

A Study to Evaluate the Effectiveness of Self-Instructional Module (SIM) on Knowledge Regarding Prevention of Mother to Child Transmission of HIV among B.Sc.(N) IV-Year Students in Selected Colleges of Nursing at Hassan

Roopa G. T.

Government College of Nursing Hassan

Abstract: *Background:* Mother-to-child transmission (MTCT) of Human Immunodeficiency Virus (HIV) remains a significant public health challenge, occurring during pregnancy, labour, delivery, or breastfeeding. Nursing students require adequate knowledge of prevention of mother-to-child transmission (PMTCT) to provide effective maternal and neonatal care. *Objectives:* To assess the pre-existing knowledge of IV-year B.Sc. Nursing students regarding PMTCT of HIV, evaluate the effectiveness of a self-instructional module (SIM), and determine the association between pre-test knowledge scores and selected socio-demographic variables. *Methods:* A pre-experimental one-group pre-test–post-test design was employed among 80 IV-year B.Sc. Nursing students from selected nursing colleges in Hassan using convenient sampling. Data were collected using a structured knowledge questionnaire. Following the pre-test, participants received a self-instructional module on PMTCT of HIV. A post-test was conducted after the intervention. Data were analysed using descriptive statistics (frequency, percentage, mean, and standard deviation) and inferential statistics (paired t-test and chi-square test). *Results:* In the pre-test, 82.5% of students had inadequate knowledge regarding PMTCT of HIV. Following the intervention, 72.5% demonstrated adequate knowledge in the post-test. A statistically significant improvement was observed in post-test knowledge scores ($p < 0.05$). Significant associations were found between pre-test knowledge and selected demographic variables, including sex, residence, and previous knowledge of HIV. *Conclusion:* The self-instructional module was effective in improving nursing students' knowledge regarding PMTCT of HIV. Educational interventions can enhance nursing students' competency in PMTCT services and contribute to improved maternal and child health outcomes.

Keywords: Human Immunodeficiency Virus, Mother-to-Child Transmission, Prevention of Mother-to-Child Transmission, Self-Instructional Module, Nursing Students, Knowledge.

1. Introduction

Human Immunodeficiency Virus (HIV) continues to pose a significant challenge to global public health despite advancement in medical science and preventive healthcare service. Despite significant advancement in prevention and treatment, HIV continues to affect millions of people worldwide. One of the most concerning modes of transmission in mother-to-child transmission (MTCT), which may occur during pregnancy, childbirth, or breastfeeding. (1)

In the absence of timely preventive measures, HIV transmission from an infected mother to her child can occur during pregnancy, childbirth, or breastfeeding, with transmission reported between 15% and 45%. (2, 3) However, effective preventive measures such as antiretroviral therapy, safe delivery practices, counselling, and appropriate infant feeding methods can reduce the transmission rate to below 5%.

Nurses and nursing students play a vital role in providing education, counseling, and care related to PMTCT services. Adequate knowledge regarding HIV prevention is essential for nursing students to deliver effective maternal and neonatal healthcare services in the future. Educational strategies such as self-instructional modules can

significantly improve students understanding and awareness regarding PMTCT (4).

2. Need for Study

Globally, millions of women and children's are affected by HIV infection. India has one of the largest population living with HIV/AIDS. Karnataka is among the high prevalence states for HIV infection. Despite advancements in PMTCT service, lack of adequate knowledge among healthcare providers and nursing students remains a barrier to effective prevention. (5)

Nurses play an important role in healthcare delivery, particularly in maternal and child health services. (6) They are responsible for counselling health education, and prevention of HIV transmission. Therefore, it is essential to equip nursing students with adequate knowledge regarding PMTCT during their educational preparation.

The investigator observed the need to assess the existing knowledge of nursing students regarding PMTCT and to improve their knowledge through a structured education intervention. Hence the present study was undertaken.

3. Objectives of the Study

- 1) To assess the pre-existing knowledge of B.Sc. (N) IV year students regarding prevention of mother to child transmission of HIV.
- 2) To evaluate the effectiveness of self-instructional module on knowledge regarding prevention of mother to child transmission of HIV.
- 3) To determine the association between pre-test knowledge scores regarding prevention of mother to child transmission of HIV with their selected socio-demographic variables.

Hypotheses

H₁ - There will be significant differences between pre-test and post-test knowledge score of B.Sc. (N) IV year students regarding prevention of mother to child transmission of HIV.

H₂ - There will be significant association between pre-test knowledge scores of B. Sc (N) IV year students with selected socio-demographic variables.

4. Conceptual Framework

The conceptual framework for the present study was based on Imogene M. King's Goal Attainment theory. The theory emphasizes interaction, communication and mutual goal achievement between individual, which supports the educational approach used in study.

Research Methodology

The present study employed a pre-experimental one-group pre-test-post-test research design to evaluate the effectiveness of a self-instructional module (SIM) on knowledge regarding the prevention of mother-to-child transmission (PMTCT) of HIV among IV-year B.Sc. Nursing students.

The study was conducted at two selected nursing colleges in Hassan, namely Rajeev College of Nursing and Government College of Nursing. The independent variable was the self-instructional module on PMTCT of HIV, while the dependent variable was the knowledge of IV-year B.Sc. Nursing students regarding PMTCT. Selected demographic characteristics, including age, sex, religion, residence, type of family, previous knowledge, and source of information, were considered as extraneous variables that could influence the study outcomes. The study population comprised all IV-year B.Sc. Nursing students enrolled in the selected nursing colleges. A total of 80 students who fulfilled the eligibility criteria were selected using a non-probability convenience sampling technique.

Students who were studying in the selected colleges, willing to participate, and available during the period of data collection were included in the study, whereas those who were unavailable at the time of data collection were excluded. Baseline knowledge regarding PMTCT of HIV was assessed using a structured knowledge questionnaire during the pre-test. Following the pre-test, participants received the self-instructional module, and a post-test was

conducted after the intervention to evaluate changes in knowledge.

The collected data were analyzed using descriptive statistics, including frequency, percentage, mean, and standard deviation, as well as inferential statistics such as the paired *t*-test to determine the effectiveness of the intervention and the chi-square test to examine the association between pre-test knowledge scores and selected demographic variables. This methodology enabled a systematic evaluation of the effectiveness of the self-instructional module in improving knowledge regarding the prevention of mother-to-child transmission of HIV among nursing students.

5. Data collection Tool

The tool used for data collection

Section A

Socio-demographic variables. Section A dealt with the socio demographic variables, which was used to collect the characteristics of the samples. It contains 7 items such as age, sex, religion, area of residence, type of family, previous knowledge and source of information regarding prevention of mother to child transmission of HIV.

Section B

A structured knowledge questionnaire consisting of 40 items related prevention of mother to child transmission of HIV.

Intervention

Self-Instruction module regarding prevention of mother to child transmission of HIV was administered to participants after the pre-test

Ethical consideration

Permission was obtained from concerned authorities before conducting the study. Informed consent was obtained from participants. Confidentiality and anonymity of the participants were maintained throughout the study.

Statistical analysis

The collected data were analysed using descriptive statistics such as frequency, percentage, mean, and standard deviation. Inferential statistics such as paired *t*-test and chi-square test were used to determine the effectiveness of the intervention and the association between variables.

6. Results

The term analysis refers to a number of closely related operations which are performed with the purpose of summarizing the collected data and organizing data in such a manner that they answer the research questions.

Objective 1: To assess the pre-existing knowledge of B.Sc (N) IV year students regarding prevention of mother to child transmission of HIV.

Table 1: Mean, mean percentage and standard deviation for the pre-test knowledge of B.Sc (N) IV year students, N=80

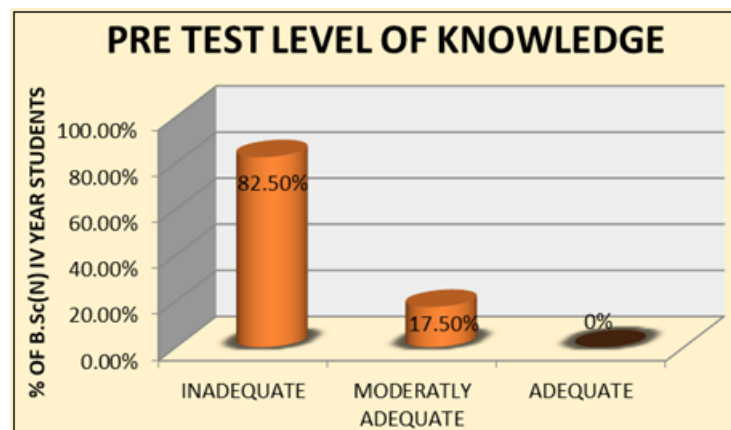
Knowledge on	No. of question	Min-max score	Mean	SD	% of mean score
Knowledge regarding ways of mother to child transmission of HIV	16	0-16	8.6	1.90	53.75%
Knowledge regarding prevention of mother to child transmission of HIV	24	0-24	8.1	2.32	33.75%
Overall	40	0-40	16.8	3.25	42%

The above table shows the assessment of knowledge of B.Sc (N) IV year students before administration of SIM among different aspects of prevention of mother to child transmission of HIV. Students shows the less knowledge level of 33.75% in the area of Knowledge regarding prevention of mother to child transmission of HIV and highest knowledge level 53.75% in the area of Knowledge regarding ways of mother to child transmission of HIV. And they are having 42% of overall pre-test knowledge score before the administration of SIM.

Table 2: Level of Pretest Knowledge, N=80

Grade	No. of B.SC(N) IV year students	%
Inadequate	66	82.5%
Moderate	14	17.5%
adequate	0	0.0%
Total	80	100%

The above table depicted the distribution of pre-test knowledge level of B.Sc(N) IV year students regarding prevention of mother to child transmission of HIV. 66(82.5%) of the subjects had inadequate level of knowledge whereas 14(17.5%) of the subjects had moderate level of knowledge and none of them had adequate knowledge.

**Figure 1:** Cylindrical Diagram Showing Pre-Test Knowledge Level

Section-III

Analysis and interpretation of post-test knowledge score of b.sc (n) IV-year students on prevention of mother to child transmission of HIV

Table 3: Mean, mean percentage and standard deviation for the Post-test knowledge of B. Sc (N) IV-year students, N=80

Knowledge on	No. of question	Min-max score	Mean	SD	% of mean score
Knowledge regarding ways of mother to child transmission of HIV	16	0-16	14.3	1.32	89.43%
Knowledge regarding prevention of mother to child transmission of HIV	24	0-24	19.06	3.27	79.41%
OVERALL	40	0-40	33.3	3.97	83.25%

The above table shows the assessment of knowledge of B.Sc (N) IV year students after administration of SIM among different aspects of prevention of mother to child transmission of HIV. Students shows the least knowledge level of 79.41% in the area of prevention of mother to child transmission of HIV and highest knowledge level 89.43% in the area of ways of mother to child transmission of HIV. And they are having 83.25% of overall post-test knowledge score after the administration of SIM.

Table 4: Level of Post Test Knowledge, N=80

Grade	No. of B.SC(N) IV year students	%
Inadequate	0	0%
Moderate	22	27.5%
Adequate	58	72.5%
Total	80	100%

The above table depicted the distribution of post-test level of knowledge of B.Sc (N) IV year students regarding prevention of mother to child transmission of HIV. 58(72.5%) of the subjects had adequate level of knowledge whereas 22(27.5%) of the subjects had moderate level of knowledge and none of them had inadequate knowledge.

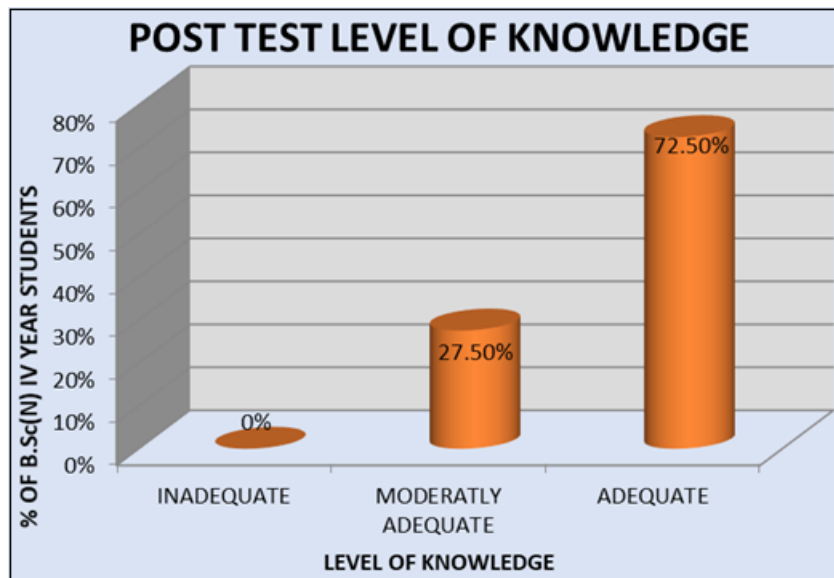


Figure 2: Cylindrical Diagram Showing Distribution of Subjects According to Post Test Level of Knowledge

Section IV

Analysis And Interpretation of Effectiveness of Sim on Prevention of Mother to Child Transmission of HIV Among B.Sc (N) IV Year Students

Objective 2: To evaluate the effectiveness of self-instructional module on knowledge regarding prevention of mother to child transmission of HIV

Table 5: Comparison of Pre-Test and Post Test Knowledge

	Pre test		Post test		Chi- square test
	No. of B.Sc (N) IV- year students	%	No. of B.Sc (N) IV- year students	%	
Inadequate	66	82.5%	0	0%	$\chi^2 = 125.76^*$ $p = 5.99$ significant
Moderate	14	17.5%	22	27.5%	
Adequate	0	0%	58	72.5%	

$p = 0.05^*$ significant DF: 2

The above table shows comparison of pre and post test knowledge level, tested by chi-square (125.76) which reveals that Chi-square calculated value is more than the

Chi-square table value so there is significant increase in knowledge level after administration of SIM.

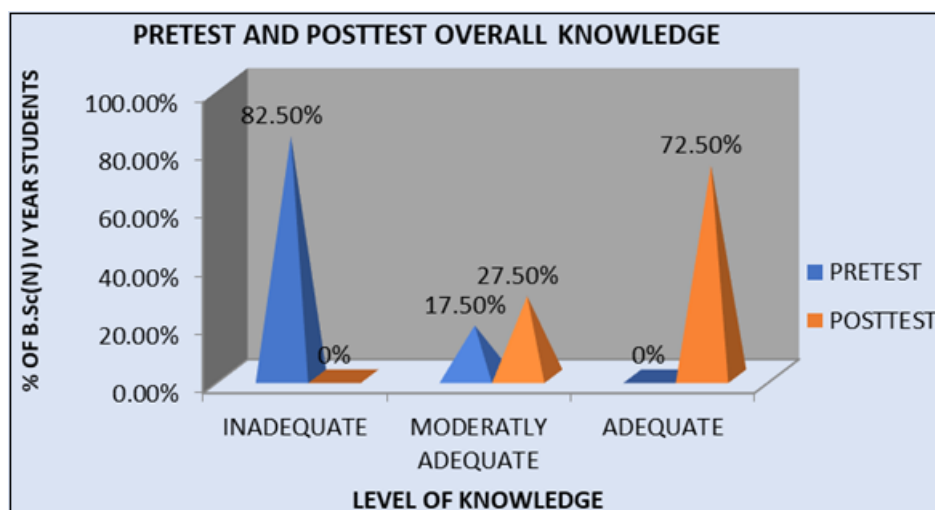


Figure 4: Pyramid Diagram Showing Comparison of Pretest and Post- Test Overall Knowledge

Table 6: Effectiveness of Self- Instructional Module

	% of pretest knowledge	% of posttest knowledge	% of knowledge gain
Knowledge	42	83.25	41.25

The above table shows effectiveness of self-instructional module by comparing pre-test and post-test knowledge score, which shows 41.25% of knowledge gain.

Section-V

Objective 3: To determine the association between pre-test knowledge scores regarding prevention of mother to child transmission of HIV with their selected socio-demographic variables.

Data presented in the above table for pre- test indicate that the chi square values of demographic variables like Age, religion, type of family, and source of information are not significant at 0.05level of significance. On the contrary the chi square values of sex, residence and previous information are significant at 0.05level of significance. Thus, it is concluded that there is significant association between knowledge score of B.Sc (N) IV- year students and with their socio demographic variables. Hence, we accept the research hypothesis H2.

7. Discussion

The present study demonstrated that self-instructional module was effective in improving knowledge regarding prevention of mother to child transmission of HIV among nursing students. Similar findings were reported in previous studies where educational intervention significantly enhanced knowledge and awareness related to HIV prevention.

The improvement in post test score significant the importance of structured education programmes in nursing education.

8. Nursing Implication**Nursing practice**

Nurses should actively participate in counselling and PMTCT services.

Nursing education

Educational programmes and SIMs should be included in nursing curriculum.

Nursing administration

Administrator should organize continuing education programmes regarding HIV prevention.

Nursing research

Further studies can be conducted using larger sample size and different setting to enhance generalizability of findings

9. Limitations of the Study

The study was limited by its pre-experimental one-group pre-test–post-test design without a control group. It was conducted among 80 IV-year B.Sc. Nursing students from two selected nursing colleges using convenience sampling, limiting the generalizability of the findings. The study assessed only the immediate effect of the self-instructional module on knowledge and did not evaluate long-term knowledge retention, attitudes, or clinical practices related to PMTCT of HIV.

10. Conclusion

Structured educational interventions are essential for strengthening nursing students understanding, clinical competency and professional preparedness related to PMTCT services. The study concluded that self-instructional module was effective in improving the knowledge of IV year B.Sc. nursing students regarding prevention of mother to child transmission of HIV.

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