' knowledge of immunization yielded a significance value of $0.000 < 0.005$, indicating a positive effect of booklet education on mothers' knowledge. The use of education through print media can cover many people, is practical in its use, because it can be used or can be used anytime and anywhere, does not require electrical installation, besides that, the booklet in its presentation does not only contain text but also contains images so that it makes the data attract readers and is easy for readers to understand.

CONCLUSION

Measles can be prevented by providing health promotion through communication, information, and immunization education by identifying appropriate health promotion factors and strategies. The role of health promotion is considered crucial and significantly influences the improvement of a person's knowledge in making decisions about immunizations for their children. Appropriate health promotion media will impact the improvement of knowledge and behavior of mothers in making decisions about immunizations for children, one of which is measles immunization. The method for delivering health information through socialization is based on what is needed by the target audience through the use of effective media to promote health, both through media (audio and visual), print media (leaflets, banners, flipcharts, booklets, billboards), and counseling (counseling and face-to-face), all of which are very effective in increasing a person's knowledge.

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