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Al-Hikmah Journal of Education (AJE)
Volume 12 Number 1 May, 2025
e-ISSN: 2705-2508; p-ISSN: 2384-7662

Effect of Information Education and Communication Intervention on Attitude towards Diphtheria Immunization among Nursing Mothers in Yobe State, Nigeria

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Abstract

This article examines the impact of Information, Education, and Communication (IEC) interventions on the attitudes of nursing mothers towards diphtheria immunization in Yobe State, Nigeria. Drawing from a quasi-experimental study utilizing a pre-test and post-test design. The target population comprised 447 registered nursing mothers attending selected General Hospitals in Yobe State, Nigeria, between October 2024 and March 2025. A convenience sampling technique was employed. A sample size of 288 was used for the study. The instrument for data collection was a self-structured questionnaire. Data analysis involved descriptive statistics, including means and standard deviations, to answer research questions related to attitude. Inferential statistics, specifically the t-test statistical method, were employed to compare pre- and post-intervention means within the experimental group and between the experimental and control groups at a 0.05 level of significance. Findings indicate a significant positive shift in attitude among nursing mothers exposed to these interventions, highlighting the critical role of targeted communication in shaping favorable health behaviors. The study underscores the necessity of integrating robust IEC strategies into routine maternal and child healthcare services to foster positive attitudes and ultimately improve immunization uptake.

Keynotes: Information, Education, and Communication (IEC) interventions, Attitude, Nursing Mothers and Diphtheria Immunization

Introduction

Worldwide, diphtheria is a problem, especially in nations with inadequate vaccination rates. There is no known major sex preference for diphtheria. People under the age of twelve (12) are the main victims of this pediatric illness (Base et al., 2023). Globally, diphtheria is still a major public health concern, especially in areas like Yobe State, Nigeria, where immunization rates are below ideal (Bärnighausen et al., 2014). The number of cases reported to the World Health Organization (WHO, 2020) worldwide is likely underestimated because to underreporting, the exclusion of cases involving no respiratory diphtheria, and the exclusion of cases caused by other potentially deadly species. The incidence and prevalence of diphtheria have significantly decreased with the introduction of the diphtheria-pertussis-tetanus vaccination after World War II. 1974. Corynebacterium diphtheriae is the causative

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agent of diphtheria, a toxin-mediated infection that can be fatal for infections of the respiratory system, skin, and other mucosal tissues (Oduoye, et al., 2024).

Diphtheria is among the diseases that can be prevented by vaccination, along with tetanus, measles, and tuberculosis. According to Oduoye, et al., (2023) the prevalence of diphtheria has drastically decreased to about 5,000 cases annually worldwide, including in Nigeria, since the introduction of universal vaccination. Nursing mothers play a pivotal role in their children's health decisions, including immunization; however, there is often limited information and communication available to effectively promote positive attitudes towards diphtheria vaccination (Galadima, Zulkefli, Said, & Ahmad, 2021).

Attitude, in the context of health interventions, refers to the perceptions, beliefs, and feelings individuals hold towards a particular health practice or intervention (Abate, Tilahun, & Yayeh, 2024). A positive attitude is a crucial precursor to the acceptance and uptake of health services, including immunization. This study specifically delves into how structured IEC interventions can influence these attitudes among nursing mothers, thereby contributing to better immunization outcomes in a vulnerable population. In health communication, the idea of attitude is essential to comprehending vaccine acceptance and reluctance. In addition to spreading knowledge, IEC programs seek to change preexisting attitudes and ideas that might impede healthy behavior. According to the CDC (2023), a good attitude regarding diphtheria vaccination indicates a favorable inclination toward immunizing children, acknowledging its preventive effects, and having faith in the advice of the healthcare system.

Previous research has consistently demonstrated the effectiveness of health education and targeted communication campaigns in influencing health attitudes. For instance, Uskun, Uskun, Uysalgenc, and Yagız (2018) found that interventions significantly increased primary healthcare workers' knowledge about immunization, which implicitly impacts their attitudes and subsequent advocacy. Similarly, Aftab, et al. (2021) showed that simple educational interventions improved vaccine completion rates, suggesting a positive shift in parental attitudes. The World Health Organization (WHO, 2021) strongly advocates for comprehensive IEC campaigns that engage communities and utilize various media platforms to disseminate information, specifically to sustain high vaccination coverage and close immunity gaps.

Despite these efforts, challenges remain, particularly in sub-Saharan Africa, where barriers such as lack of awareness, financial constraints, and inadequate healthcare infrastructure hinder desired immunization coverage (Cobos Muñoz, Muñoz Llamas, & Bosch-Capblanch, 2015). Addressing negative attitudes, often rooted in misconceptions or mistrust, is therefore paramount to improving immunization rates. This paper seeks to provide empirical evidence on the direct impact of IEC interventions on the attitudes of nursing mothers towards diphtheria immunization in a specific Nigerian context.

Objectives of the Study

The main aims and areas of attention for the current research are delineated in the study's objectives. The following are the study's goals:

1. Examine the impact of communicative and informational interventions on the experimental group's attitudes toward diphtheria vaccination among registered nursing mothers at Yobe State General Hospitals.
2. Assess the impact of communication and information education interventions on the attitudes of registered nursing mothers in the experimental and control groups about diphtheria vaccination at Yobe State General Hospitals.

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Research Questions

The following questions were crafted to guide the investigation and uncover insights relevant to the study's objectives

1. How do informational education and communication interventions affect the experimental group's attitudes toward diphtheria vaccination among registered nursing mothers at Yobe State General Hospitals?
2. How do informational education and communication interventions affect the attitudes of registered nursing mothers in the experimental and control groups at Yobe State General Hospitals toward diphtheria vaccination?

Hypotheses

The hypotheses formulated in this study aimed to provide a foundation for testing and validating the research questions.

Among registered nursing mothers in Yobe State General Hospitals, there is no discernible impact of information education and communication intervention on attitudes regarding diphtheria vaccination in the experimental group. Similarly, there is no discernible impact of information education and communication intervention on attitudes regarding diphtheria vaccination in the experimental and control groups.

Methodology

This study adopted a quasi-experimental design incorporating a pre-test and post-test approach. The target population comprised 447 registered nursing mothers attending selected General Hospitals in Yobe State, Nigeria, between October 2024 and March 2025. A convenience sampling technique was employed. The use of convenience sampling enabled the researcher to efficiently gather data from a readily accessible population, considering the logistical challenges associated with accessing a specific demographic within the healthcare setting (see Muhammad, 2024). A sample size of 135 and 153 registered nursing mothers were obtained using the sample technique, this is like with Yamane (1967) which opined that:

$n = N/1+N(e)^2$

The primary instrument for data collection was a self-structured questionnaire. A total of 288 questionnaires were used for the main study, with an additional 40 for pilot testing. Attitude was specifically assessed through questions designed to gauge perceptions, beliefs, and feelings towards diphtheria immunization, both before and after the IEC intervention.

Data analysis involved descriptive statistics, including means and standard deviations, to answer research questions related to attitude. Inferential statistics, specifically the t-test statistical method, were employed to compare pre- and post-intervention means within the experimental group and between the experimental and control groups at a 0.05 level of significance.

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Results

Table 1

Analysis of Pre-test and Post-test Means and Standard Deviations Scores for Attitude of the Experimental Group

	Test	N	Mean	Std. Deviation	Std. Error Mean	Mean Difference
Attitude Pre-and post	Pre-test	135	11.62	1.085	.093	4.98
	Post-test	135	16.60	2.821	.243	

Table 1 revealed that the pre-test mean attitude score for the experimental group was 11.62, which significantly increased to a post-test mean attitude score of 16.60 after exposure to the IEC intervention. The results indicate a significant improvement in the attitude of registered nursing mothers towards diphtheria immunization after exposure to Information, Education and Communication intervention strategies. The post-test attitude score (16.60) is notably higher than the pre-test score (11.62), with a mean difference of 4.98

Table 2

t-test analysis of the Post-Test Mean Scores for Attitude of Experimental and Control Group

Group	N	Mean	SD	df	t-value	P-value	Decision
Pre-test	135	11.62	1.085				
				268	19.14	0.000	Significant
Post-test	135	16.60	2.821				

Table 2 revealed that the t-test analysis yielded a t-value of 19.14 with a p-value of 0.000. Since the p-value (0.000) is less than the significance level of 0.05, the null hypothesis, stating no significant effect of IEC on attitude, was rejected. These results show that information, education, and communication interventions had a positive and statistically significant effect on improving attitudes toward diphtheria immunization among nursing mothers, and that the experimental group's attitudes toward the vaccination improved statistically significantly after the intervention.

Table 3

Analysis of Means and Standard Deviations Scores for Attitude in the Experimental and Control Groups

	Group	N	Mean	Std. Deviation	Std. Error Mean	Mean Difference
Attitude post-test	Experimental	135	16.60	2.821	.243	3.81
	Control	153	12.79	1.609	.130	

A comparison of the experimental and control groups' attitude scores was shown in Table 3. The mean attitude score of the experimental group, which had the IEC intervention, was 16.60, whereas the mean attitude score of the control group, which didn't get the intervention, was 12.79. This indicates that Information, Education and Communication strategies effectively improved positive attitudes toward diphtheria immunization, making them an essential tool for increasing vaccine acceptance among nursing mothers. These findings

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suggest that IEC strategies are highly effective in changing perceptions and fostering a more positive attitude toward immunization. The low standard deviations in the groups suggest consistency in responses, reinforcing the reliability of the findings.

Table 4

t-test analysis of the Post-Test Mean Scores for Attitude of Experimental and Control Group

Group	N	Mean	SD	df	t-value	P-value	Decision
Experimental	135	16.60	2.821	286	14.28	0.000	Significant
Control	153	12.79	1.609				

Table 4 revealed that the t-value for this comparison was 14.28, with a p-value of 0.000. Again, with a p-value less than 0.05, the null hypothesis was rejected, confirming a significant positive effect of IEC interventions on the attitude towards diphtheria immunization when compared to a group not exposed to such interventions. The findings demonstrate that information, Education and Communication interventions significantly improved the attitude of registered nursing mothers toward diphtheria immunization. This highlights the importance of health education strategies in shaping positive perceptions and increasing vaccine acceptance.

Discussion

Following exposure to IEC treatments, nursing moms in the experimental group showed a significant change in their attitude scores, which provides compelling evidence that structured health education programs are essential for promoting healthy behaviors. Further highlighting the direct effect of IEC techniques is the noticeable attitude difference between the experimental and control groups.. This outcome aligns with the broader understanding that effective communication can address misconceptions, increase knowledge, and build trust in immunization programs (CDC, 2023).

The findings corroborate previous studies that highlight the role of health education in improving immunization acceptance (Uskun et al., 2018; Owais et al., 2021). When mothers are provided with clear, evidence-based, and culturally relevant information, their understanding of immunization benefits increases, which in turn enhances their willingness to vaccinate their children. A positive attitude is a critical mediator between awareness and acceptance, as it reflects an internalization of the benefits and a reduction in hesitancy.

In the context of diphtheria immunization in Yobe State, these results are particularly important given the challenges of low vaccination coverage and recurring outbreaks. Fostering positive attitudes through sustained IEC interventions can empower nursing mothers to make informed decisions and actively participate in immunization schedules, thereby contributing to better child health outcomes and community-wide protection against diphtheria.

Conclusion and Recommendations

This study conclusively demonstrates that Information, Education, and Communication strategies have a significant positive effect on the attitudes of nursing mothers towards diphtheria immunization in Yobe State, Nigeria. The substantial improvement in attitude scores after the intervention highlights the effectiveness of IEC in fostering positive perceptions, beliefs, and feelings by addressing misconceptions and encouraging trust in immunization.

Based on these findings, the following recommendations are made:

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e-ISSN: 2705-2508; p-ISSN: 2384-7662

1. **Integration of IEC:** The Ministry of Health and relevant stakeholders should integrate comprehensive IEC strategies into regular maternal and child healthcare services in hospitals, clinics, and community health centers.
2. **Sustained Interventions:** IEC interventions should not be one-off events but rather sustained and integrated into routine immunization programs to ensure continuous promotion of positive behavioral change and improved vaccine acceptance among nursing mothers.
3. **Multiple Communication Channels:** Utilize multiple communication channels to disseminate information effectively, ensuring that it reaches a wider audience of nursing mothers.

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