

RISK COMMUNICATION INFORMATION AND COMPLIANCE: CHILD VACCINATION AND PREVENTION OF DISEASES AMONG REGISTERED LACTATING MOTHERS IN THE SOUTH EAST

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Abstract

Child vaccination forms the bedrock of warding off some diseases which could lead to infant mortality. The purpose of this study was to look at risk communication information and compliance in regard to child vaccination and prevention of diseases among lactating mothers in south east Nigeria. For the purpose of this study, health belief model was used to explain the engagement or lack of engagement in health promoting behavior. The survey design was used to carry out this study; 390 copies of the questionnaire containing a 17 question items was used. The data collected was analyzed using the Statistical Package for Social Sciences (SPSS) and presented using simple frequency tables and Pie Chart. Results indicate that most lactating mothers are aware of the risk of not vaccinating a child but they rarely comply with the prompting to vaccinate their children.

Key words: Child vaccination, risk communication, lactating mothers, compliance

INTRODUCTION

Communication lies at the 'heart of public health and plays a pivotal role in promoting core public health objectives...including disease prevention, health promotion and quality of life'. Effective risk communication is increasingly seen as crucial to the prevention and cooperative management of health risks; indeed. It enables people to participate in deciding how risks should be managed.

With the emergence of diseases and re-emergence of those diseases thought eradicated, there is need for timely risk communication information and vaccination of children to prevent diseases that could lead to high mortality rate. Despite advances in sanitation and immunization initiatives, infectious diseases remain a significant cause of mortality and morbidity worldwide. In low and middle income countries; especially, infections rank among the top ten leading causes of mortality. The effect is particularly devastating among communities with low vaccination coverage.

The World Health Organization (WHO) estimates that 1.5 million deaths among children under 5 years were due to vaccine-preventable diseases (VPDs), representing 17 per cent of under-five child mortality worldwide. It is to this regard that this study seeks to unravel the level of compliance of child vaccination among lactating mothers.

BACKGROUND OF THE STUDY

The health of the people is the foundation upon which all their happiness depend. On may 14, 1769, Edward Jenner, a British physician, performed an experiment that would revolutionize public health .He made two small cuts on the arm of an eight – year- old boy, James Phipps, and inserted material taken from a sore on a woman infected with cowpox, a mild diseases common to daily workers. Six weeks later, Jenner injected the boy with fluid from a smallpox lesion, and James did not contract smallpox. With the experiment, Jenner discovered that inoculation of a person with relatively harmless disease material could protect the person from a more dangerous disease. He called this process "Vaccination" derived from the Latin name of cowpox vaccine.

Vaccination is the most effective tool which greatly prevent and reduce incidence and severity of seven common diseases including Whooping cough, Diphtheria, Tetanus, Hepatitis B, Tuberculosis, Poliomyelitis, Measles, which are together responsible as leading causes of all death in children under age of five. Moreover, vaccination is recognized as one of most powerful and cost effective prevention measures against diseases.

Vaccination is considered to be one of the greatest achievements of public health. It has greatly reduced the mortality and morbidity of various infectious diseases (10). WHO estimates that immunization saves more than 2.5 million lives worldwide each year (2011/2012). Thus, maintaining high vaccination coverage is necessary in order to control vaccine-preventable diseases. Vaccines are safe, simple and one of the most cost-effective ways to save and improve the lives of children worldwide. However, many children in developing countries lack access to vaccines often because they live in hard-to-reach communities and are among the most marginalized members of the community. Children in Nigeria continue to lose their lives to vaccine-preventable diseases such as measles, which remains the bigger killer. Diarrhea remains the second major cause of death among

children, after respiratory-tract infections. Unhygienic practices and unsafe drinking water are some of its main causes.

According to Omer, Salmon, Orenstein, deHart, & Halsey (2009), Vaccines are among the most cost-effective and successful public health treatments available for preventing diseases and death. The timely delivery of childhood vaccinations helps to increase protection from vaccine preventable diseases while minimizing risks to the child and decreasing the chance of outbreaks of the disease (Agency for Healthcare Research & Quality, 2006).

Although the current rates of vaccine preventable diseases are at or near record low, the protection of Nigerian children and adults remains a national priority. Despite progress, there still exists a high rate of death among children. The Centers for Disease Control and Prevention (2009) recommends obtaining maximum immunization coverage, establishing effective partnerships, conducting reliable scientific research, implementing immunization systems, and ensuring continued vaccination safety.

When the childhood vaccination schedule is not followed as recommended, the child not only will fail to receive timely protection from vaccine preventable diseases at the time when they are most susceptible, but also are at an increased risk of never completing the full vaccination series (Guerra, 2007). Because most children depend on their parents to be in charge of their health care, it is likely that parental health literacy may also influence child health outcomes (Pati et al., 2010).

The study sought answers to the following questions:

- 1) Who among lactating mothers in Anambra State is aware of the risk associated with non vaccination of children?
- 2) To what extent do lactating mothers comply with risk communication information on child vaccination and prevention of diseases?
- 3) What is the relationship between child vaccination and prevention of diseases?
- 4) Does risk communication information influences lactating mothers' decision on child vaccination?

DEFINITION OF RISK COMMUNICATION

Risk communication refers to an exchange of information about the health risks caused by environmental, industrial, or agricultural processes, policies, or products among individuals, groups and institutions. Risk communication is a dynamic and interactive process involving exchanges between different groups of key players and audiences. Covello & Sandman (1991) remark that the principle of involving the public in matters of risk, whether it is risk assessment, decision making, management or communication, marks one of the crucial distinctions of risk communication in theory and practice from a larger literature on crisis communication. It is based on ongoing projections and calculations of the potential for future harm. Risk messages, emerge long before a crisis event occurs, and aim to reduce the likelihood of a crisis event occurring in the long term.

Risk communication is any purposeful exchange of information about risks between interested parties. More specifically in the context of this work, risk communication is the act of conveying or transmitting information between parties about a range of areas including: child vaccination as a means of preventing diseases.

According to Covello & Sandman (1991) industries and governments historically ignored the public in matters of risk and crisis, their aim being to protect the public, rather than involve it. As risk communication emerged as a body of theory and practice of its own, the public has played an increasingly important role in the management of risk issues and implementation and monitoring of risk management decisions. Today, there appears to be wide acceptance in the literature that effective and responsible risk communication encourages working relationships amongst all interested parties, including the public.

Other definitions emphasize the importance of risk management (McComas, 2006), the need for dialogue between communicators and stakeholders (Palenchar, 2005), and the necessity of ongoing risk monitoring (Coombs, 2012). Organized and centralized risk communication efforts grew out of legal and regulatory mechanisms regarding community right to know, enforced by the U. S. Congress and state and local governments, that required organizations or institutions (specifically in chemical and manufacturing fields) to inform people of any potential consequences of their existence (Palenchar, 2008).

The significance or meaning of health or environmental risks decisions, actions or policies aimed at managing or controlling health or environmental risks. Interested parties include government, agencies, corporations and industry groups, unions, the media, scientists, professional organisations, interested groups, and individual citizens (Covello et al.1991). Initial studies building on health risk research by Covello, Paustenbach, Detlofvon Winterfeldt and Slovic, amongst others Nicoll & Murray and Reynolds & Seeger (1991) suggest that risk communication was embraced in the field of public health as threats to health from Effective risk communication for the prevention and control of communicable diseases in Europe. In an era characterized by uncertainty, rapid change and globalization, where national borders provide no barriers to the transmission of communicable diseases, and with new diseases emerging and the re-emergence of other diseases, the importance of models and guidelines for effective risk communication is clear.

Bennett (1999) holds that public reactions to risk often have a rationality of their own, and that 'expert' and 'lay' perspectives should inform each other as part of a two-way process. The necessity of the two-way process has been highlighted by the FAO/WHO.

Risk communication is more than the dissemination of information, and a major function is the process by which information and opinion essential to effective risk management is incorporated into the decision (Bennett & Calman 1999). The days when it was possible to take a 'we know best' approach, simply informing the public that a risk has been identified, telling people not to worry, and stating what was intended to do about it, have in most cases long gone (Coles 1999).

The public today no longer automatically acquiesce to authority and now demand a greater role in decision-making (McKechnie and Davies 1999). This, while opening up a route for better decision-making and stakeholder involvement, is no small undertaking and involves some major challenges (McCallum and Anderson 1991), including:

- Provision of information when science is uncertain.
- Explanation of the risk assessment process.
- Incorporation of the differing ways that various groups interpret the science into risk communication strategies.
- Accounting for differing concepts of an 'acceptable' level of risk.
- Provision of information that assists in personal decisions and informs opinions on policy.

- In terms of incident management, maximizing appropriate public responses and minimizing inappropriate public responses

Effective risk communication is increasingly seen as crucial to the prevention and cooperative management of health risks; indeed, communication expertise has been recognized as at least equally essential to outbreak control as epidemiological training and laboratory analysis. The overall aim of risk communication is to provide the public with meaningful, relevant, accurate and timely information in relation to health risks in order to influence choice. In the context of vaccine preventable diseases, particularly in the highly tense situations these diseases engender (for example outbreak scenarios), effective risk communication is a complicated and challenging process.

Risk communication specialist Vincent T.Covello, and his colleagues highlight that the usual rules of communication often fall short or can make the situation worse. Glik (1996) argues that people face potential disasters such as pandemic flu or other serious health threats, being able to communicate appropriately to the news media and to the public, although never assured, can be more closely approximated if basic principles of practice are followed.

HEALTH RISK COMMUNICATION

Health risk communication has traditionally consisted of messages designed to encourage behavior that reduces individual and societal risk (e.g., smoking cessation and seat-belt use). Increasingly, risk communication, including health risk communication, is seen as an interactive process of an exchange of information and opinion among individuals, groups, and institutions (National Research Council, 1989). To be effective, risk communications must address the experiences, beliefs, values, and attitudes of message recipients as well as providers. Understanding how risks are perceived and the inherent biases of both message providers and recipients are key to good risk communication.

Although health risk communication has been an active research area for several decades, the science and practice of vaccine risk communication are not yet well developed. Many of the problems with risk communication in general, however, apply to vaccine risks. In particular, the rarity of vaccine-preventable diseases in the vaccine era makes it more difficult to communicate the risks of these diseases. Recent studies illustrate specific factors influencing how vaccine risks and benefits are perceived by and acted on by consumers and vaccine providers. Individual's immunization decisions are influenced by decisions that others make. People might prefer to do what a majority of others do or may take advantage of the protection afforded by high immunization rates and not be vaccinated; they may also be influenced to vaccinate by the fact that vaccination would protect others. Other factors include perceptions of disease risk and the ability to control those risks, and preferences for the risks of diseases per se over

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RISK CHARACTERISTICS

Effective risk communication efforts must be adapted to match the type of risk. A significant communication challenge is informing the public of lower familiarity/higher dread risk events. International risks like terrorism are a particularly complex hazard for individuals and publics to interpret, respond to, and prepare for as they involve the intentions of other people, and those are often hard to understand (Rogers et al., 2007). Effects of these risks are more observable, easier to understand, and shorter term. Further, it is possible to provide warnings for these risks, making the public more likely to respond (Mileti & Sorensen, 1990; Slovic, 2000). At the same time, however, these risks contain dread attributes of being involuntary and having the potential to cause fatalities.

From the risk manager's perspective, the purpose of risk communication is to help residents of affected communities understand the processes of risk assessment and management, to form scientifically valid perceptions of the likely hazards, and to participate in making decisions about how risk should be managed. Risk communication tools are written, verbal, or visual statements containing information about risk.

They should put a particular risk in context, possibly add comparisons with other risks, include advice about risk reduction behaviour, and encourage a dialogue between the sender and receiver of the message. The best risk communication occurs in contexts where the participants are informed, the process is fair, and the participants are free and able to solve whatever communication difficulties arise. Ideally, risk communication is a two-way conversation in which an agency or organization informs, and is informed by, affected community members.

IMPORTANCE OF RISK COMMUNICATION

Risk Communication is an important tool for disseminating information and understanding about a risk management decision. This understanding and information should allow stakeholders to make an informed conclusion about how the decision will impact their interests and values.

Risk communication is useful in the following situations:

- explaining the chance of a risk impact (probability) and the predictability of the risk impact (stochastic);
- outlining the difference between risk (dependent on scenarios) and hazard (found within a specific area);
- dealing with fears and uncertainties around POPs related illnesses;
- dealing with any long-term effects from the risk and risk management;
- improving the overall understanding of risk based terminology and concepts;
- delivering an understanding of how risk management decisions will impact lifestyles;
- creating a venue where uncertainties can be addressed and questions answered;
- improving the transparency and credibility of those implementing the risk management;
- dealing with conflicting interests and cultures of the various interested and affected parties

MEANING OF VACCINATION

Vaccination is simply the injection of a killed microbe in order to stimulate the immune system against the microbe, thereby preventing disease. Vaccinations, or immunizations, work by stimulating the immune system, the natural disease-fighting system of the body. The healthy immune system is able to recognize invading bacteria and viruses and produce substances (antibodies) to destroy or disable them. Immunizations prepare the immune system to ward off a disease. (www.medicinenet.com).

Most times, the term vaccination is used interchangeably with immunization but they differ in some ways. According to Dorland's medical dictionary, vaccination means to inject a suspension of attenuated or killed microorganism administered for prevention or treatment of infectious disease. Vaccines contain a dead or alive weakened germ that can cause a particular disease, like tetanus, or parts of a germ. When we are given a vaccine shot, our body immediately produces antibodies against the germ. It is at this point that most believe the body's defence mechanism kicks in and immunity will occur in the event that the said antigen gains entry again into the body but, this is not the case with all vaccines. (<http://sanevax.org>)

Vaccines are widely recognized by health authorities and the medical community as a major tool for achieving public health successes such as the eradication of smallpox (Andre et al., 2008 and ECDC, 2012). Yet, for many individuals, this is not a sufficient basis with which to embrace vaccination whole-heartedly. They are not fully informed about vaccines, doubt the benefits of vaccines or worry over their safety and question the need for them. The policy concern is that hesitancy soon becomes refusal, as suggested by theory and experience (Salathé and Bonhoeffer, 2008), and unvaccinated clusters emerge in which disease outbreaks can occur (Gangarosa et al., 1998 and Jansen et al., 2003).

For example, a UK study of 14,578 children found that three-quarters of parents whose children were not vaccinated with MMR made a conscious decision to not vaccinate (Pearce et al., 2008). The refusal rate suggests that the traditional assumption that parents suffer information deficit, lack access to the facts or are misinformed, at best, an incomplete understanding of vaccination attitudes (Hobson-West, 2003).

The goal of maintaining high coverage rates helps to ensure vaccination benefits are delivered widely, but the very act of delivering wide scale vaccination can make vaccines 'victims of their own success'. As the ravages of disease become less familiar to people, it may become more challenging to articulate the desirability of vaccination. Nichter (1995: p 617, 625) distinguished between '*active demand*' (an appreciation of the benefits of and the need for vaccination) and '*passive acceptance*' (vaccination denoting compliance or yielding to power). Nichter (1995: p 625) pointed out that "demand is often low, even among populations having impressive immunisation rates". When hesitancy is prevalent, ensuring compliance and high coverage rates may not be enough to ensure that vaccination is sustainable in the future (Roalkvam et al., 2013: p 192).

Hak et al., 2005 assert that educated people are likely to reject vaccination more readily than the less educated (who accept passively).

For scholars such as Hobson-West (2003), public health authorities issuing vaccination recommendations struggle to resonate with a general public who are now more enamored

with notions of individual empowerment and exercising patient-choice. What follows then is a review with an agenda that centres on attitudes to vaccination, and one that seeks to determine whether vaccine hesitancy is a prevalent phenomenon, what the reasons are for hesitancy, and what might constitute a basis for cultivating active demand. A number of recent reviews cover attitudes to vaccination.

RELEVANCE OF VACCINES

Vaccinations are an essential tool in our fight against infectious disease. According to the World Health Organization (WHO), vaccination has greatly reduced the burden of infectious disease globally.

Vaccines protect the vaccinated individual by direct immunization and can protect unvaccinated individuals through community protection or herd immunity. Vaccination has also been highlighted as one of the main reasons for the fall in health disparities both within and across countries in the last century. It was recently estimated that since 1924, vaccinations have prevented 103 million cases of childhood infection, representing approximately 95 percent of infections that would have occurred, including 26 million in the last decade alone. The Centre for Disease Control and prevention now advocates the use of vaccines as a tool for addressing antimicrobial resistance. Vaccines has dramatically reduced the threat of diseases that were once widespread and oftentimes fatal. World health organization holds that today, more people benefit from safe and effective vaccines than ever before. Vaccines help reduce health care costs to both patients and the broader health care system by reducing the incidence of vaccine-preventable illness.

In 2010, an estimated 109 million children under the age of 1 were vaccinated with three doses of diphtheria-tetanus-pertussis (DTP3) vaccine worldwide. These children are protected against these infectious diseases that can have serious consequences like illness, disability, or death.

Vaccination has greatly reduced the burden of infectious diseases. Only clean water, also considered to be a basic human right, performs better. Paradoxically, a vociferous antivaccine lobby thrives today in spite of the undeniable success of vaccination programmes against formerly fearsome diseases that are now rare in developed countries. Understandably, vaccine safety gets more public attention than vaccination effectiveness, but independent experts and WHO have shown that vaccines are far safer than therapeutic medicines. Modern research has spurred the development of less reactogenic products, such as acellular pertussis vaccines and rabies vaccines produced in cell culture. Today, vaccines have an excellent safety record and most "vaccine scares" have been shown to be false alarms. Efficacious vaccines protect individuals if administered before exposure. Pre-exposure vaccination of infants with several antigens is the cornerstone of successful immunization programmes against a cluster of childhood diseases. Vaccine efficacy against invasive Hib disease of more than 90% was demonstrated in European, Native American, Chilean and African children in large clinical studies in the 1990s.

THE HEALTH BELIEF MODEL

The health belief model (HBM) is the most commonly used theory in health education and health promotion (Glanz, Rimer and Lewis, 2002; National Cancer Institute, 2003). It is a psychological health behavior change model developed to explain and predict health related behaviours. The health belief model was developed in the 1950s by social psychologists;

Irwin Rosenstock, Godfrey Hochbaum, Stephen Kegeles and Howard Leventhal at the United States Public Health Service. It suggests that people's beliefs about health problems, perceived benefits of action and barriers to action and self efficacy explain engagement or lack of engagement in health promoting behavior. This model has been applied to predict a wide variety of health-related behaviours.

Researchers create and implement interventions as a major means by which to disseminate knowledge and increase awareness about a given health problem, such as child vaccination. Interventions that yield desirable changes are ideally based on at least one theoretical framework (Glanz, Rimer, & Lewis, 2002). Health-behavior theories assist researchers by organizing their inquiry into why people do or do not engage in specific health behaviors (NCI, 48, 2005). Health Belief Model is an example of a health behavior theory that considers one's overall perceived risk of an illness as a precursor to positive, preventive behavior (Wendt, 2005; Janz & Becker, 1984; Weinstein & Sandman, 1992).

Perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action comprised the initial core components of the model. But in 1977, Bandura added the self-efficacy component to the health belief model (Janz, Champion, & Strecher, 2002). This theory is known as a value-expectancy theory and the most widely used model for health related issues. This model states that an individual's desire to evade illness, coupled with a belief that a particular health action would avert onset of the illness, can be interpreted and explained in relation to a number of diseases.

Thus, when women realize that their non compliance in child vaccination can result in dire consequences, they can as a result of the negative consequences, change their behaviour towards practicing every stipulated guideline. But this theory suggests that with the fear of the outcome of a disease, most women will start vaccinating their children.

METHODOLOGY

This study was designed as a survey. The survey questions were in regard to the respondents' awareness and compliance to risk communication on child vaccination. These questions were designed to unravel whether lactating mothers are even aware of the risk involved in not vaccinating their children and also to know their level of compliance to these risk communication information. The population for this study comprises all registered lactating mothers for vaccination in three selected hospitals in each capital city of south eastern states in Nigeria. This is because mothers are mostly believed to take decisions on child vaccination or immunization. This is also evident in various hospitals where they normally gather for vaccination. For the purpose of evenness and balance, one federal hospital, one state hospital and one private hospital were selected in each state capital.

In Enugu state, three hospitals selected were University of Nigeria Teaching Hospital Enugu with 2,000 registered lactating mothers, ESUT Teaching Hospital (1,500) and Annunciation Specialist Hospital Enugu with 600 registered lactating mothers for vaccination.

In Abakaliki, state capital of Ebonyi, the hospitals selected are federal teaching hospital Abakaliki (1000), Ebonyi state specialist hospital, Abakaliki (1000) and Mile 4 hospital Abakaliki(500).

In Imo state (Owerri), three hospitals selected are federal medical centre (2,000), Imo specialist hospital, Umuguma, Owerri (1000) and Umezuruike hospital Owerri (1000).

In Awka, two hospitals were selected due to the non existence of a federal hospital in the state capital. Regina Ceali hospital and maternity (600), Anambra State University Teaching Hospital Awka (1000) .

Federal Medical Centre Umuahia(2000), Specialist Hospital Abia State (1,500) and Uchenna maternity hospital (500).These figures were obtained from the public health department in the above listed hospitals and shows the number of registered lactating mothers for child vaccination from January till date.

Enugu has a total number of 4,100, Abakaliki- 2,500, Owerri -4,000, Awka-1,600 and Umuahia-4,000. Therefore the population for this study is 16,200. A sample of 396 was drawn from the study population of 16,200. This sample had been arrived at using Taro Yamane's formula for determining sample size. $N/(1+N [e]^2)$

A simple random sampling procedure was used to select respondents from the study population of 16,200. A pre-coded 17-item questionnaire was used as the data collection instrument in which items addressed variables directly related to research questions that have been developed for this study. The questionnaire was structured with closed ended questions to elicit the needed response from the respondents.

RESULTS

A total of 390 copies of the questionnaire were distributed. These copies were shared bearing in mind the numerical strength of the fourteen hospitals that were randomly selected.

Demographic Variables

The respondents' demographic variables were measured using question items 1-4 in the questionnaire (see Appendix A). Data generated from their responses were presented in the following tables

Table 1: *Respondents age*

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 18-25	109	29.5	29.5	29.5
26-33	172	46.5	46.5	75.9
34 and above	89	24.1	24.1	100.0
Total	370	100.0	100.0	

As shown in table 1, the respondents within the 18-25 age brackets were predominant at 29.5 percent. They were closely followed by respondents who are 34 and above at 24.1 percent. Those 26-33 age brackets made up 46.5 percent of the respondents.

Table 2: *Respondents marital status*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	44	11.9	11.9	11.9
	Married	305	82.4	82.4	94.3
	Divorced	21	5.7	5.7	100.0
	Total	370	100.0	100.0	

The analysis in table two shows that a greater number of the respondents, 82.4 percent are married, 11.9 percent are single while 5.7 percent of the respondents are divorced.

Table 3: *Respondents occupation*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	civil servant	68	18.4	18.4	18.4
	business woman	112	30.3	30.3	48.6
	Housewife	56	15.1	15.1	63.8
	Student	73	19.7	19.7	83.5
	job seeker	61	16.5	16.5	100.0
	Total	370	100.0	100.0	

As shown in table 3, the respondents who are business women were predominant at 30.3 percent, more than any other kind of occupation. They were closely followed by respondents who are students at 19.7 percent. Respondents who are civil servants were predominantly at 18.4 percent, followed by respondents who are job seekers at 16.5 percent. Those who are housewives made up 15.1 percent of the respondents.

Table 4: *Respondents number of children*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	One	87	23.5	23.5	23.5
	Two	131	35.4	35.4	58.9
	more than two	152	41.1	41.1	100.0
	Total	370	100.0	100.0	

Table 4 shows that a greater number of the respondents, 41.1 percent, have more than three children, while 35.4 percent have two children. 23.5 percent of the respondents have one child.

Awareness of risk communication on child vaccination and prevention of diseases

In this section the primary goal was to determine the awareness of risk communication on child vaccination and prevention of diseases among the respondents. And the questions on this issue were measured using question items 5-10 in the questionnaire. The data generated are as presented below.

Table 5: *Respondents who know about vaccines*

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	202	54.6	54.6
	No	29	7.8	62.4
	not really	139	37.6	100.0
	Total	370	100.0	

The analysis in Table 5 shows that about 54.6 percent of the respondents have knowledge of vaccines, while 37.6 percent of the respondents do not really know about vaccines. Also, 7.8 percent of the respondents do not know about vaccines.

Table 6: *Respondents knowledge of vaccines*

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Hib	35	9.5	9.5
	Pcv	23	6.2	15.7
	chicken pox	17	4.6	20.3
	Rotarix	34	9.2	29.5
	Bcg	29	7.8	37.3
	Synflorix	11	3.0	40.3
	Tetanus	111	30.0	70.3
	1 2 3 4 and 7	42	11.4	81.6
	dont know	68	18.4	100.0
	Total	370	100.0	

Table 6 indicates that about 30 percent of the respondents know about vaccine for tetanus, while 18.4 percent of the respondents do not have knowledge of a particular vaccine. Also, 11.4 percent of the respondents know about hib, pcv, chicken pox, rotarix and tetanus vaccines while 9.5 percent know about Hib vaccine. Along this same line about 9.2 percent of the respondents have knowledge of rotarix vaccine while 7.8 percent of the respondents know about bcg vaccine. It is clear from these data that more of the respondents own internet-enabled phones. 6.2 percent of the respondents have knowledge of pcv, 4.6 for chicken pox and 3.0 for synflorix this shows that a greater number of the respondents know more about tetanus vaccine more than others

Table 7: *Respondents who have heard of child vaccination*

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	318	85.9	85.9	85.9
No	52	14.1	14.1	100.0
Total	370	100.0	100.0	

Table 7 indicates that a greater number of the respondents 85.9 percent, have heard of child vaccination while 14.1 percent of the respondents have not.

Table 8: *Respondents means of information*

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid healthcare professionals	139	37.6	37.6	37.6
mass media	67	18.1	18.1	55.7
Friends and relations	112	30.3	30.3	85.9
Don't know	52	14.1	14.1	100.0
Total	370	100.0	100.0	

Table 8 shows that about 37.6 percent of the respondents got their information about child vaccination from healthcare professionals, 18.1 got theirs' from the mass media, 30.3 also got theirs from friends and relations while 14.1 do not know where they got information about child vaccination. This shows that a majority of the respondents got information from healthcare professionals who are knowledgeable about the issue of discussion.

Table 9 : *Respondents who know the risk of not vaccinating a child*

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	204	55.1	55.1	55.1
No	166	44.9	44.9	100.0
Total	370	100.0	100.0	

Table 9 shows that a greater number of the respondents, 55.1 percent know the risk of not vaccinating a child while 44.9 percent of the respondents equally know the risk of not vaccinating a child.

Table 10: *How often respondents get information on child vaccination and prevention of diseases*

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Regularly	44	11.9	11.9	11.9
Occasionally	203	54.9	54.9	66.8
don't know	81	21.9	21.9	88.6
Rarely	42	11.4	11.4	100.0
Total	370	100.0	100.0	

The analysis in Table 10 reveals that 54.9 percent of the respondents receives information on child vaccination and prevention of diseases occasionally, 21.9 percent do not know how often they receive information while 11.9 percent of the respondents receives information on a regular basis. 11.4 percent rarely receives information about child vaccination and prevention of diseases.

Table 11: *Respondents who vaccinate their children*

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	307	83.0	83.0	83.0
No	63	17.0	17.0	100.0
Total	370	100.0	100.0	

Figure 11 shows that 83.0 percent of the respondents comply with child vaccination while 17.0 percent do not vaccinate their children. This reveals that there is a very high rate of compliance of child vaccination among lactating mothers.

Table 12: *How often respondents vaccinate their children*

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Regularly	102	27.6	27.6	27.6
Occasionally	103	27.8	27.8	55.4
Rarely	127	34.3	34.3	89.7
don't know	38	10.3	10.3	100.0
Total	370	100.0	100.0	

Figure 12 shows that 34.3 percent of the respondents rarely vaccinate their children, 27.8 occasionally vaccinate their children. However, 27.6 percent carry out the vaccination of their children on a regular basis while 10.3 percent do not know how often they vaccinate their children.

Table 13: *Respondents answer on the number of children vaccinated*

	Frequency	Percent	Valid Percent	Cumulative Percent
One	188	50.8	50.8	50.8
Two	135	36.5	36.5	87.3
Valid more than three	9	2.4	2.4	89.7
None	38	10.3	10.3	100.0
Total	370	100.0	100.0	

Table 13 shows that greater number of the respondents 50.8 percent has had at least one of their children vaccinated, 36.5 percent have had two of their children vaccinated, 10.3 vaccinated none of their children while 2.4 percent represents respondent who have vaccinated more than three of their children.

Table 14: *Respondents who think that child vaccination could lead to the prevention of diseases*

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	163	44.1	44.1	44.1
Valid No	72	19.5	19.5	63.5
don't know	135	36.5	36.5	100.0
Total	370	100.0	100.0	

In the above table, 44.1 percent represents respondents who think that child vaccination can lead to the prevention of diseases, 19.5 percent do not know whether child vaccination leads to the prevention of diseases while 36.5 respondents think that child vaccination does not lead to disease prevention.

Table 15 *Diseases respondents think child vaccination has prevented*

	Frequency	Percent	Valid Percent	Cumulative Percent
Polio	104	28.1	28.1	28.1
Measles	9	2.4	2.4	30.5
Hepatitis	4	1.1	1.1	31.6
Valid Chickenpox	2	.5	.5	32.2
don't know	226	61.1	61.1	93.2
all of the above	25	6.8	6.8	100.0
Total	370	100.0	100.0	

In table 15, 28.1 of the respondents think that child vaccination has prevented polio disease, 2.4 percent measles, 1.1 percent hepatitis, 0,5 percent chicken pox, 6.8 percent represents respondents who think child vaccination has prevented all the above mentioned diseases and 61.1 percent represent respondents who do not know the diseases prevent through child vaccination.

Table 16: *Respondents answer on whether information about child vaccination influence decision to vaccinate*

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	127	34.3	34.3	34.3
No	127	34.3	34.3	68.6
don't know	33	8.9	8.9	77.6
Sometimes	83	22.4	22.4	100.0
Total	370	100.0	100.0	

Table 16 reveals that 34.3 are influenced by information about child vaccination, on the other hand, 34.3 percent are not influenced while 22.4 percent said their decision to vaccinate their children are sometimes influenced. 8.9 percent do not know whether their decision are influenced or not.

Table 17: *The extent to which information about child vaccination influences respondents decision to vaccinate*

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly	111	30.0	30.0	30.0
not strongly	104	28.1	28.1	58.1
don't know	155	41.9	41.9	100.0
Total	370	100.0	100.0	

Table 17 reveals that 41.9 percent of the respondents do not know whether their decisions to vaccinate their children are based on information about risk, 30.0 percent of the respondents are strongly influenced by information about child vaccination while 28.1 percent are not influenced by information about child vaccination.

Analysis of Research Questions

The first research question of this study sought to know Who among these lactating mothers is aware of the risk associated with non vaccination of children.

Findings in Tables 5--10 reveal that about 85 percent of the respondents have heard of child vaccination which came mostly from health care professionals. It also reveals that about 55 percent of the respondents know the risk of not vaccinating their children. This leads to the conclusion that a greater number among lactating mothers are aware of child vaccination and the risk of not vaccinating a child.

The second research question sought to know the extent which lactating mothers comply with risk communication information on child vaccination and prevention of diseases?

The analysis of the respondents' compliance to risk communication information on child vaccination and prevention of diseases as shown in Tables 11-13 attested to the fact that respondents comply with these messages to a great extent. Though it was evident that over 83 percent of the respondents vaccinate their children, they do not carry this out on a regular basis. The tables equally show that at least one of the respondents' children has been vaccinated.

The third research question asked to know the relationship between child vaccination and prevention of diseases. Tables 14-15 reveals that about 44 percent of the respondents suggest that child vaccination could lead to the prevention of diseases.

The Fourth research question sought to find out if risk communication information influences lactating mothers' decision on child vaccination. This suggests a low level of influence as only about 34 percent believe that risk communication information on child vaccination has influenced their decisions to vaccinate their children.

DISCUSSION OF FINDINGS

The data analyzed in this study was obtained from 370 registered lactating mothers in selected hospitals spread across five geopolitical states of the south east zone in Nigeria. The overall results offer a wide range of conclusions. Findings from the study led to the conclusion that lactating mothers are aware of the risk of not vaccinating their children

The key research question asked to know whether lactating mothers comply with risk communication information of child vaccination and prevention of diseases. Findings have shown that the rate of compliance is still low.

CONCLUSION

This study used quantitative data collected from 390 respondents in selected hospital across capital cities in the South East zone to analyze the degree of awareness and compliance by lactating mothers regarding child vaccination and prevention of diseases. From the findings, a conclusion was made that lactating mothers are aware of the risk of not vaccinating their children, but there seems to exit a low level of compliance.

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