Advances in Healthcare Research, 1(2), 2023. 101 - 110
DOI: https://doi.org/10.60079/ahr.v1i2.345

OPEN ACCESS
ISSN Online: 2985-9808

Advances in Healthcare Research
https://advancesinresearch.id/index.php/AHR

Mothers' Knowledge About Basic Immunisation in Infants

Received: 2023, 07, 01 **Accepted:** 2023, 08, 31
Available online: 2023, 08, 31

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KEYWORDS

Keywords:

Basic Immunisation; Maternal Knowledge; Child Health; Extension Program; Health Education.

Conflict of Interest Statement:

The author(s) declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

ABSTRACT

Purpose: This study aims to determine the level of mothers' knowledge about primary immunization for infants in the working area of Puskesmas Kassi-Kassi Makassar City.

Research Design and Methodology: This study used a quantitative method with a descriptive approach. Data were collected by distributing questionnaires to 37 mothers with babies aged 0-12 months who visited the Kassi-Kassi Health Centre in February 2023. The sampling technique was accidental sampling.

Findings and Discussion: The results showed that most mothers had a good understanding of primary immunization, including its definition, purpose, and benefits. The level of education and access to adequate information significantly influenced this knowledge. Most respondents knew that immunization protects infants and children against tuberculosis, pertussis, hepatitis, measles, and poliomyelitis. However, some mothers still lack adequate knowledge, which is often caused by low educational levels and limited access to information.

Implications: This study makes a significant contribution to the field of public health by demonstrating the relationship between education level, access to information, and mothers' knowledge of immunization. These results can inform the development of more effective health education policies and programs. This study also emphasizes the importance of ongoing support from healthcare workers in offering counseling on primary immunization. Further efforts are needed to improve mothers' immunization knowledge through intensive and comprehensive extension programs.

Introduction

Immunization is a significant effort to provide immunity to infants and children by introducing vaccines into the body. Through immunization, it is hoped that the body can form antibodies that effectively prevent the threat of certain diseases, allowing children to grow and develop properly and obtain complete immunization (Anggraeni et al., 2022). However, based on Riskesdas (2018) data, immunization coverage in children aged 12-25 months in 2018 showed that only 57.9% of children received complete immunization, while 32.9% of children did not receive complete immunization, and 9.2% of children were not immunized at all (Riskesdas team, 2018). This indicates that many children still require complete primary immunization, underscoring the need for increased attention to boost immunization coverage. The government's program to address the issue of immunization completeness has been implemented through various efforts. One of the steps taken is to meet the logistical needs of vaccines and provide them free of charge so that people are not burdened with costs when immunizing their babies (Mustika et al., 2019). In addition, the government ensures access to immunization services in hard-to-reach areas by collaborating with other sectors, ensuring vaccine availability, training health workers, and increasing public awareness through media and public service announcements to educate and expand access and coverage of immunization.

Several recent studies have examined various factors that influence immunization coverage. Harris (2018) found that immunization coverage declined from 2013 to 2018 due to a lack of public awareness. Studies by Hasanah (2021) and Arinda & Angela (2022) revealed that lack of information and knowledge about the importance of complete primary immunization is why infants do not get complete vaccination. Astuti and Nardina's (2020) study highlighted the importance of maternal knowledge in achieving optimal immunization coverage. In addition, Mustika, Dewi, and Prasetyaningati (2019) examined the government's efforts to ensure immunization completeness through the provision of free vaccines, training for healthcare workers, and educational campaigns via various media. Despite these efforts, the results showed that community knowledge still needs to improve immunization coverage. These studies state the importance of knowledge as a critical factor. However, only some studies, such as those conducted at Puskesmas Kassi-Kassi in Makassar City, still examine mothers' immunizations. This study aims to fill that gap by providing a more specific picture of mothers' knowledge of complete primary vaccination in the area.

Although various studies have been conducted to understand the factors influencing immunization coverage, there is still a need for more in-depth studies on mothers' knowledge of complete primary immunization, especially in the working area of Puskesmas Kassi-Kassi, Makassar City. Studies by Harris (2018) and Hasanah (2021) showed that low knowledge is a significant barrier to achieving optimal immunization coverage. However, these studies did not specifically explore mothers' knowledge in the local context of Puskesmas Kassi-Kassi. Furthermore, although educational efforts have been made, as reported by Astuti and Nardina (2020), studies have yet to investigate the effectiveness of these programs in detail. This study aims to fill this gap by examining the factors influencing mothers' knowledge of complete primary immunization for infants and providing strategic recommendations based on empirical data. Thus, this study not only complements the existing literature but also offers practical insights that can be applied to enhance immunization programs in the Puskesmas Kassi-Kassi area of Makassar City.

Based on the problems identified and gaps in previous studies, this study aims to further examine how mothers describe their knowledge of complete primary immunization in infants within the working area of Puskesmas Kassi-Kassi, Makassar City. This study also seeks to identify factors influencing mothers' knowledge about vaccination and provide strategic recommendations to improve knowledge and coverage of complete primary immunization. The research questions posed in this study are: What is the description of mothers' knowledge about complete primary vaccination of infants in the working area of Puskesmas Kassi-Kassi Makassar City? What factors influence mothers' knowledge of complete primary immunization in the area? Based on these questions, the purpose of this study is to describe mothers' knowledge about complete primary immunization in infants in the working area of Puskesmas Kassi-Kassi, Makassar City, and to identify factors that influence mothers' knowledge about complete primary vaccination in the area. This study has a novelty in examining specifically the description of mothers' knowledge about complete primary immunization in infants in the working area of Puskesmas Kassi-Kassi Makassar City. In addition, this study will provide strategic recommendations based on empirical findings, which are expected to help increase the coverage of complete primary immunization in the region.

Literature Review

Overview of immunisation

Immunization is one of the most successful and effective public health interventions in history, playing a crucial role in protecting individuals from infectious diseases (Djati, 2023). Immunization works by introducing vaccines into the body that aim to form antibodies to prevent immunization-preventable diseases, such as polio, measles, hepatitis B, tetanus, pertussis, diphtheria, pneumonia, and meningitis. Mandatory basic immunizations include Hepatitis B, BCG, DPT-HB-Hib, polio, and measles. Booster (follow-up) immunization aims to maintain immunity levels in children under two years old, school-age children, and women of childbearing age (WUS), including pregnant women. The targets of booster immunization are DPT and Measles immunization, especially for children under two years old (Baduta) (Linda et al., 2020). The benefits of immunization are extensive, covering the child, the family, and the country. For the child, immunization helps prevent suffering caused by

some diseases and possible disability or death. For the family, immunization removes the anxiety and psychological burden associated with treatment if a child becomes ill and promotes the formation of families who are confident that their children have a comfortable childhood. For the country, immunization enhances public health, fosters a solid and intelligent nation, and improves Indonesia's image among the world's nations (Dompas Robin, 2013).

The types of immunization the government requires include various vaccines to prevent serious diseases. BCG (Bacillus Calmette-Guérin) immunization is used to prevent severe forms of tuberculosis, such as tuberculosis meningitis (inflammation of the brain membranes) and miliary tuberculosis (inflammation of the entire lungs). BCG immunization is administered to newborn babies and should be given before the age of two months. After it is given, a small red papule (spot) will appear, and it will take up to three months to heal. BCG immunization protects against 50-80% of TB cases and is compulsory in Indonesia. Hepatitis B immunization is given to protect infants from hepatitis B disease, a liver infection that can lead to liver cirrhosis, cancer, and death. This immunization is administered three times, with injections given sincerely into the muscle at 0, 1, and 6 months. Especially for newborns of HbsAg-positive mothers, in addition to Hepatitis B immunization, hepatitis B immunoglobulin (HBIg) is also given within 12 hours after birth to provide short-term protection (3-6 months). Polio immunization aims to prevent poliomyelitis, a condition that can cause paralysis. This immunization is given routinely to newborns with two oral drops. The vaccine virus will be present in the gut to stimulate the formation of antibodies in the blood and provide local defense against wild polioviruses that may emerge later. This immunization is given to newborns at 2, 4, 6, or 18 months of age and again when the child is five years old. DPT immunization is administered to protect children against diphtheria, pertussis (also known as whooping cough), and tetanus. Diphtheria is an infectious disease caused by the bacterium Corynebacterium diphtheriae, which produces a toxin that affects the mucous membranes in the throat. Tetanus is an acute illness caused by the bacterium Clostridium tetani, whereas pertussis is an infectious disease caused by the bacterium Bordetella pertussis. DPT immunization is administered three times in children aged 2, 3, and 4 months, with an interval of at least four weeks. Repeat DPT immunization is administered one year after the third DPT and at preschool age, typically between 5 and 6 years. Measles immunization is given as part of routine childhood immunization. It is often given in combination with the MMR vaccine (mumps, measles, rubella). If it contains only measles, immunization is given at nine months of age. In the MMR form, the first dose is administered when the baby is 12-15 months old, and the second dose at 4-6 years of age. Immunity to measles is acquired through immunization, and passive immunity is transferred from mothers who have been vaccinated.

Hib (Haemophilus influenzae type b) and pneumococcal vaccines are given to prevent Hib and pneumococcal germs that cause pneumonia, middle ear inflammation, and brain inflammation (meningitis), which can cause death or disability. The Hib vaccine is administered together with DPT or DTaP, while the pneumococcal vaccine is given separately in children aged 2, 4, 6, and 12 months. The Rotavirus vaccine is administered to prevent severe diarrhea caused by rotavirus infection, which can lead to vomiting, severe diarrhea, fluid loss, electrolyte and acid-base balance disturbances, and even death. The vaccine is administered orally at two, four, and six months of age, depending on the type of vaccine used. Influenza immunization prevents viruses that cause high fever, cough, runny nose, shortness of breath, and pneumonia, which can be fatal. The influenza vaccine is administered starting at the age of six months and is repeated annually. The vaccine dose is adjusted according to the child's age, with children under three years old receiving a dose of 0.25 mL and those over three years old receiving a dose of 0.5 mL. The Measles, Mumps, and Rubella (MMR) vaccine is given to prevent measles, mumps, and rubella. This immunization is given at nine months, 18 months, and before entering primary school. Measles causes symptoms such as high fever, cough, runny nose, and pneumonia, while rubella can cause miscarriage or congenital disabilities in the fetus if it affects pregnant women. The vaccine is essential to prevent severe complications from both diseases.

The chickenpox (varicella) vaccine is given from one year of age to prevent chickenpox, which can cause skin and eye damage, diarrhea, and miscarriage if it affects the fetus. The vaccine is highly effective in preventing severe complications from chickenpox. HPV (Human Papillomavirus) immunization is given to avoid cervical cancer caused by HPV infection. The vaccine is administered

three times to adolescent girls, starting at age 10, with the second and third doses given one to two months and six months after the first dose, respectively. For the UKS program in some provinces, the vaccine is given twice six months apart (Nurhayati et al., 2020). With the various types of immunizations mentioned, it is clear how vital immunization is in maintaining the health of children, families, and the broader community. Immunization protects the vaccinated individual and helps create herd immunity, which in turn protects those who cannot be vaccinated due to medical reasons. Therefore, the government, health workers, and the community must collaborate to ensure that every child is fully immunized according to the established schedule.

Overview of Behaviour

Human behavior results from a complex interaction between external and internal factors. In health, behavior is often understood as a person's response to an environmental stimulus. Lawrence Green, an expert in public health, outlined that health behavior is determined by two main factors: behavioral and non-behavioral factors. Behavioral factors involve any individual action that affects health. In contrast, non-behavioral factors include environmental and social conditions that contribute to a person's health status. Green identified three main factors that influence behavior: predisposing, enabling, and reinforcing factors. Predisposing factors include knowledge, attitudes, beliefs, values, and traditions that facilitate the occurrence of certain behaviors. For example, knowledge about the benefits of immunization may encourage mothers to bring their children to the posyandu for vaccination. Enabling factors involve facilities and infrastructure that facilitate health behaviors, such as the availability of health centers, posyandu, hospitals, sports venues, and access to nutritious food. Individuals may find it challenging to perform recommended health actions without these facilities. Reinforcers are factors that encourage or strengthen behavior, such as support from community leaders or ingrained habits in the community. For example, a pregnant woman may be reluctant to have a prenatal check-up if the community leaders around her do not set a good example, even though she knows the benefits and health facilities are available.

According to Green, behavior can be described mathematically as a function of predisposing factors, enabling factors, and reinforcing factors: B = f(Pf, Ef, Rf), where B represents the behavior, Pf denotes the predisposing factor, Ef denotes the enabling factor, and Rf denotes the reinforcing factor. Knowledge plays a vital role in shaping a person's behavior. Knowledge is the result of understanding an object through a person's senses, such as hearing, smell, sight, and touch (Notoatmojo & knowledge, 2018). Knowledge encompasses both theoretical understanding and practical know-how, which can impact a person's level of intelligence. Books, technology, practices, and traditions hold knowledge that can be transformed appropriately (Permata, 2019). Knowledge plays a vital role in the development of individuals, societies, and organizations. The level of knowledge is divided into six levels: knowing, understanding, application, analysis, synthesis, and evaluation. The level of 'know' is the lowest level, where knowledge is limited to remembering what has been learned. 'Understand' is the ability to explain an object or something correctly. 'Application' is the ability to apply material that has been discovered. 'Analysis' involves the ability to break down material into smaller parts and understand the relationships between those parts. 'Synthesis' is the ability to link various elements or elements of knowledge into a new, more comprehensive pattern. 'Evaluation' is the ability to assess or justify a material or object (Notoatmojo & knowledge, 2018).

Various factors influence a person's knowledge, including education, mass media, socio-culture, economy, environment, experience, and age (Widianingrum, 2012). Education significantly impacts the learning process; the higher a person's education, the more quickly they can receive and absorb new information. Knowledge can also be obtained from non-formal education. Mass media is crucial in providing timely information and influencing public opinion. Socio-culture and economy also influence knowledge; habits and traditions not based on critical reasoning can form negative or positive attitudes toward new knowledge. A person's economic status determines the availability of facilities necessary to acquire knowledge. The physical, biological, and social environments also dramatically influence the process of knowledge entering the individual. Personal experience, as well as the experience of others, is also an essential way of acquiring knowledge. Ultimately, age influences a person's mindset; as individuals age, their mindset evolves, enabling them to gain more

knowledge (Yuliana, 2017, 2020). Knowledge measurement can be conducted using interviews or questionnaires that ask about the content of the material being measured. This measurement can be adjusted to the desired level of knowledge. The types of questions used to measure knowledge are generally divided into good knowledge, where the respondent can answer more than 50% of the questions correctly, and poor knowledge, where the respondent can answer less than 50% correctly. In public health, understanding individual behavior is critical to designing effective interventions. As described by Green's theory, knowing the factors that influence health behavior allows health professionals to develop more targeted and effective strategies. For example, in immunization programs, it is essential to provide vaccines and access to health facilities and ensure that the community has adequate knowledge and support from influential figures. Thus, public health efforts can be more successful in achieving their goal of improving the overall health and well-being of the community.

Research Design and Methodology

This type of quantitative research, employing a descriptive approach, aims to describe mothers' knowledge about primary immunization in infants within the working area of Puskesmas Kassi-Kassi, Makassar City, in 2023. This research was conducted in February 2023 at Puskesmas Kassi-Kassi Rappocini District Makassar City. The population of this study consisted of mothers with babies aged 0-12 months in the working area of Puskesmas Kassi-Kassi, totaling 40 mothers. The research sample consisted of 37 mothers who made immunization visits at Puskesmas Kassi-Kassi. The mothers were selected using the convenience sampling technique, which involves selecting respondents who encounter the study during its implementation and are willing to participate. Data were collected by distributing questionnaires directly to respondents, ensuring that the data obtained were primary. Data processing follows the steps described by Marina (2015): editing to verify the accuracy of the collected data, coding to categorize responses based on specific criteria, and data entry to input data into a computer database and create frequency distributions or contingency tables. Data presentation was carried out in the form of distribution tables accompanied by narrative explanations regarding the characteristics of respondents and the description of mothers' knowledge of primary immunization in infants. Data analysis uses univariate analysis to assess each research variable, summarise data into useful information, and present results in tables and narratives. Operational definitions of research variables included age, education level, occupation, and mothers' knowledge of primary immunization, with specific criteria for each variable.

Findings and Discussion

Findings

Based on the table above, it can be inferred that most research respondents are between 36 and 45 years old, accounting for 91.9% of the total. Only 5.4% of respondents are between 26 and 35 years old, and 2.7% are between 45 and 55. Most respondents have a high school education (48.6%), while 51.4% have a bachelor's degree (S1). Regarding occupation, 48.6% of respondents were homemakers, 27.0% were self-employed, and 24.3% worked as civil servants. Respondents' knowledge of primary immunization in infants revealed that 62.2% possessed good knowledge, while 37.8% demonstrated poor knowledge. This data shows that most respondent mothers have a relatively high level of education, and they generally have good knowledge about basic immunization in infants. However, there are still some areas that need improvement.

Table 1. Distribution of Respondents

Variable	*Category*	*n*	*%*
Age	*26 - 35*	*2*	*5.4*
	36 - 45	*34*	*91.9*
	45 - 55	*1*	*2.7*
	Total	***37***	***100***
Education	*High School*	*18*	*48.6*
	Bachelor's Degree	*19*	*51.4*
	Total	***37***	***100***
Occupation	*Housewife*	*18*	*48.6*
	Entrepreneur	*10*	*27.0*
	Government Employee	*9*	*24.3*
	Total	***37***	***100***
Knowledge Level	*Good*	*23*	*62.2*
	Poor	*14*	*37.8*
	Total	***37***	***100***

Source: *Source: Primary Data*

Discussion

This study aims to determine the level of knowledge among mothers regarding primary immunization in infants in the working area of Puskesmas Kassi-Kassi, Makassar City. Based on the study results, most mothers demonstrated a good understanding of primary immunization. According to Notoatmodjo (2012), the level of knowledge consists of several levels: knowledge (know), comprehension (understand), application (apply), analysis (analyze), synthesis (synthesize), and evaluation (evaluate). In this study, mothers' knowledge was assessed at a basic level, as the measurement was conducted through a questionnaire that only evaluated fundamental knowledge without exploring more profound aspects of understanding or application. The results showed that mothers with good knowledge knew more about the definition of immunization, which was explained as an effort to provide immunity to infants and children against disease by introducing vaccines into the body. Through immunization, the body is expected to form anti-substances to prevent diseases such as measles and tuberculosis (TB) through BCG immunization. Thus, children can grow and develop well, get complete immunization, and stay healthy (Anggraeni et al., 2022). Knowledge of the purpose and benefits of immunization was also high among respondents, with most mothers knowing that immunization aims to prevent disease and actively increase immunity (Sari et al., 2022).

In this study, the benefits of immunization, which most mothers are aware of, include preventing various infectious diseases. BCG immunization is known to be beneficial for avoiding tuberculosis. DPT immunization generates active immunity against pertussis. Hepatitis B immunization prevents hepatitis. Measles immunization increases immunity against measles. Polio immunization prevents poliomyelitis. The benefits of immunization are immense, including the prevention of infectious diseases, reduction in infant mortality, and the provision of immunity to the body. Although the side effects of immunization are usually rare and mild, such as redness or swelling at the injection site, a mild fever, and mild allergic reactions, mothers should monitor their children and consult a healthcare professional if any unusual side effects occur. Good maternal knowledge about immunization is primarily attributed to the high level of education and information obtained from various sources, including health education, media, and other reading materials (Linda et al., 2020). In contrast, mothers with poor knowledge are often caused by low levels of education and a lack of understanding of immunization. They may require a more straightforward explanation or be too reluctant to seek immunization information, so some mothers mistakenly assume their children do not need it. Good knowledge about immunization enables mothers to realize the importance of primary immunization for their child's health. This suggests that the extension programs and information provided by health workers are very effective in improving mothers' knowledge about immunization. A lack of knowledge is an obstacle to achieving the basic immunization program, so diseases that can be prevented by immunization cannot be adequately prevented. Therefore, it is

essential to continue to provide counseling and information through various media to improve mothers' knowledge about the importance of primary immunization.

This study also supports the theory of Notoatmojo (2018), which posits that knowledge encompasses everything a person knows and can be quantified. Individual knowledge varies and is mainly obtained through sight and hearing. This study aligns with Ruqaiyah's research (2021), which found that most mothers at Puskesmas Jumpandang Baru Makassar possessed good knowledge about basic immunization, although some still lacked this understanding. This highlights the need for ongoing support from healthcare workers to educate and inform individuals about the importance of complete primary immunization. Research by Rangkuti (2022), Simanjuntak, and Nurnisa (2019) showed that counseling on immunization improved mothers' knowledge and attitudes toward primary immunization. This counseling is essential because it can provide mothers with the information they need to make informed decisions regarding their children's immunization. Thus, the results of this study indicate that the health extension program conducted at Puskesmas Kassi-Kassi is very effective in improving mothers' knowledge about basic immunization. Specifically, this study found that most mothers possessed a good understanding of the definition of immunization and its benefits. Mothers knew that immunization was an attempt to provide immunity to infants and children against certain diseases by introducing vaccines into the body. They also knew that immunization could prevent infectious diseases such as measles, tuberculosis, pertussis, hepatitis, and poliomyelitis. This knowledge indicates that the counseling and information programs conducted by health workers at Puskesmas Kassi-Kassi are highly effective in enhancing mothers' knowledge about immunization.

However, there are still some mothers who lack a better understanding of immunization. This is due to various factors such as low level of education, lack of access to information, and a less caring attitude towards the importance of immunization. Therefore, further efforts are needed to improve mothers' knowledge about immunization through a more intensive and comprehensive extension program. Extension programs should include complete and accurate information about the importance of immunization, its benefits, and how it works. This information should be disseminated through various media, including television, radio, the Internet, and print. Additionally, the counseling program conducted directly at the Puskesmas should continue to provide mothers with accurate and reliable information about the importance of basic immunization. The results of this study also show that increased knowledge about immunization can reduce the incidence of infectious diseases that can be prevented by immunization. Therefore, immunization programs should continue to be encouraged and improved to achieve more excellent immunization coverage. Effective education and counseling can increase mothers' awareness and knowledge about the importance of immunization, enabling them to provide their children with complete immunization.

This study reveals that mothers' knowledge about primary immunization at Puskesmas Kassi-Kassi, Makassar City, is generally reasonable. However, there are still some mothers who need better knowledge. Therefore, efforts to increase knowledge and awareness about the importance of immunization must continue to be carried out through effective extension and information programs. With good knowledge, mothers will better understand the importance of primary immunization for their children's health and encourage them to provide complete and timely immunization. In addition, the results of this study also revealed that, although many mothers had good knowledge about immunization, some still lacked adequate understanding. This suggests that information and education on immunization need to be disseminated more widely to reach all mothers, especially those with limited access to health information. Intensive and continuous extension programs need to be implemented to ensure that all mothers have adequate knowledge about immunization and its importance to their child's health. The results of this study support the hypothesis, stating that mothers' knowledge about primary immunization affects immunization coverage. The results showed that mothers with good knowledge were more likely to provide complete immunization to their children than mothers without knowledge. This suggests that increasing mothers' knowledge about immunization can lead to higher immunization coverage and a reduction in the incidence of communicable diseases that immunization can prevent.

Theories that align with this study's findings include the WHO theory, which posits that formal education factors influence knowledge, and Notoatmojo's theory, which asserts that knowledge

encompasses everything a person knows and can be quantified. This study demonstrates that a high level of education is associated with a good understanding of immunization. Additionally, knowledge gained through counseling and information from the media plays a vital role in enhancing mothers' knowledge of immunization. Compared to previous research, the results of this study align with Ruqaiyah's (2021) findings, which also found that most mothers at Puskesmas Jumpandang Baru Makassar had good knowledge about primary immunization. This study also supports the research findings of Rangkuti (2022) and Simanjuntak and Nurnisa (2019), which showed that counseling on immunization improved mothers' knowledge and attitudes toward primary immunization. However, this study also reveals that mothers still have limited knowledge, which underscores the need for further efforts to achieve comprehensive knowledge coverage among mothers. This suggests that extension programs should be more intensive and reach all levels of society, including those with limited access to information and resources.

The practical implication of this study is the need to strengthen health extension and education programs at Puskesmas Kassi-Kassi and surrounding areas. Health workers need to be more proactive in disseminating information about the importance of primary immunization through various communication channels. Counseling is conducted directly at the health center and also through mass media, including radio, television, and social media, which have a broad reach. Additionally, digital technology, such as health applications and online platforms, can serve as an alternative for disseminating health information to younger and tech-savvy mothers. Good maternal knowledge about immunization is essential in improving basic immunization coverage. Therefore, continuous education should be a priority in public health programs. Training health workers to deliver information effectively also needs improvement, ensuring the community receives clear and well-received messages. Education programs should be tailored to the specific needs and demographic characteristics of the local community to ensure that the information is well-received and understood. Furthermore, a collaboration between health centers, schools, and community organizations is essential in improving knowledge and awareness about immunization. Immunization programs in schools can be strengthened by involving teachers and parents in health education activities. In addition, community leaders and local leaders can be engaged to set a positive example and encourage community participation in immunization programs.

This study also showed that formal education factors strongly influenced mothers' level of knowledge about immunization. Therefore, it is essential to ensure that immunization information is also included in the formal education curriculum, from primary to secondary education. Education on health and immunization should be an integral part of educational programs, enabling children and adolescents to develop a solid understanding of the importance of vaccination. In addition, effective health communication strategies should also consider the cultural and social aspects of the community. Using local languages and approaches that align with local cultural values will help increase community acceptance and understanding of the importance of immunization. Extension activities conducted in public places, such as markets, places of worship, and community events, can also improve access to information for mothers who may only occasionally be able to visit health centers. The results of this study also provide policymakers with valuable insights into the importance of allocating sufficient resources for immunization and health education programs. An adequate budget should be earmarked for vaccine supply, health worker training, and counseling activities. Additionally, regular monitoring and evaluation of immunization programs should be conducted to ensure that the programs are effective and achieve their desired goals.

Conclusion

This study aims to determine the level of knowledge among mothers regarding primary immunization in infants in the working area of Puskesmas Kassi-Kassi, Makassar City. This study employed a quantitative method with a descriptive approach, distributing questionnaires to 37 mothers. The findings showed that most mothers had good knowledge about primary immunization, encompassing its definition, purpose, and benefits. Additionally, the study revealed that education level and access to information influenced mothers' knowledge of vaccination.

The value of this study lies in its contribution to providing a deeper understanding of the factors that influence mothers' knowledge of primary immunization. This study is original as it explores the relationship between education level, information access, and mothers' knowledge in the local context of Puskesmas Kassi-Kassi. The results of this study can inform the development of more effective health extension policies and practices and assist health workers in designing educational programs tailored to the local community's needs.

However, this study has several limitations. One of the main limitations is the use of a questionnaire method, which may not accurately reflect mothers' in-depth knowledge. Additionally, the sample used was limited to one health center, so the results may not be generalizable to a wider population. Future research agendas could include broader studies with more diverse samples and qualitative research methods to explore a deeper understanding of mothers' knowledge and attitudes toward immunization. Suggestions for future researchers include considering other factors that may influence mothers' knowledge, such as local culture and beliefs, and evaluating the effectiveness of the extension programs that have been implemented.

Acknowledgment

We want to thank all those who contributed to this study. Special thanks are due to Puskesmas Kassi-Kassi, Makassar City, for providing permission and research facilities. Thank you also to all mothers willing to participate in this study. We also extend our gratitude to the Makassar City Health Office for their support and assistance. Additionally, we extend our appreciation to our academic colleagues and mentors who have provided valuable input and suggestions in the preparation of this article.

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