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# Determinants of Compliance of Mothers on Vaccine Preventable Diseases (VPD) Immunization at the Rural Health Units of the 5th District of Camarines Sur

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ABSTRACT

The study examined the determinants of compliance with vaccine preventable diseases (VPD) immunization among mothers with children aged ≥1 year in the rural health units of the 5th District of Camarines Sur, Philippines. The research utilized a descriptive analytical research design employing a questionnaire to gather data. The findings reveal a diverse demographic profile among the respondents, highlighting factors such as age, civil status, religion, number of children, educational background, occupation, and family income. The study indicates a strong commitment to vaccination practices among mothers, with notable emphasis on prioritizing immunization appointments and recognizing the importance of vaccination for preventive healthcare. Factors influencing compliance include access to healthcare services, knowledge and awareness about vaccines, attitudes and beliefs, socio-economic status, and the availability of healthcare infrastructure. Religion and family monthly income emerged as significant predictors of compliance, underscoring their impact on immunization adherence. Based on the study's results, a proposed plan to enhance compliance focuses on educational campaigns, improved accessibility, personalized support, and incentives for mothers. By addressing these areas, the plan aims to increase vaccination rates and ensure effective implementation of VPD immunization programs.

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## Introduction

The health and happiness of our children are key to the future of our society. They are the epitome of innocence, joy, and hope. As guardians of their well-being, it is our utmost responsibility to ensure their health and safety. One of the most powerful tools we have in ensuring their health and well-being is vaccine-preventable diseases (VPD) immunization. VPD immunization is important in children because it helps protect them from deadly diseases and ensures their overall health and well-being. By vaccinating children, we can eliminate or greatly decrease the spread of dangerous diseases, thus creating a safer community for everyone.

Vaccination is a cornerstone of public health, playing a crucial role in preventing and controlling infectious diseases. The World Health Organization recognizes vaccination as one of the most cost-effective public health interventions, contributing significantly to the achievement of Sustainable Development Goal (SDG) 3, which aims to "ensure healthy lives and promote well-being for all at all ages" [1]. This goal emphasizes the importance of reducing preventable deaths and improving health outcomes through various interventions, including immunization. Despite the proven effectiveness of vaccines in protecting individuals and communities from preventable diseases, vaccine hesitancy and low immunization coverage remain significant challenges.

While national immunization programs exist in the Philippines, achieving high and consistent coverage rates remains a challenge, particularly in rural areas [2]. Studies have identified various factors contributing to incomplete immunization, including geographical barriers, transportation difficulties, limited access to healthcare facilities, and vaccine hesitancy due to misinformation or cultural beliefs [3].

Data from the Department of Health (DOH) show that the coverage of fully immunized children in the 5th District of Camarines Sur has been monitored over a three-year period from 2021 to 2023. The data represent the percentage of fully immunized children in each municipality. The coverage for fully immunized children in Baao has shown a slight increase over the three-year period, with the percentages recorded as 42%, 41%, and 54%, respectively. Balatan has experienced a slight decline in the coverage of fully immunized children, with the percentages recorded as 46%, 42%, and 39%, respectively. The coverage for fully immunized children in Bato has remained relatively stable over the three-year period, with the percentages recorded as 29%, 28%, and 27%, respectively. Buhi has maintained a relatively high coverage for fully immunized children, with the percentages recorded as 58%, 54%, and 53%, respectively. Bula has shown a slight decline in the coverage of fully immunized children, with the percentages recorded as 56%, 46%, and 44%, respectively. The coverage for fully

immunized children in Nabua has shown a slight increase over the three-year period, with the percentages recorded as 43%, 38%, and 45%, respectively.

This data from the DOH is one of the reasons why the researcher wanted to study the research topic, as it shows that only about 50 percent of the targeted children are fully immunized [2]. While a national immunization program exists in the Philippines, achieving high and consistent coverage rates remains a challenge, particularly in rural areas. Another reason why the researcher focused on this study is that, as someone who closely interacts with mothers, the researcher had the opportunity to learn about the reasons some mothers are hesitant to vaccinate their children. The urgency of this study is further highlighted by the recent resurgence of vaccine-preventable diseases in the country. The researcher believes that this research topic is timely, considering the current increase in the cases of pertussis, measles, and polio in the Philippines.

This study focuses on understanding the determinants of compliance with VPD immunization among mothers in the rural health units (RHUs) of the 5th District of Camarines Sur. By identifying the factors affecting mothers' decisions to vaccinate their children, this research aims to contribute to the development of targeted interventions and strategies to improve immunization coverage and promote the well-being of children. This research is not just an academic endeavor but a commitment to public health and the well-being of our community. By improving compliance with VPD immunization, we can create a healthier and more resilient community for children.

## Literature Review

Immunization against vaccine-preventable diseases (VPDs) has long been recognized as one of the most effective public health interventions. The World Health Organization considers vaccination a central strategy in achieving Sustainable Development Goal (SDG) 3, which aims to "ensure healthy lives and promote well-being for all at all ages" [1]. Despite the proven benefits of vaccination, vaccine hesitancy and low immunization coverage remain critical challenges in many parts of the world, including the Philippines [2].

Various studies have explored the determinants that influence parental compliance with childhood immunization. One study identified geographic barriers, transportation difficulties, and limited access to healthcare facilities as major contributors to incomplete immunization in rural areas [3]. Similarly, another study conducted in Alicia, Isabela emphasized that accessibility to government health facilities offering free vaccines plays a significant role in mothers' decisions to immunize their children [4].

Regarding knowledge and awareness, it was reported that parents generally possess a good understanding of recommended vaccines and schedules, but they are less proactive in seeking reliable information, especially from local media or official sources [5], [6]. This finding aligns with the present study, which identified limited awareness of government-supported immunization programs.

In terms of attitudes and beliefs, studies revealed that parental confidence in scientific evidence, trust in healthcare providers, and fear of adverse side effects significantly influence vaccine uptake [7], [8]. These psychosocial factors are often compounded by misinformation spread through community networks and social media.

Socio-economic factors have also been widely studied as predictors of vaccination behavior. Research has demonstrated that parental education and household income levels strongly correlate with immunization rates [9], [10]. Children from families with lower income or educational attainment are more likely to be under- or unvaccinated.

Moreover, cultural and religious influences have emerged as important variables. A study found that religious affiliation and beliefs significantly affect vaccination decisions, particularly in conservative communities [11]. This is consistent with the findings of the current study, where religion and family income were identified as statistically significant determinants of compliance with VPD immunization.

Collectively, these studies provide a strong theoretical foundation for understanding the multifaceted factors influencing maternal compliance with immunization. The present research builds upon this body of knowledge by examining these determinants in the specific rural context of the 5th District of Camarines Sur, Philippines.

## Material And Methods

### A. Research Design

This study utilized the analytical research design, focusing on identifying the factors (determinants) that influence mothers' compliance with vaccine-preventable disease (VPD) immunization in the 5th District of Camarines Sur. Analytical research is a systematic and organized investigation that seeks to understand, explain, and dissect complex phenomena by examining their components and relationships. It involves critically analyzing data, facts, or information to draw meaningful conclusions, identify patterns, and gain insights [12]. This approach involves collecting data from mothers at the rural health units of the 5th District of Camarines Sur, analyzing it statistically, and drawing conclusions about the relationships between various factors (e.g., socio-economic status, knowledge, attitudes, access to healthcare) and their compliance with VPD immunization programs. This

analytical approach allows for a deeper understanding of the complex factors contributing to vaccination decisions and provides valuable insights for improving immunization rates in the district.

## B. Respondents of the Study

The respondents in this study consisted of mothers with children aged one year and above from four specific municipalities in the 5th District of Camarines Sur, where completion of necessary vaccinations by the age of one is expected.

The sample size was determined using Slovin's formula and then distributed among the municipalities based on the total number of mothers listed in the master list, applying stratified random sampling. Stratified random sampling is a method that enables researchers to select a sample that accurately represents the entire population under study [13]. This approach offers a more precise and comprehensive representation compared to simple random sampling. By employing this technique, the researcher identified and included mothers from Buhi (62), Baao (66), Bula (55), and Balatan (53), totaling 236 mothers. Focusing on these specific municipalities allowed for the inclusion of a diverse range of perspectives and experiences related to VPD immunization. This targeted sampling strategy facilitated a detailed examination of the factors affecting compliance with VPD immunization across different municipalities within the district, enhancing the depth and accuracy of the study's findings.

## C. Research Instruments

The main instrument used in the study was a self-made questionnaire designed to gather data from mothers at the rural health units of the 5th District of Camarines Sur regarding their compliance with VPD immunization. The data were collected using a survey method. The questionnaire consisted of a series of close-ended questions to obtain structured responses from the participants.

As a research instrument, the questionnaire was developed to obtain the necessary data for the study. The information acquired was crucial for accurate data processing and was analyzed to arrive at credible conclusions. The questionnaire was structured to reflect the key determinants of compliance identified in the literature.

## D. Data Gathering Procedure

Discussed herein is the data gathering procedure facilitated by the researcher to answer the investigation on the determinants of compliance of mothers on vaccine preventable diseases immunization at the rural health units of the 5th district of Camarines Sur. The questionnaire is the primary tool used to gather data. The questions were concise for easy understanding. The questionnaire was divided into three parts. The first part focuses on the profile of the respondents; the second part is the level of compliance of mothers on vaccine preventable diseases immunization; and the third part contains factors that influence the level of compliance of mothers on vaccine preventable diseases immunization. Prior to finalization, the questionnaire was reviewed by seasoned researchers and adviser and their suggestions were incorporated to improve its quality. A preliminary test was conducted with five mothers who were not part of the target sample to assess the questionnaire's clarity and effectiveness. The results of this pilot test led to further refinements of the questionnaire. Finally, the questionnaire was revised and reproduced for the final run after incorporating all the suggestions in the validation process.

## E. Data Analysis

The following statistical procedures were used to interpret the data gathered from the respondents of the study:

1. Percentage Technique

   The percentage was calculated by dividing the frequency in each category by the total number of participants and multiplying by 100 percent. This technique was used to analyze the profile of respondents [14].

2. Weighted Mean

   The weighted mean was used to assess the level of compliance of mothers and influencing factors. It was computed by multiplying each value by its respective weight, summing the results, and dividing by the total weight [15].

3. Multiple logistic regression

   Multiple logistic regression is a mathematical model to estimate the relationship between the predictor variables and the probability of the outcome. The model is based on the odds ratio, which represents the change in the odds of the outcome for a one-unit increase in the predictor variable. Multiple logistic regression was used in analyzing the determinants of vaccination compliance.

## Results and Discussion

### A. Profile of the Respondents

This section presents the demographic profile of the respondents, which provides foundational context for interpreting the findings of the study. Understanding respondents' background characteristics such as age, civil status, religion, number of children, educational attainment, occupation, and monthly family income is essential in analyzing patterns and potential influences on compliance with vaccine-preventable diseases (VPD) immunization. The following tables show the frequency and percentage distribution of the respondents based on these variables.

**Table 1.** Distribution of Respondents in Terms of Age

| Indicators | Frequency | Percentage | Rank |
|---|---|---|---|
| Below 18 years old | 11 | 4.66 | 5 |
| 18 – 25 years old | 63 | 26.69 | 3 |
| 26 – 33 years old | 67 | 28.39 | 1 |
| 34 – 41 years old | 66 | 27.97 | 2 |
| 42 years old and above | 29 | 12.29 | 4 |
| **Total** | **236** | **100.00** | |

**Table 2.** Distribution of Respondents in Terms of Civil Status

| Indicators | Frequency | Percentage | Rank |
|---|---|---|---|
| Single | 93 | 39.41 | 2 |
| Married | 131 | 55.51 | 1 |
| Widowed | 4 | 1.69 | 4 |
| Separated | 8 | 3.39 | 3 |
| **Total** | **236** | **100.00** | |

**Table 3.** Distribution of Respondents in Terms of Religion

| Indicators | Frequency | Percentage | Rank |
|---|---|---|---|
| Roman Catholic | 155 | 65.68 | 1 |
| Iglesia ni Cristo | 36 | 15.25 | 3 |
| Born Again Christian | 44 | 18.64 | 2 |
| Muslim | 1 | 0.42 | 4 |
| **Total** | **236** | **100.00** | |

**Table 4.** Distribution of Respondents in Terms of Number of Children

| Indicators | Frequency | Percentage | Rank |
|---|---|---|---|
| 1 Children | 46 | 19.49 | 2 |
| 2 – 3 Children | 129 | 54.66 | 1 |
| 4 – 5 Children | 41 | 17.37 | 3 |
| 5 above | 20 | 8.47 | 4 |
| **Total** | **236** | **100.00** | |

**Table 5.** Distribution of Respondents in Terms of

| Indicators | Frequency | Percentage | Rank |
|---|---|---|---|
| Elementary Graduate | 34 | 14.41 | 3 |
| High School Graduate | 96 | 40.68 | 1 |
| College Graduate | 87 | 36.86 | 2 |
| Post Graduate | 19 | 8.05 | 4 |
| **Total** | **236** | **100.00** | |

**Table 6.** Distribution of Respondents in Terms of Occupation

| Indicators | Frequency | Percentage | Rank |
|---|---|---|---|
| Employed Full-Time | 59 | 25.00 | 2 |
| Employed Part-Time | 35 | 14.83 | 4 |
| Unemployed | 101 | 42.80 | 1 |
| Self Employed | 41 | 17.37 | 3 |
| **Total** | **236** | **100.00** | |

**Table 7.** Distribution of Respondents in Terms of

| Indicators | Frequency | Percentage | Rank |
|---|---|---|---|
| 5,000 and below | 69 | 29.24 | 2 |
| 5,000 -15,000 | 85 | 36.02 | 1 |
| 15,000 – 25,000 | 43 | 18.22 | 3 |
| 25,000 and above | 39 | 16.53 | 4 |
| **Total** | **236** | **100.00** | |

**B. Level of Compliance of Mothers on Vaccine Preventable Diseases at the Rural Health Units of the 5th District of Camarines Sur**

The compliance level of mothers with regards to vaccine preventable diseases immunization at the rural health units of the 5th District of Camarines Sur showcases a significant dedication to ensuring their children receive timely vaccinations.

The data from Table 8 highlights several key insights into the behaviors and beliefs of mothers in the community. The statement that received the highest mean score of 3.69 and is ranked 1 for being Highly Complied is "I prioritize my child's immunization appointments and make sure they are up-to-date with their vaccinations." This emphasizes the strong commitment of mothers in adhering to vaccination schedules and ensuring their children are protected from preventable diseases. Following closely is the statement "I believe that vaccination is a fundamental aspect of preventive healthcare and plays a crucial role in protecting my child and the community from infectious diseases," with a mean score of 3.64 and ranked 2, reflecting a deep understanding of the importance of vaccination among mothers in the community. Additionally, the proactive approach of mothers in scheduling and attending vaccination appointments for their children, even if it requires making arrangements in advance, is evident from the statement with a mean score of 3.60, ranked

3, and classified as Highly Complied. This proactive behavior indicates a strong sense of responsibility towards their children's health. Moreover, the active pursuit of information about vaccine preventable diseases and corresponding vaccines, as indicated by the statement with a mean score of 3.58, ranked 4, and classified as Highly Complied, demonstrates a commitment to staying informed and making informed decisions regarding their children's health. On the other hand, the statement with the lowest mean score of 3.37 and ranked 15, indicating Complied, is "I am aware of any government or community programs that provide free or subsidized vaccines for children in my area.

**Table 8.** Level of Compliance of Mothers on Vaccine Preventable Diseases at the Rural Health Units of the 5th District of Camarines Sur

| Indicators | Weighted Mean | Verbal Interpretation | Rank |
|---|---|---|---|
| 1. I ensure that my child receives all recommended vaccines according to the immunization schedule provided by healthcare professionals. | 3.51 | Highly Complied | 11.5 |
| 2. I actively seek out information about vaccine preventable diseases and their corresponding vaccines. | 3.58 | Highly Complied | 4.5 |
| 3. I prioritize my child's immunization appointments and make sure they are up-to-date with their vaccinations. | 3.55 | Highly Complied | 8 |
| 4. I understand the importance of completing the full course of vaccinations to ensure maximum protection against diseases. | 3.69 | Highly Complied | 1 |
| 5. I have easy access to healthcare facilities where my child can receive VPD immunizations. | 3.51 | Highly Complied | 11.5 |
| 6. I trust the advice and recommendations of healthcare providers regarding vaccination for my child. | 3.52 | Highly Complied | 10 |
| 7. I am aware of any potential side effects or risks associated with vaccines, but I still believe in their overall benefits for my child's health. | 3.56 | Highly Complied | 6.5 |
| 8. I communicate with healthcare professionals if I have any concerns or questions about my child's vaccinations. | 3.56 | Highly Complied | 6.5 |
| 9. I follow through with any additional doses or booster shots recommended by healthcare providers to maintain my child's immunity. | 3.50 | Highly Complied | 13 |
| 10. I keep track of my child's vaccination records and ensure they are updated during each healthcare visit. | 3.53 | Highly Complied | 9 |
| 11. I am aware of any government or community programs that provide free or subsidized vaccines for children in my area. | 3.37 | Complied | 15 |

| Indicators | Weighted Mean | Verbal Interpretation | Rank |
|---|---|---|---|
| 12. I prioritize my child's health and well-being by ensuring they receive timely vaccinations, even during busy or challenging times. | 3.58 | Highly Complied | 4.5 |
| 13. I discuss the importance of vaccination with other mothers and encourage them to prioritize their child's immunization. | 3.47 | Complied | 14 |
| 14. I am proactive in scheduling and attending vaccination appointments for my child, even if it requires making arrangements in advance. | 3.60 | Highly Complied | 3 |
| 15. I believe that vaccination is a fundamental aspect of preventive healthcare and plays a crucial role in protecting my child and the community from infectious diseases. | 3.64 | Highly Complied | 2 |
| **Average Weighted Mean** | **3.54** | **Highly Complied** | |

This suggests a potential area for improvement in raising awareness about available support programs for vaccination within the community. In conclusion, the data indicates a positive trend of maternal compliance and engagement with vaccination practices. While there are areas for improvement, such as increasing awareness of support programs, the overall commitment of mothers to prioritize their children's health through timely vaccinations is evident.

The research reveals a strong commitment from mothers to ensure their children receive timely vaccinations. This aligns with the findings of the study by Malabanan and Pacer in [16]. While the study focuses on a broader range of vaccine preventable diseases, the specific findings of their study provide valuable context for understanding the results. Both studies demonstrate a generally positive level of compliance among mothers. The study indicates "Highly Complied" scores for statements related to prioritizing appointments, understanding the importance of vaccination, and proactively scheduling appointments. Similarly, they found "complied" scores for pentavalent and rotavirus vaccines, suggesting a strong commitment to vaccination in the region. Both studies highlight a lack of awareness regarding government and community support programs for vaccination. The study identifies this as the statement with the lowest mean score, while they also emphasize the need for improved communication regarding available resources. The consistent findings across both studies suggest a positive trend of maternal engagement with vaccination programs. However, the persistent gap in awareness about support programs indicates a need for targeted interventions to improve access and utilization of these resources. Both studies emphasize the crucial role of information in

shaping mothers' decisions and behaviors regarding vaccination. The high levels of compliance in both studies suggest that mothers are receptive to information and education, but more proactive communication is needed to address gaps in knowledge and access to support programs.

The findings, coupled with Malabanan and Pacer's study, reinforce the need for robust communication strategies to ensure mothers are well-informed about vaccination schedules, the benefits of vaccination, and available support programs [16]. This could involve utilizing diverse communication channels, tailoring messages to specific audiences, and engaging community leaders to promote vaccination awareness. Both studies indirectly highlight potential barriers to vaccination, such as lack of awareness about support programs and limited access to information. Overall, the researches, provides a comprehensive picture of vaccination compliance. The findings highlight the importance of ongoing efforts to improve communication, address barriers to access, and ensure that mothers are well-informed and empowered to make informed decisions about their children's health.

## C. Factors Affecting the Level of Compliance of Mothers on Vaccine Preventable Diseases at the Rural Health Units of the 5th District of Camarines Sur

This portion shows the discussion and interpretation of the factors that affect level of compliance of mothers on vaccine preventable diseases immunization at the rural health units of the 5th District of Camarines Sur.

1. Access to Healthcare Services

Table 9 presents an evaluation of access to healthcare services for vaccine preventable diseases (VPD) immunizations in the study area. The data reveals important insights into the perceptions of respondents regarding the accessibility of healthcare facilities for immunization services. The statement "The rural health units (RHUs) in my area are conveniently located and accessible for me to avail VPD immunization services" garnered the highest mean score of 3.15 and is ranked 1, indicating that respondents generally agree that RHUs are conveniently situated. This suggests a positive perception of the proximity and accessibility of healthcare facilities for immunization services in the community. Following closely is the statement "I have easy access to transportation to reach healthcare facilities for my child's immunization appointments," with a mean score of 3.08 and ranked 2.

**Table 9.** Access to Health Care Services

| Indicators | Weighted Mean | Verbal Interpretation | Rank |
|---|---|---|---|
| 1. I have easy access to transportation to reach healthcare facilities for my child's immunization appointments. | 3.08 | Agree | 2 |
| 2. The rural health units (RHUs) in my area are conveniently located and accessible for me to avail VPD immunization services. | 3.15 | Agree | 1 |
| 3. I face challenges in accessing healthcare services due to long travel distances or lack of transportation options. | 2.65 | Agree | 5 |
| 4. Availability of healthcare professionals and resources at RHUs influences my ability to seek VPD immunizations for my child. | 3.00 | Agree | 3 |
| 5. I encounter barriers such as long wait times or overcrowded clinics when attempting to access VPD immunization services at healthcare facilities. | 2.86 | Agree | 4 |
| **Average Weighted Mean** | **2.95** | **Agree** | |

This reflects agreement among respondents regarding the ease of transportation access to healthcare facilities, highlighting the importance of transportation in facilitating timely immunization appointments for children. The statement "Availability of healthcare professionals and resources at RHUs influences my ability to seek VPD immunizations for my child" received a mean score of 3.00 and is ranked 3, indicating agreement on the significance of healthcare resources in facilitating access to immunizations. This underscores the importance of well-equipped healthcare facilities in promoting vaccination uptake. On the other hand, the statement "I encounter barriers such as long wait times or overcrowded clinics when attempting to access VPD immunization services at healthcare facilities" received a mean score of 2.86 and is ranked 4. While respondents agree on the accessibility of services, there is a higher level of concern regarding issues such as long wait times and overcrowded clinics, highlighting potential challenges in accessing timely immunization services. Lastly, the statement "I face challenges in accessing healthcare services due to long travel distances or lack of transportation options" received the lowest mean score of 2.65 and is ranked 5. This indicates agreement among respondents regarding travel and transportation challenges, suggesting that distance and transportation issues may pose barriers to accessing healthcare services for immunizations. Overall, the data indicates a general agreement among respondents on accessibility issues related to healthcare services for VPD immunizations. While there is a positive perception of

convenience and transportation access, concerns about wait times, overcrowded clinics, and travel challenges highlight areas that may require attention to ensure seamless access to essential immunization services for children in the community.

The findings presented in Table 9, which assess access to healthcare services for vaccine preventable diseases (VPD) immunizations, can be related to the study by [4]. This study provides valuable insights into the factors influencing mothers' decisions regarding their children's immunization. The study reveals a positive perception of the accessibility of healthcare facilities for immunizations, with respondents generally agreeing that RHUs is conveniently located and accessible. This aligns with the findings in Alicia, Isabela, where the study found that a majority of mothers (91.3%) go to government facilities to avail of immunization due to the free services and easy accessibility. However, both studies highlight challenges related to access. While respondents in the study acknowledged the ease of transportation, they also expressed concerns about long wait times and overcrowded clinics. Similarly, the study in Alicia, Isabela, although recognizing the positive aspects of accessibility, suggests that strengthening primary healthcare facilities is necessary to address issues concerning childhood vaccination. The findings suggest that access to healthcare facilities is a crucial factor in determining immunization uptake. The data indicates that while there is a general perception of accessibility, challenges such as wait times and overcrowding can hinder timely immunization services. The findings imply that improving the efficiency of immunization services, such as reducing wait times and addressing overcrowding, is essential to ensure seamless access and maintain high immunization rates. The data suggests that both communities may benefit from implementing strategies to address the challenges faced by mothers, such as offering flexible appointment scheduling or outreach programs. Both studies highlight the importance of accessibility and the challenges related to wait times and overcrowding. However, the study in Alicia, Isabela, specifically focuses on the knowledge, attitudes, and practices of mothers towards immunization. This suggests that the study in Alicia, Isabela, may provide a more comprehensive understanding of the factors influencing mothers' decisions regarding their children's immunization. The findings from both studies provide valuable insights into the factors influencing immunization uptake. While both communities have achieved relatively high immunization rates due to easy access to public health facilities, it is essential to address the challenges related to wait times, overcrowding, and the specific needs of mothers to further enhance the programs' effectiveness. The findings from the Alicia, Isabela study offer valuable

recommendations for improving immunization programs in both communities and ensuring seamless access to immunization services for all children.

2. Knowledge and Awareness

**Table 10.** Knowledge and Awareness

| Indicators | Weighted Mean | Verbal Interpretation | Rank |
|---|---|---|---|
| 1. I am aware of the importance of vaccines in preventing serious diseases and complications in children. | 3.50 | Highly Agree | 1.5 |
| 2. I understand the specific vaccines recommended for my child based on their age and health status. | 3.48 | Agree | 3 |
| 3. My knowledge about vaccines and immunization is influenced by information provided by healthcare professionals, media, and community sources. | 3.38 | Agree | 4 |
| 4. I am confident in my understanding of vaccine safety and efficacy, which motivates me to prioritize my child's immunization. | 3.50 | Highly Agree | 1.5 |
| 5. I actively seek out reliable information about vaccines and VPDs to make informed decisions about my child's health. | 3.37 | Agree | 5 |
| **Average Weighted Mean** | **3.45** | **Agree** | |

Table 10 presents the assessment of knowledge and awareness regarding vaccines. The statements with the highest means reflect a strong understanding and confidence in vaccine-related information. The statement "I am aware of the importance of vaccines in preventing serious diseases and complications in children" and "I am confident in my understanding of vaccine safety and efficacy, which motivates me to prioritize my child's immunization" both scored a mean of 3.50, ranking 1.5. This indicates a strong agreement on the significance and confidence in vaccines. Next, "I understand the specific vaccines recommended for my child based on their age and health status" scored a mean of 3.48, ranking 3, showing agreement with the knowledge of vaccine recommendations. The statement "My knowledge about vaccines and immunization is influenced by information provided by healthcare professionals, media, and community sources" scored a mean of 3.38, ranking 4, indicating agreement that multiple sources contribute to their knowledge. Lastly, "I actively seek out reliable

information about vaccines and VPDs to make informed decisions about my child's health" scored the lowest mean of 3.37, ranking 5, showing agreement but with a slightly lower level of active information-seeking. Overall, respondents generally exhibit a high level of awareness and confidence in vaccine-related matters, with varying degrees of proactive information-seeking.

The findings align with a study conducted in Malaysia that assessed parents' knowledge, awareness, and hesitancy regarding childhood immunization [6]. It was found that most parents possessed good knowledge and understanding of vaccines. Similarly, another study observed that parents were generally aware of the recommended immunization schedules for their children [5]. This is consistent with the results presented in Table 10, where respondents indicated that they understood the specific vaccines recommended for their children based on age and health status.

In addition, that study noted that parents relied on a variety of information sources—including healthcare professionals, media, and peer networks—to guide their vaccination decisions [5]. The current findings reflect the same pattern: respondents reported that their knowledge was shaped by similar sources, including health professionals and community media.

Although the Malaysian study did not explicitly assess the degree of proactive information-seeking, the current results suggest a possible gap. The statement "I actively seek out reliable information about vaccines and VPDs" received the lowest mean score in Table 10, suggesting a potential area for improvement. This echoes findings from the previous study, which noted that some parents lacked access to reliable vaccine information through local or national channels.

Overall, both the present and previous studies indicate that parents hold positive attitudes towards vaccines and acknowledge their importance. These findings reinforce the critical role of healthcare professionals in providing accessible, accurate, and trustworthy vaccine information. To address lingering hesitancy or uncertainty, healthcare providers must remain proactive in communicating with parents, answering questions, and correcting misinformation.

While most respondents showed strong knowledge and positive attitudes, it remains important to identify and address smaller pockets of vaccine hesitancy. The study in Malaysia found that a small percentage of parents still expressed concerns about vaccine safety and efficacy [6], underlining the need for continuous public health engagement and education.

### 3. Attitudes and Beliefs

The analysis of attitudes and beliefs toward vaccination is presented in Table 11, offering insights into the personal and social perspectives of mothers in the study area.

The highest-rated item, "I believe that vaccines are essential for protecting my child's health and preventing the spread of infectious diseases," achieved a strong mean score of 3.53 (ranked 1). This indicates a strong and widespread agreement among respondents about the core value of vaccines in promoting both individual and community health.

This is followed by the statement "I trust the scientific evidence supporting the safety and efficacy of vaccines, which positively influences my attitude towards immunization," with a mean score of 3.20 (ranked 2). These results demonstrate general confidence in science-based vaccine recommendations, which is a positive indicator for vaccine adherence.

The third-ranked statement, "I may have concerns or fears about vaccine side effects or adverse reactions that impact my decision to vaccinate my child," scored a mean of 2.88. This finding highlights that while trust exists, there are still underlying worries among some respondents, particularly related to safety and adverse effects.

Similarly, the fourth-ranked item, "My beliefs about vaccines may be influenced by misinformation or myths circulating within my community or social networks," received a mean of 2.87. This suggests that misinformation, especially through informal sources—continues to influence decision-making in some cases.

The final item, "My attitudes towards vaccines are influenced by cultural beliefs, personal experiences, and trust in healthcare providers," received a mean of 3.21 (ranked 5). While still scoring above average, this indicates that although cultural and personal factors play a role, they may be secondary to knowledge and trust in scientific information.

In summary, respondents displayed a strong consensus on the benefits and scientific validity of vaccines. However, concerns about side effects and the influence of misinformation still affect decision-making. These concerns must be addressed through well-targeted health education, culturally appropriate communication campaigns, and the reinforcement of trust between parents and healthcare providers. Doing so can further improve confidence and compliance in vaccination programs, particularly in rural and underserved communities.

**Table 11.** Attitudes and Beliefs

| Indicators | Weighted Mean | Verbal Interpretation | Rank |
|---|---|---|---|
| 1. I believe that vaccines are essential for protecting my child's health and preventing the spread of infectious diseases. | 3.53 | Highly Agree | 1 |
| 2. My attitudes towards vaccines are influenced by cultural beliefs, personal experiences, and trust in healthcare providers. | 3.21 | Agree | 5 |
| 3. I may have concerns or fears about vaccine side effects or adverse reactions that impact my decision to vaccinate my child. | 2.88 | Agree | 3 |
| 4. I trust the scientific evidence supporting the safety and efficacy of vaccines, which positively influences my attitude towards immunization. | 3.20 | Agree | 2 |
| 5. My beliefs about vaccines may be influenced by misinformation or myths circulating within my community or social networks. | 2.87 | Agree | 4 |
| **Average Weighted Mean** | **3.14** | **Agree** | |

The findings of this study regarding parental attitudes toward vaccines are in agreement with the study conducted by GebreEyesus et al. [8], which emphasized the recognition of the importance of vaccines, trust in scientific evidence, concerns over vaccine side effects, the impact of misinformation, and the role of cultural and personal factors. These parallel findings support the need for tailored education campaigns and proactive communication strategies. The study implies that strengthening trust in healthcare providers and promoting the dissemination of accurate, evidence-based vaccine information are essential actions to enhance vaccine acceptance. Recommended actions include implementing structured education efforts, engaging healthcare personnel as frontline communicators, and collaborating with local communities to improve immunization coverage and combat vaccine hesitancy.

4. Socio-Economic Aspect

In Table 12, the socio-economic aspects of the respondents are detailed. Upon examining the socio-economic factors affecting vaccination, it is evident that certain key statements stand out. The statement emphasizing the influence of "Education level

and employment status on awareness and understanding of vaccines and immunization practices" garnered the highest mean of 2.54 and secured the top ranking of 1, indicating a consensus of agreement that these factors significantly impact vaccine awareness and understanding. Closely following is the assertion that "Social support networks and community resources play a crucial role in mitigating socio-economic barriers to vaccination for families in need," with a mean of 2.72 and a ranking of 2.

**Table 12.** Socio-Economic Aspect

| Indicators | Weighted Mean | Verbal Interpretation | Rank |
|---|---|---|---|
| 1. My financial situation affects my ability to afford vaccination fees or related expenses for my child. | 2.35 | Moderately Agree | 4 |
| 2. I may face financial barriers such as lost wages or transportation costs when seeking VPD immunizations for my child. | 2.31 | Moderately Agree | 5 |
| 3. Socio-economic disparities within my community impact access to healthcare services, including immunization clinics. | 2.42 | Moderately Agree | 3 |
| 4. Education level and employment status may influence my awareness and understanding of vaccines and immunization practices. | 2.54 | Agree | 1 |
| 5. Social support networks and community resources play a role in mitigating socio-economic barriers to vaccination for families in need. | 2.72 | Agree | 2 |
| **Average Weighted Mean** | **2.47** | **Moderately Agree** | |

This finding reflects a collective agreement on the pivotal role of social support in overcoming barriers to vaccination, highlighting the importance Furthermore, the statement addressing "Socio-economic disparities within the community and their impact on access to healthcare services, including immunization clinics" obtained a mean of 2.42 and was ranked 3, indicating a moderate level of agreement with the influence of socio-economic disparities on healthcare access. In terms of financial considerations, the statement "My financial situation affects my ability to afford vaccination fees or related expenses for my child" received a mean of 2.35 and was ranked 4, signifying a moderate agreement with financial constraints affecting the

affordability of vaccinations. Lastly, the statement highlighting "Financial barriers such as lost wages or transportation costs when seeking VPD immunizations for my child" had the lowest mean of 2.31 and was ranked 5, indicating a moderate agreement with the financial challenges faced by parents when seeking vaccinations for their children. Overall, the data suggests a recognition of the influence of financial and socio-economic factors on vaccination access. While financial barriers are acknowledged, the impact of education and employment status, as well as the importance of social support networks and community resources, are perceived as more significant in enhancing vaccine uptake. This underscores the crucial role of education, employment, and community support in improving access to and acceptance of vaccinations among families.

The study of Taylor et al. [9] explores socio-cultural factors linked to incomplete routine immunization and provides insights that align with the findings of the research on socio-economic factors influencing vaccination. Both studies recognize the impact of education and employment status on vaccine awareness and access to healthcare services. Emphasis on the importance of social support and community resources in overcoming barriers to vaccination is shared between the studies. The influence of wealth level on incomplete immunization is highlighted, underscoring the impact of socioeconomic factors on vaccine uptake. Socioeconomic factors significantly affect vaccine uptake, necessitating targeted interventions. Quantitative data is used to demonstrate the relative importance of socioeconomic factors. Improving education, employment opportunities, and community support can address socioeconomic disparities in vaccination coverage. Multi-faceted approaches are needed to address the specific needs of disadvantaged communities for improved vaccine access and acceptance. Addressing socioeconomic inequalities in vaccination is crucial for public health. Education, employment, and social support are key determinants of vaccine uptake. Multi-faceted strategies are essential to enhance vaccine access and acceptance in disadvantaged communities. Both studies emphasize the intricate relationship between socioeconomic factors and vaccination rates, highlighting the importance of understanding and addressing disparities to ensure equitable access to essential vaccines.

**5. Cultural Influences**

Cultural values, traditions, and religious beliefs can shape parental perceptions and decisions about immunization. Understanding how these cultural influences

operate helps in developing culturally sensitive public health strategies. Table 13 provides insights into the cultural influences reported by the respondents regarding vaccination practices.

**Table 13.** Cultural Influences

| Indicators | Weighted Mean | Verbal Interpretation | Rank |
|---|---|---|---|
| 1. Cultural beliefs and traditions within my community influence perceptions of health, illness, and preventive practices like vaccination. | 2.61 | Agree | 1 |
| 2. Religious or spiritual beliefs may impact attitudes towards vaccines and medical interventions among community members. | 2.51 | Agree | 3 |
| 3. I may seek guidance from cultural or traditional healers in addition to or instead of seeking VPD immunization services. | 2.37 | Moderately Agree | 5 |
| 4. Cultural norms regarding child-rearing practices and healthcare decision-making influence my approach to vaccinating my child. | 2.54 | Agree | 2 |
| 5. Language barriers or cultural differences in communication styles may affect interactions with healthcare providers regarding vaccination. | 2.40 | Moderately Agree | 4 |
| **Average Weighted Mean** | **2.49** | **Moderately Agree** | |

The assessment of cultural influences reveals significant findings: - The statement emphasizing the impact of "Cultural beliefs and traditions within my community on health perceptions and preventive practices like vaccination" received the highest mean of 2.61 and was ranked 1, indicating a consensus of agreement on the influence of cultural beliefs on health practices. - Following closely, the assertion that "Cultural norms regarding child-rearing practices and healthcare decision-making influence vaccination approach" obtained a mean of 2.54 and was ranked 2, also demonstrating agreement with the impact of cultural norms on vaccination decisions. - The statement addressing how "Religious or spiritual beliefs may impact attitudes towards vaccines and medical interventions among community members" received a mean of 2.51 and was ranked 3, reflecting agreement that religious beliefs can shape attitudes towards vaccination. - The statement highlighting "Language barriers or cultural differences affecting interactions with healthcare providers regarding vaccination" had a mean of

2.40 and was ranked 4, indicating a moderate agreement on the impact of communication barriers. - Lastly, the statement acknowledging the potential of "Seeking guidance from cultural or traditional healers instead of seeking VPD immunization services" received the lowest mean of 2.37 and was ranked 5, indicating a moderate agreement with the possibility of consulting traditional healers over medical services. Overall, the data underscores the recognition of cultural and religious influences on vaccination perceptions and practices.

The research conducted by Dyda et al. [7] provides a valuable framework for understanding the cultural influences on vaccination attitudes and beliefs, aligning with the findings of your research. The study examined the methods used to measure parental attitudes and beliefs towards childhood vaccination. While the study's focus is on the tools used to measure these attitudes, it implicitly acknowledges the significant role of cultural factors in shaping vaccination decisions. The research findings, summarized in Table 13, demonstrate the strong influence of cultural beliefs, norms, and traditions on vaccination practices. The high mean scores and rankings for statements related to cultural beliefs, child-rearing practices, and religious beliefs highlight the importance of understanding these factors in promoting vaccination uptake. This aligns with the broader understanding that cultural context plays a crucial role in health behaviors and decision-making, as indicated by Dyda et al.'s review. While their review doesn't directly address the specific cultural influences identified in the research, it sheds light on the broader context of vaccine hesitancy and the need for culturally sensitive approaches to vaccination promotion. The review emphasizes the importance of using validated and standardized questionnaires to measure vaccine attitudes and beliefs, acknowledging the heterogeneity of approaches and the need for tools that can capture diverse cultural perspectives. The research findings reinforce the need for culturally tailored vaccination programs that address specific cultural beliefs, norms, and traditions. The high agreement on the influence of cultural beliefs and norms suggests a need for community-based interventions that engage with cultural leaders and influencers to promote vaccination. The moderate agreement on the impact of language barriers and reliance on traditional healers points to the importance of bridging communication gaps and integrating traditional practices into vaccination programs.

Cultural influences are a significant factor in shaping vaccination perceptions and practices. Culturally sensitive communication strategies, community engagement, and integration of traditional practices are essential for effective vaccination programs. Further research is needed to explore the specific cultural factors influencing

vaccination decisions in different communities and develop culturally tailored interventions to address vaccine hesitancy.

### 6. Healthcare System

Table 14 presents the healthcare system factors that may influence the compliance of respondents towards vaccination services. The evaluation of these factors reveals key insights:

**Table 14.** Healthcare System

| Indicators | Weighted Mean | Verbal Interpretation | Rank |
|---|---|---|---|
| 1. The availability of trained healthcare professionals at rural health units (RHUs) influences my confidence in the quality of VPD immunization services provided. | 3.39 | Agree | 5 |
| 2. Adequate infrastructure and equipment at RHUs, such as refrigeration for vaccine storage, ensure the effectiveness and safety of vaccines. | 3.53 | Highly Agree | 1 |
| 3. The organization and efficiency of immunization clinics at RHUs impact my experience and satisfaction with the vaccination process. | 3.42 | Agree | 4 |
| 4. Government policies and regulations regarding vaccine procurement, distribution, and administration affect the accessibility and affordability of VPD immunization services. | 3.43 | Agree | 3 |
| 5. Collaboration and coordination between RHUs, Barangay Health Stations (BHS), and other healthcare facilities contribute to a seamless and integrated approach to immunization within the healthcare system. | 3.49 | Agree | 2 |
| **Average Weighted Mean** | **3.45** | **Agree** | |

The highest-rated statement, "Proper infrastructure such as refrigeration for vaccine storage is essential," received a mean of 3.53 (ranked 1), indicating strong agreement on the importance of infrastructure in maintaining vaccine safety and effectiveness. Following closely, the statement regarding "Collaboration among healthcare facilities to promote an integrated approach to immunization" had a mean of 3.49 (ranked 2), reflecting agreement on the value of inter-facility coordination.

Further, "Government policies that support vaccine accessibility and affordability" received a mean of 3.43 (ranked 3), indicating that respondents recognize the influence of policy on service accessibility. The organization and efficiency of immunization clinics scored a mean of 3.42 (ranked 4), while the "Availability of trained healthcare professionals at RHUs" received a mean of 3.39 (ranked 5).

Overall, the data underscores the critical role of systemic healthcare elements—particularly infrastructure and policy—in supporting immunization programs. Though all five aspects received high mean scores, infrastructure and coordinated healthcare delivery were perceived as most influential.

These findings are consistent with the work of Cooper et al. [17], who emphasized that parents' vaccination behaviors are significantly influenced by their access to vaccination services and experiences with frontline healthcare workers. Similarly, Balgovind and Mohammadnezhad [18] identified numerous systemic challenges, including limited knowledge, logistical barriers (such as transportation and childcare), and institutional inefficiencies like long wait times and inconvenient clinic hours. Both studies reinforce the importance of supportive healthcare systems and informed, responsive healthcare workers in overcoming barriers to immunization.

### D. Determinants of Compliance of Mothers on Vaccine Preventable Diseases Immunization at the Rural Health Units of the 5th District of Camarines Sur

The researcher employed Multiple Logistics Regressions to identify the determinants of maternal compliance with vaccine preventable diseases (VPD) immunization. Table 15 elucidated the determinants of compliance levels with VPD immunization, revealing that religion and family monthly income emerged as significant factors with substantial effects.

The calculated t-test for religion yielded a value of 2.020 with a p-value of 0.045, leading to the rejection of the null hypothesis and underscoring religion as a significant predictor of compliance. Similarly, the t-test for family monthly income resulted in a value of 2.070 with a p-value of 0.040, further rejecting the null hypothesis and highlighting the significant impact of family income on compliance. Conversely, demographic and socio-economic variables such as age, civil status, number of children, educational attainment, and occupation exhibited p-values exceeding 0.05, indicating the acceptance of the null hypothesis for these factors. This suggests that these variables do not play a substantial role in determining compliance with VPD immunization in the study.

In summary, while religion and family income exert significant influences on compliance, other demographic and socio-economic factors do not demonstrate a noteworthy effect on vaccination adherence in this research.

**Table 15.** Determinants of Compliance of Mothers on Vaccine Preventable Diseases Immunization at the Rural Health Units of the 5th District of Camarines Sur

| Indicators | Computed T- test | P - Value | Decision | Interpretation |
|---|---|---|---|---|
| Age | 0.565 | 0.573 | Accept | Not Significant |
| Civil Status | -1.695 | 0.092 | Accept | Not Significant |
| Religion | 2.020 | 0.045 | Reject | Significant |
| Number of Children | 0.664 | 0.507 | Accept | Not Significant |
| Educational Attainment | -0.110 | 0.913 | Accept | Not Significant |
| Occupation | -1.555 | 0.122 | Accept | Not Significant |
| Family Monthly Income | 2.070 | 0.040 | Reject | Significant |

The determinants of compliance of mothers with VPD immunization resonate with a study of Sabahelzain et al. [10] on vaccine hesitancy among parents. While statistical analysis did not find a significant overall association between maternal education and family income and measles vaccine uptake, our study revealed notable trends.

Children of mothers with no formal education were twice as likely to be either partially or completely unvaccinated compared to children of mothers with university degrees. Similarly, families with low incomes had more than double the proportion of partially or completely unvaccinated children compared to high-income families. These findings suggest a potential link between lower socioeconomic status and lower measles vaccination rates.

## Conclusion

Based on the findings of this study on maternal compliance with vaccine-preventable diseases (VPD) immunization at the Rural Health Units of the 5th District of Camarines Sur, it can be concluded that the majority of respondents were women aged 26–33 years old, predominantly married, Roman Catholic, high school graduates, unemployed, and with a family monthly income between 5,000 to 15,000 pesos.

The overall level of compliance was found to be high, as evidenced by strong adherence to immunization schedules and a clear understanding of the importance of vaccination. Nonetheless, areas for improvement remain, particularly in terms of increasing awareness of government and community programs and enhancing peer-level engagement. While trust in

vaccination and knowledge about its benefits were generally strong, concerns related to vaccine side effects and financial challenges still influenced behavior in some cases.

The statistical analysis further revealed that religion and family income were significant predictors of compliance, suggesting that these socio-cultural and economic factors play a crucial role in shaping mothers' decisions about childhood immunization. Other demographic variables, such as age and educational attainment, were not found to be statistically significant, indicating that belief systems and financial capacity may have a stronger impact on vaccination adherence than basic demographic characteristics.

These insights highlight the importance of tailoring immunization strategies to address both cultural and economic barriers, especially in rural and underserved communities.

## Conflict of Interest

The authors declare that there is no conflict of interest in the conduct and reporting of this study.

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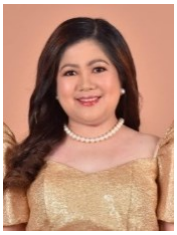
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