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Effectiveness of a Self-Instructive Educational Approach on Knowledge and Attitude Regarding Immunization of Under-Five Children Among Nursing Students

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ABSTRACT

Background: Immunization is a vital public health intervention, and nursing students play a key role in vaccine promotion and delivery. However, gaps in knowledge and passive attitudes among students may hinder effective vaccine advocacy.

Aim: To evaluate the effectiveness of a self-instructional educational module in improving nursing students' knowledge and attitude toward immunization of under-five children.

Methods: A pre-experimental one-group pre-test post-test design was used among 87 third- and fourth-year nursing students. A validated self-instructional module was administered, and knowledge and attitude were assessed using structured questionnaires before and after the intervention.

Results: Post-intervention, students with "good" knowledge scores increased from 9.2% to 64.4%, and those with favorable attitudes rose from 14.9% to 65.5%. A significant positive correlation ($r = 0.62$, $p < 0.001$) was found between knowledge and attitude. Associations were observed between pre-test knowledge and prior immunization program participation ($p = 0.048$), and between favorable attitudes and source of immunization knowledge ($p = 0.039$).

Conclusion: The self-instructive module significantly enhanced students' knowledge and attitudes toward childhood immunization. Integrating such tools into nursing education can prepare students as effective immunization advocates.

Keywords: *Nursing students; Immunization; Self-instructional module; Vaccine education; Attitude; Knowledge; Under-five children; Educational intervention*

1. INTRODUCTION

The immunization of children under five remains a cornerstone of public health, effectively reducing morbidity and mortality from vaccine-preventable diseases. As future frontline healthcare providers, nursing students must be well-versed in immunization practices. However, studies indicate that knowledge gaps and varying attitudes among nursing students can hinder their effectiveness in promoting immunization. One such intervention involved the use of a self-information leaflet, which significantly improved nursing students' knowledge about immunization. In a pre-test/post-test study, the proportion of students with good knowledge rose markedly after engaging with the material. The mean difference in knowledge scores demonstrated statistically significant improvement, validating the efficacy of self-instructive educational methods [1]. Complementary evidence comes from simulation-based learning strategies. While these simulations did not necessarily lead to measurable differences in immunization performance, they significantly enhanced students' satisfaction and self-confidence in learning environments [2].

Increased confidence can play a crucial role in improving clinical competence and patient communication, both essential in immunization practices.Attitudinal factors also matter greatly. Research has found that structured teaching programs positively influence both knowledge and attitudes among nurses. For instance, a study evaluating a training session in Minia city reported significant gains in knowledge about infection control, vaccine types, and parent education post-intervention [3].

Similarly, an investigation into undergraduate nursing students revealed that perceived knowledge strongly influenced attitudes toward childhood vaccination [4]. Further studies highlight that continuous education through community-based

programs and teaching resources helps reinforce immunization content among nursing students, especially when materials are integrated into curriculum design [5]. Additionally, motivational interviewing training has been shown to enhance both confidence and skills in communicating vaccine information, offering another self-instructive avenue [6]. Nurse behavior and their own vaccination status also play roles in shaping effective immunization advocacy. Studies show that nurses' attitudes toward the importance of vaccination significantly correlate with their personal vaccine uptake and their likelihood to promote vaccines to others [7]. The trust and empathy shown by nurses influence parental motivation for immunizing their children, underlining the broader impact of student training on public health [8]. The primary aim of this study is to evaluate the effectiveness of a self-instructive educational approach in enhancing the knowledge and attitude of nursing students regarding immunization of under-five children

2. METHODOLOGY

Research Design:- The study employed a pre-experimental one-group pre-test post-test design to evaluate the effect of a self-instructive educational approach on nursing students' knowledge and attitude regarding immunization of under-five children.

Setting and Population:- The study was conducted in a selected nursing college. The population included students enrolled in the Bachelor of Science in Nursing program.

Sample and Sampling Technique:- A total of 87 nursing students from the third and fourth years were included in the study. Participants were selected through non-probability purposive sampling, based on their academic level and willingness to participate.

Inclusion Criteria

- Third- and fourth-year B.Sc. Nursing students
- Willing to participate and available for both pre-test and post-test
- Able to read and understand the self-instructional module in English

Exclusion Criteria

- Students who had prior formal education or training specifically focused on childhood immunization during the current academic year
- Those who were absent during the intervention period

Intervention :- The intervention consisted of a self-instructive educational module developed to enhance students' understanding of immunization for under-five children. It covered key topics such as types of vaccines, national immunization schedules, benefits, safety, and common misconceptions. Students were given the module to study independently over a one-week period.

Data Collection Tools :- Three tools were used: a demographic data sheet (age, academic year, prior training), a structured knowledge questionnaire (multiple-choice), and a 5-point Likert attitude scale. All tools were validated by subject experts for content relevance. The reliability of the knowledge and attitude tools was established using Cronbach's alpha, indicating good internal consistency.

Data Collection Procedure :- A pre-test using all tools was conducted to assess baseline data. Students then received a self-instructional module and studied it for one week. A post-test was administered afterward. Validation and reliability of tools were confirmed prior to data collection to ensure accurate measurement.

Data Analysis :- Data were analyzed using descriptive statistics (mean, frequency, percentage) to summarize participant characteristics and scores. Inferential statistics, specifically the paired t-test, were used to assess the significance of the difference between pre- and post-test scores. A p-value of <0.05 was considered statistically significant.

3. RESULTS

Table 1: Demographic Characteristics of Participants (n = 87)

Demographic Variable	Category	Frequency (n)	Percentage (%)
Age (in years)	20–21	34	39.1%
	22–23	41	47.1%
	≥24	12	13.8%

Academic Year	3rd Year	45	51.7%
	4th Year	42	48.3%
Participation in Immunization Program	Yes	82	94.3%
	No	5	5.7%
Attended Previous Class on Immunization	Yes	76	87.4%
	No	11	12.6%
Primary Source of Knowledge	Teachers/Classroom	47	54.0%
	Clinical Experience	18	20.7%
	Internet/Social Media	12	13.8%
	Peer Discussions/Seminars	10	11.5%

Above table show that The majority of participants were aged 22–23 years (47.1%), with a nearly equal distribution between 3rd-year (51.7%) and 4th-year (48.3%) students. A large proportion (94.3%) had previously participated in immunization programs, and 87.4% reported attending a class on immunization. Teachers and classroom instruction were cited as the primary source of immunization knowledge by 54% of students, highlighting the strong influence of formal education.

Table 2: Categorical Distribution of Knowledge Scores in Pre-test and Post-test (n = 87)

Knowledge Level	Pre-test (n, %)	Post-test (n, %)
Poor (0–15)	38 (43.7%)	5 (5.7%)
Average (16–22)	41 (47.1%)	26 (29.9%)
Good (23–30)	8 (9.2%)	56 (64.4%)

Above table 2 show Knowledge levels improved significantly after the self-instructional module. In the pre-test, nearly half (43.7%) of students scored in the poor category, and only 9.2% were categorized as having good knowledge. Post-test results showed a dramatic shift, with 64.4% scoring in the good category and only 5.7% remaining in the poor range.

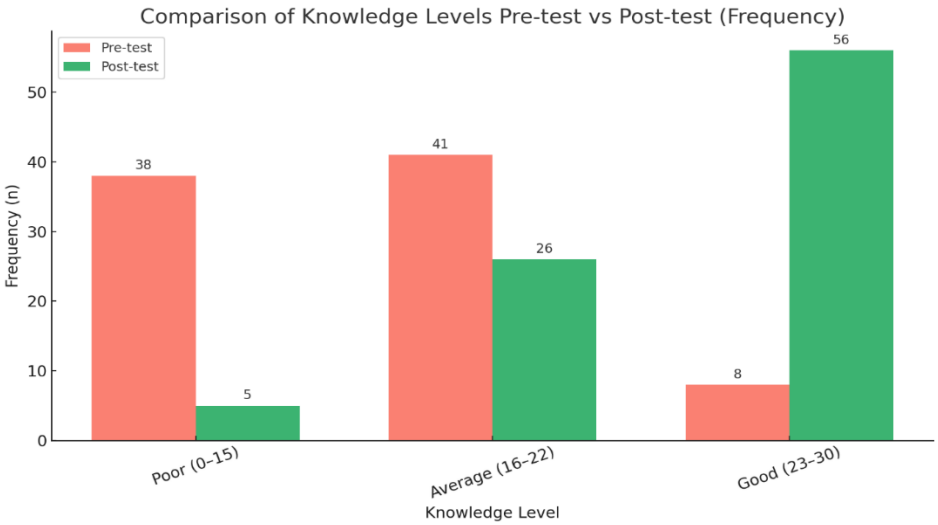

Figure 1. Comparison of Knowledge Levels on Immunization Among Nursing Students: Pre-test vs Post-test

Table 3: Categorical Distribution of Attitude Scores in Pre-test and Post-test (n = 87)

Attitude Level	Pre-test (n, %)	Post-test (n, %)
Unfavorable (10–23)	29 (33.3%)	4 (4.6%)
Neutral (24–36)	45 (51.7%)	26 (29.9%)
Favorable (37–50)	13 (14.9%)	57 (65.5%)

Above table show that Attitude levels showed marked improvement following the educational intervention. The proportion of students with a favorable attitude increased from 14.9% pre-intervention to 65.5% post-intervention. Those with unfavorable attitudes dropped sharply from 33.3% to just 4.6%, indicating a strong positive impact of the module on students' perceptions of immunization.

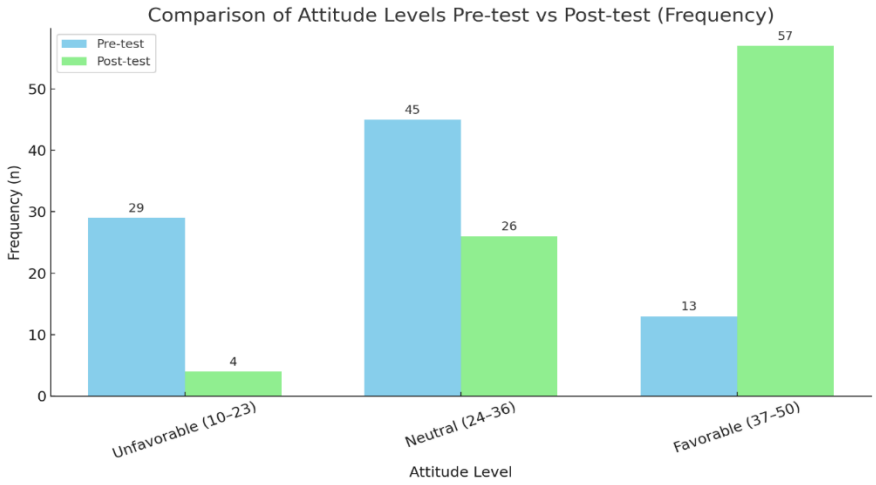

Figure 2. Comparison of Attitude Levels Toward Immunization Among Nursing Students: Pre-test vs Post-test

Table 4: Paired t-test Comparison of Pre-test and Post-test Scores (n = 87)

Variable	Mean ± SD (Pre-test)	Mean ± SD (Post-test)	Mean Difference	t-value	p-value
Knowledge Score	14.2 ± 3.6	23.5 ± 4.1	9.3	18.45	< 0.001*
Attitude Score	29.8 ± 5.2	39.6 ± 4.7	9.8	16.89	< 0.001*

*p < 0.05 considered statistically significant

Above table show that Statistical analysis using paired t-tests confirmed a significant improvement in both knowledge and attitude scores after the intervention. The mean knowledge score increased by 9.3 points, and the mean attitude score rose by 9.8 points, both changes being statistically significant at p < 0.001.

Table 5: Association of Pre-test Knowledge and Attitude with Demographic Variables (Chi-square Test)

Demographic Variable	Category	Knowledge (p-value)	Attitude (p-value)
Age	20–21, 22–23, ≥24	0.271	0.198
Academic Year	3rd, 4th	0.134	0.112
Participation in Immunization	Yes, No	0.048*	0.021*

Attended Immunization Class	Yes, No	0.041*	0.056
Source of Knowledge	4 Categories	0.065	0.039*

*p < 0.05 statistically significant

Above table show Chi-square analysis revealed significant associations between pre-test knowledge and two demographic factors: participation in immunization programs (p = 0.048) and attendance in a previous class on immunization (p = 0.041). Attitude scores were significantly related to participation (p = 0.021) and source of knowledge (p = 0.039), indicating that students with practical exposure and reliable information sources were more likely to have favorable attitudes.

4. DISCUSSION

The findings of this study demonstrate a clear and statistically significant improvement in both knowledge and attitude of nursing students regarding immunization of under-five children following a self-instructive educational intervention. This aligns with previous studies emphasizing the importance of structured, independent learning tools in nursing education.

Nursing students are future advocates for immunization and play a pivotal role in increasing vaccine acceptance among the public. Ensuring they have accurate knowledge and positive attitudes is essential for successful immunization programs. This study demonstrated the effectiveness of a self-instructional module in significantly improving both knowledge and attitude regarding under-five child immunization. These findings align with previous research emphasizing the impact of educational interventions on healthcare students' preparedness for vaccine advocacy [9,10].Pre-test results revealed that only 9.2% of students scored in the "good" knowledge range, while 43.7% had poor knowledge. These gaps reflect findings from Sharma et al. [11], who reported limited baseline knowledge of immunization among nursing interns in India, and Suleman et al. [12], who found similar knowledge deficits in South African students.

After the intervention, 64.4% of students achieved "good" knowledge scores and favorable attitudes rose from 14.9% to 65.5%. These results reflect the effectiveness of structured, independent learning. Comparable studies by El-aty and Mahmoud [10] and Atitt-Allah et al. [13] reported similar gains in knowledge and professional behavior following educational interventions. At the pre-test stage, only 14.9% of nursing students demonstrated favorable attitudes toward immunization, while the majority exhibited neutral or unfavorable views. These findings suggest a passive stance toward vaccine advocacy, which can hinder effective public health messaging. Similar attitude gaps have been observed in other nursing domains. For example, Torabizadeh et al. [14] found low baseline attitudes toward HPV vaccination among nursing students, emphasizing the need for early educational engagement. Additionally, Stipandić and Babic [15] noted that even though nursing students had better knowledge than non-medical peers, their attitudes toward vaccines were only marginally more positive, suggesting that formal education alone may be insufficient without targeted attitude-shaping efforts. Following the educational intervention, favorable attitudes rose significantly to 65.5%, confirming the effectiveness of the self-instructional module in influencing students' perceptions. This aligns with findings by Berenson et al. [16], who reported a marked improvement in HPV vaccine counseling readiness among nursing students after a short educational session. Similarly, Marques-Vieira et al. [17] found that focused academic training led to more positive vaccine attitudes in senior nursing students.

In this study, a statistically significant positive correlation (r = 0.62, p < 0.001) was found between nursing students' knowledge and attitude scores regarding immunization, suggesting that improved knowledge is associated with more favorable attitudes. This finding aligns with Sharma et al. [11], who reported a similar correlation after administering a self-instructional module. Likewise, El-aty and Mahmoud [10] observed that enhanced vaccine knowledge led to improved confidence and advocacy attitudes. Chicoine et al. [9] and Atitt-Allah et al. [13] also reported concurrent gains in knowledge, self-efficacy, and positive immunization attitudes after self-paced and structured education. Significant associations were observed between students' pre-test knowledge and factors such as participation in immunization programs (p = 0.048) and attending prior immunization classes (p = 0.041), while favorable attitudes were associated with source of knowledge (p = 0.039) and immunization experience (p = 0.021). These results are consistent with findings by Suleman et al. [12], who identified prior immunization exposure as a key influence on baseline preparedness. Marques-Vieira et al. [17] also reported that students with more clinical training exhibited stronger pro-vaccine attitudes. Torabizadeh et al. [14] found that attendance in HPV workshops improved knowledge and advocacy skills, while Munir et al. [18] showed that vaccination training programs led to measurable improvements in both attitude and practice among nurses.

5. CONCLUSION

This study confirmed that a self-instructive educational module significantly improved nursing students' knowledge and attitudes toward under-five immunization. The strong correlation between knowledge and attitude, along with associations with prior educational and clinical experience, highlights the value of combining theoretical and practical learning. Incorporating such modules into nursing curricula can prepare students to serve as informed and confident advocates for immunization.

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