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"Evaluate the effectiveness of video assisted teaching on knowledge regarding needle stick injury and it's preventive measures among Nursing Students of selected nursing colleges of Udaipur, city, Rajasthan."

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ABSTRACT:

Background: Needlestick injuries (NSIs) are among the most common occupational hazards faced by healthcare professionals, particularly nursing students, due to frequent handling of needles and sharp instruments during clinical training. These injuries expose individuals to serious blood-borne infections such as Hepatitis B virus (HBV), Hepatitis C virus (HCV), and Human Immunodeficiency Virus (HIV). Despite the availability of standard precautions and preventive guidelines, inadequate knowledge and unsafe practices continue to contribute to the high incidence of NSIs. Video-assisted teaching (VAT) has emerged as an effective educational strategy to enhance knowledge and promote safe clinical practices.

Objectives:

1. To assess the pre-test knowledge regarding needle stick injury and its preventive measures among nursing students.
2. To evaluate the effectiveness of video-assisted teaching on knowledge regarding needle stick injury and its preventive measures among nursing students.
3. To determine the association between pre-test knowledge scores and selected socio-demographic variables.

Methods:

A quantitative quasi-experimental one-group pre-test post-test design was adopted among 200 nursing students selected through simple random sampling from selected nursing colleges of Udaipur city, Rajasthan. Data were collected using a structured knowledge questionnaire. Video-assisted teaching was administered as the intervention. Descriptive and inferential statistics were used for data analysis.

Results:

The mean post-test knowledge score (18.23) was significantly higher than the mean pre-test score (13.89), with a mean difference of 4.34. The calculated *t* value (30.61) showed a statistically significant improvement ($p < 0.05$). Significant associations were found between pre-test knowledge scores and age, course pursuing, hepatitis B vaccination status, and history of NSI.

Conclusion:

Video-assisted teaching was effective in improving knowledge regarding needle stick injury and its preventive measures among nursing students and can be incorporated into nursing education to enhance occupational safety and reduce the incidence of NSIs.

Keywords: Needlestick Injury, Video-Assisted Teaching, Nursing Students, Occupational Safety, Infection Prevention

Introduction

Needlestick injuries (NSIs) represent a major occupational hazard in healthcare settings and are defined as accidental percutaneous injuries caused by needles or other sharp instruments contaminated with blood or potentially infectious body fluids. These injuries place healthcare workers at risk of acquiring serious blood-borne infections, particularly hepatitis B virus (HBV),

hepatitis C virus (HCV), and human immunodeficiency virus (HIV). In addition to blood, several other body fluids—including cerebrospinal, pleural, peritoneal, synovial, and amniotic fluids, as well as semen, vaginal secretions, saliva, and unfixed tissues—also pose a risk of infection.

Healthcare professionals frequently encounter NSIs during routine clinical procedures such as injections, intravenous cannulation, blood collection, suturing, and disposal of sharps. Nurses and nursing students are especially vulnerable due to their continuous patient contact and frequent handling of sharp instruments. Nursing students, in particular, are at increased risk as they begin clinical practice with limited technical skills, inadequate experience, and insufficient familiarity with infection prevention protocols.

The occupational risk associated with NSIs gained global attention following the emergence of HIV/AIDS, leading to the implementation of universal precautions and safety guidelines by the Centers for Disease Control and Prevention (CDC). Despite these measures and the availability of preventive strategies such as immunization, post-exposure prophylaxis (PEP), and safety-engineered devices, NSIs continue to occur at high rates, especially in developing countries where underreporting, heavy workloads, and limited training are common.

In India, NSIs remain a significant concern among nursing students due to high patient-to-staff ratios, inconsistent adherence to safety practices, and gaps between theoretical instruction and practical exposure. Educational strategies aimed at strengthening knowledge and safe practices are therefore essential. Video-assisted teaching (VAT) has emerged as an effective educational approach that enhances learning, reinforces procedural accuracy, and promotes compliance with safety protocols. However, evidence on the effectiveness of VAT in improving knowledge related to NSIs among nursing students in the Indian context remains limited, highlighting the need for further research.

Research Statement

"Evaluate the effectiveness of video assisted teaching on knowledge regarding needle stick injury and it's preventive measures among Nursing Students of selected nursing colleges of Udaipur, city, Rajasthan."

Objectives of the study

1. To assess the pre-test knowledge scores regarding needle stick injuries and their preventive measures among nursing students.
2. To evaluate the effectiveness of video-assisted teaching between pre-test and post-test knowledge scores regarding.
3. To find out the association between pre-test knowledge scores with selected socio-demographic variables.

Hypothesis

H_{o1}: There is no significant difference between the pre-test and post-test knowledge scores regarding needle stick injury and its preventive measures.

H_{o2}: There is no significant association between the pre-test knowledge scores and selected socio demographic variables.

Conceptual Framework

A conceptual framework provides a systematic and scientific structure that links existing knowledge with research findings and guides the investigator in achieving the study objectives. It represents the logical sequence of variables, activities, and outcomes involved in the research process.

The present study aimed to evaluate the effectiveness of video-assisted teaching on knowledge regarding needlestick injury and its preventive measures among nursing students in selected nursing colleges of Udaipur city, Rajasthan. The framework for this study was developed based on Ludwig von Bertalanffy's General System Theory (1968).

According to General System Theory, a system is composed of interrelated and interdependent components that interact to achieve a common goal. The theory identifies four core elements: input, throughput (process), output, and feedback.

In this study, the **input** comprised demographic variables and baseline knowledge of nursing students regarding needlestick injuries and preventive measures. The **throughput** involved the implementation of a structured video-assisted teaching programme. The **output** was the enhancement of knowledge levels following the intervention. **Feedback** was obtained through post-test assessment, which helped determine the effectiveness of the teaching programme and informed future educational strategies.

Thus, General System Theory provided an appropriate and logical framework to explain the teaching–learning process and evaluate the effectiveness of video-assisted teaching in improving knowledge among nursing students.

Materials and Methods:

Research Approach and Design

The study adopted a **quantitative quasi-experimental approach** to evaluate the effectiveness of video-assisted teaching on knowledge regarding needlestick injury and its preventive measures among nursing students. This approach enabled objective measurement of changes in knowledge following the intervention.

A **one-group pre-test–post-test quasi-experimental design** was used. Baseline knowledge was assessed before the intervention, followed by administration of the video-assisted teaching programme. Post-test assessment was conducted to determine the effectiveness of the intervention by comparing pre- and post-test knowledge scores.

Research Setting

The researcher conducted study in Nursing Colleges (sunrise college of nursing, maa gayatri college of nursing, venketeshwar college of nursing, arihent college of nursing) of Udaipur city**,** Rajasthan

Variables

The independent variable was the video assisted teaching on needle stick injury and its preventive measures. The dependent variable was nursing students' knowledge regarding needle stick injury and its preventive measures. Socio-demographic variables included In this study uch as Age in years, gender, course pursuing, training in prevention of NSI, vaccination for Hepatitis B, history of NSI.

Population and Sample

The population comprised students studying in g.n.m 1st year and bsc 2nd semester in nursing colleges of Udaipur city. The sample consisted of 200 nursing students selected from the 4th nursing colleges.

Sampling Technique

In the present study simple random sampling (lottery method) was used to select the participants from the eligible student lists of the selected colleges.

Sample Selection Criteria

Nursing students studying in class g.n.m. nursing1st year and b.sc. nursing 2nd year and willing to participate were included. Students unwilling to participate were excluded.

Tool Development

Section A: Socio-demographic Performa (age, gender, Course Pursuing, prior training on NSI/standard precautions, hepatitis-B vaccination status, history of NSI, source of information).

Section B: Structured knowledge questionnaire on NSI and its preventive measures comprising 28 multiple-choice questions on selected aspects. The selected aspects were:

- definition/introduction of NSI;
- causes and risk factors;
- standard precautions and safe handling of sharps;
- disposal of sharps and biomedical waste;
- post-exposure management and PEP;
- complications and prevention.

Reliability of the Tool

Content validity refers to the extent to which the items adequately represent the content domain. The tool (objectives, blueprint, and item checklist) was submitted to four experts in Medical-Surgical Nursing for review of relevance, clarity, and adequacy. Suggestions were incorporated and items refined. The Content Validity Index (CVI) was 100%, indicating excellent content validity.

Tool checked with kuder richardson method for the reliability (r value= **0.85**) which found reliable

Data Collection Procedure

Data were collected between **10th and 16th June 2025** from selected nursing colleges in Udaipur city, Rajasthan, including Sunrise College of Nursing, Maa Gayatri College of Nursing, Venkateshwar College of Nursing, and Arihant College of Nursing. Formal written permission was obtained from the principals of the respective institutions on **10th June 2025**, and informed consent was secured from all participating nursing students on the same day.

A pre-test (O_1) was administered using a structured knowledge questionnaire to assess baseline knowledge regarding needlestick injury and its preventive measures. Immediately after the pre-test, a **video-assisted teaching programme (X)** was delivered for **20–35 minutes**. The post-test (O_2) was conducted **seven days later**, on **16th June 2025**, using the same questionnaire to evaluate the effectiveness of the intervention. Data collection was carried out under standardized conditions, ensuring confidentiality and minimal disruption to academic schedules.

Data Analysis

Data analysis is the technique used to reduce, organize and give meaning to the data. In the present study, data obtained were analyzed on the basis of the objectives of the study using descriptive and inferential statistics. A master data sheet was prepared with responses given by subjects. The plan for data analysis was as follow: -

- **Descriptive Statistics:** Description of socio-demographic characteristics using frequency and percentage. Mean, median, standard deviation, and mean percentage for area-wise and overall pre-test and post-test knowledge scores.
- **Inferential Statistics:** Paired t-test to evaluate the effectiveness of the video-assisted teaching programme by comparing pre-test and post-test knowledge scores. Chi-square test to determine the association between pre-test knowledge categories and selected socio-demographic variables.

Result:

1. Effectiveness of video-assisted teaching programme on knowledge regarding NSI.

Test	Mean	Mean%	SD	Mean difference	t-value	df	p-value	Inference

Pre-test	13.89	46.3	3.28	4.34	30.61	199	<0.001	S*
Post-test	18.23	60.8	2.38					

S*- Significant at p <0.001 level of significant

The paired 't' test was computed to determine the effectiveness of the video-assisted teaching programme on knowledge regarding tobacco-related health hazards and its prevention among adolescents.

The following research hypothesis was stated:

H_{01}: There is no significant difference between pre-test and post-test knowledge scores regarding needle stick injury and its preventive measures among nursing students in selected nursing colleges of Udaipur city, Rajasthan.

The mean post-test knowledge score (18.23) was greater than the mean pre-test knowledge score (13.89). The mean difference between the pre-test and post-test scores was 4.34. The obtained 't' value was 30.61, which was significant at $p < 0.001$ level with df = 199.

Hence, the research hypothesis **H_{01}** was rejected. This indicates that the video assisted teaching was effective in increasing the knowledge of nursing students regarding needlestick injury and its preventive measures.

2. Area wise comparison of pre-test and post-test knowledge scores

AREA	**No.of question**	**Pre-test**		**Post-test**		**Mean difference**
		Mean	**SD**	**Mean**	**SD**	
General Information on Needle Stick Injuries (NSI)	10	4.66	1.06	6.37	1.97	1.71
Prevention and Management of Needle Stick Injuries	10	5.23	1.68	7.33	2.22	2.1
Post-Exposure Prophylaxis (PEP) and Treatment	8	4.00	0.97	4.53	1.57	0.53
TOTAL	**28**	**13.89**		**18.23**		**4.34**

the highest mean pre-test knowledge scores 5.23 with SD 1.68where as the highest mean post-test knowledge scores 7.33 with SD 2.22 was found in the area of Prevention and Management of Needle Stick Injuries, mean pre-test knowledge scores 4.66 with SD 1.06 as well as mean post-test knowledge scores 6.37 with SD 1.97 was found in area of General Information on Needle Stick Injuries (NSI), mean pre-test knowledge scores 4.00 with SD 0.97 as well as post-test knowledge scores 4.53 with SD 1.57 was found in area of Post-Exposure Prophylaxis (PEP) and Treatment. It was found that the mean post-test knowledge scores were higher than that of pre-test knowledge scores which indicates considerable increase in the knowledge regarding prevention of needle stick injury and its preventive measures among nursing students at selected nursing colleges, Udaipur.

The post-test knowledge scores was higher than the pre-test knowledge scores it indicate that the H_{01}- There is no significance difference between the pre-test and post-test knowledge scores among nursing students was rejected.

3. Findings related to Association between pre-test knowledge scores and selected socio-demographic variables.

Socio demographic variables	Below median	Above median	Total	df	Chi square	Chi square table value	P value	Inference
Age in years								
18-20	82	66	148	3	8.06	7.81	0.001	S
21 to 23	27	24	51					
24 to 25	1	0	1					
Above 25	0	0	0					
TOTAL	**110**	**90**	**200**					
Gender								
Female	56	58	114	1	2.66	3.84	0.24	NS
Male	43	43	86					
TOTAL	**99**	**101**	**200**					
Course Pursuing								
B.SC. (N)	40	55	95	1	4.09	3.84	0.02	S
G.N.M	50	55	105					
TOTAL	**90**	**110**	**200**					
Training in prevention of NSI								
NO	80	94	174	1	3.28	3.84	0.19	NS
YES	20	6	26					
TOTAL	**100**	**100**	**200**					
Vaccinated for Hep. B								
No	91	66	157	1	5.22	3.84	0.1	S
Yes	18	25	43					
TOTAL	**109**	**91**	**200**					
Victim for NSI								
No	82	82	164	1	4.96	3.84	0.01	S
Yes	18	18	36					
TOTAL	**100**	**100**	**200**					

S-Significant, NS- Non Significant

H_{02} - There is no significant association between pre-test knowledge scores with selected socio-demographic variables.

The chi-square test was carried out to determine the association between pre-test knowledge scores of nursing students and their selected socio-demographic variables. The overall statistical findings revealed that the variables such as **age in years ($\chi^2 = 8.6$, $p = 0.01$), Course Pursuing ($\chi^2 = 4.09$, $p = 0.02$), Vaccinated for Hep. B ($\chi^2 = 5.22$, $p = 0.001$), Victim for NSI ($\chi^2 = 4.96$, $p = 0.001$),** were found to be statistically significant.

On the other hand, the variables such as **gender ($\chi^2 = 2.66$, $p = 0.24$), Training in prevention of NSI ($\chi^2 = 3.28$, $p = 0.19$),** were found to be statistically non-significant.

Thus, it can be concluded that there is a **partial association** between pre-test knowledge scores and selected socio-demographic variables. Hence, the research hypothesis **H_{02} was partially accepted**, indicating that some socio-demographic variables have a

significant influence on the pre-test knowledge scores of nursing students regarding needle stick injury and its preventive measures.

Conclusion

This study highlights the evaluate the effectiveness of video-assisted teaching programme on knowledge regarding needle stick injury and its preventive measures among nursing students in selected nursing colleges of Udaipur city.

The study found that most nursing students were young (18–20 years), predominantly female, and more than half were GNM students. Prior to the intervention, their knowledge regarding needle-stick injuries (NSI) and preventive measures was inadequate. The highest improvement was seen in the area of Prevention and Management of NSI, with mean pre-test scores of 5.23 ± 1.68 increasing to 7.33 ± 2.22 post-intervention. The video-assisted teaching programme proved highly effective in enhancing knowledge, with significant gains observed after the intervention. Knowledge improvement was significantly associated with age, course of study, vaccination status, and history of NSI, while gender and prior training showed no significant impact. Overall, the study concludes that video-assisted teaching is an effective strategy to improve nursing students' awareness and understanding of NSI and its prevention.

Limitations

- The study was limited to nursing students of selected nursing colleges in Udaipur district.
- The study was restricted to a sample size of 200, which limits generalization.
- The study focused only on knowledge assessment, not on practice or skill components.

Suggestions

Based on the study findings, the following suggestions are proposed:

- A similar study can be conducted among nurses and other health care workers in different hospital settings.
- A study with a larger sample size can be undertaken to enhance the generalizability of results.
- An experimental study with control and experimental groups can be conducted to compare the effectiveness of different teaching methods.
- Specific protocols and guidelines can be developed and validated for prevention and post-exposure management of NSI.
- Longitudinal studies can be carried out to assess knowledge retention and practice compliance regarding NSI prevention.

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