



A STUDY TO ASSESS THE EFFECTIVENESS OF VAT ON KNOWLEDGE AND PRACTICES REGARDING MEDICATION SAFETY PROTOCOLS AMONG NURSING OFFICERS AT SELECTED HOSPITAL OF BHOPAL

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Abstract: This study assesses the impact of Video-Assisted Teaching (VAT) on the knowledge and practices related to medication safety protocols among nursing officers at a Bhopal hospital. Medication safety is crucial for patient safety, and nursing officers play a vital role in administration and monitoring. A pre-experimental design involving 60 nursing officers was implemented, utilizing structured questionnaires and observation checklists before and after VAT. Results showed a significant increase in mean knowledge (from 12.35 to 21.75) and practice scores (from 7.85 to 13.42), with strong correlation ($r = 0.815$) between post-test knowledge and practice. The study concludes VAT effectively enhances nursing education on medication safety, suggesting its integration into training programs to bolster patient safety.

Video-Assisted Teaching, Medication Safety Protocols, Knowledge, Practice, Nursing Officers, Patient Safety, Medication Error.

I. INTRODUCTION

Patient safety is a fundamental component of quality healthcare, with medication safety playing a crucial role in preventing errors that could lead to severe adverse drug events. Nurses, being primary caregivers, are directly responsible for ensuring proper medication administration, monitoring, and adherence to safety protocols. (Agarwal, A. (2017). Healthcare systems worldwide aim to provide efficient, evidence-based, and ethical care to patients. However, despite advanced medical technologies, clinical expertise, and rigorous training, errors still occur, leading to significant risks for patients. Medical errors can range from misdiagnosis to surgical complications, but one of the most common and preventable categories of medical errors is medication-related mistakes. (Bapuji, H. ,2018). Medication safety involves preventing, identifying, and managing medication errors to ensure that drugs are prescribed, dispensed, and administered appropriately. Given the vast number of medications available, their varied effects, and possible drug interactions, ensuring

their proper use is essential to maintaining patient safety and optimal health outcomes. (Gupta, S. (2019). Nurses are the backbone of patient care, responsible for ensuring effective communication, comprehensive assessments, and patient-centered interventions. Their proximity to patients allows them to monitor medication effectiveness, recognize adverse reactions, and intervene when necessary. (Jalan, S., 2021). To maximize patient safety and minimize medication errors, healthcare institutions must ensure nurses receive proper training and follow standardized safety guidelines. As healthcare systems evolve, effective educational strategies must be integrated to ensure nursing officers possess strong foundational knowledge and practical skills in medication safety protocols (MSPs). Video-Assisted Teaching (VAT) is a modern instructional approach that utilizes audiovisual learning techniques to enhance comprehension, engagement, and application of essential protocols. (Bhandari, S. (2020).) The need for this study is underscored by the persistent global challenge of medication errors, which significantly contribute to patient harm, mortality, and substantial financial burdens on healthcare systems. ¹ Nurses play a critical and indispensable role in medication administration, often serving as the final safety barrier. ² Despite their pivotal position, medication errors among nurses remain prevalent, with reported rates as high as 44.4%. ³ There is a recognized need to enhance nurses' medication safety competence, particularly in areas like dosage calculation and self-reflective attitudes. ¹ Therefore, assessing the effectiveness of specific training interventions, such as VAT, on the knowledge and practices of nursing officers regarding medication safety protocols is crucial. This research will provide valuable insights to develop and implement targeted educational strategies, ultimately improving patient safety outcomes in hospital settings. This study seeks to evaluate the effectiveness of VAT in improving knowledge and practices regarding Medication Safety Protocols among Nursing Officers in India, with a specific focus on selected nursing colleges in Bhopal.

Objectives of the Study

This study is planned to achieve the following objectives:

1. To assess the knowledge of Nursing Officers on Medication Safety Protocols (MSPs).
2. To find out the practice of Nursing Officers in implementing Medication Safety Protocols.
3. To analyze the correlation between Knowledge & Practices regarding Medication Safety Protocols among Nursing Officers.

Research Hypothesis

The study examines the following hypotheses:

- **H₀ (Null Hypothesis):** There is no significant correlation between nursing officers' knowledge and practices regarding MSPs.
- **H₁ (Alternative Hypothesis):** There is a significant correlation between nursing officers' knowledge and practices regarding MSPs.

2.2 Review of Literature-

- Dr. Pallavi Pathania et al. (2021) conducted an interventional study titled "Assessment of the Effectiveness of Video-Assisted Teaching (VAT) Programme on Knowledge Regarding Joint Pain & Its Prevention Among B.Sc. Nursing Students of Shimla Nursing College, Annandale, Shimla, H.P." The study aimed to evaluate the effectiveness of Video-Assisted Teaching (VAT) in improving nursing students' knowledge regarding joint pain and its prevention. A pre-experimental one-group pre-test and post-test research design was adopted, involving 80 B.Sc. Nursing students selected through convenient sampling. A structured questionnaire was used to assess knowledge before and after the VAT intervention. The findings showed a marked improvement in knowledge levels following the intervention. The mean knowledge score increased from 14.19 in the pre-test to 18.96 in the post-test, with a mean difference of 4.78. The calculated t-value of 18.35 was statistically significant ($p < 0.001$), demonstrating that VAT effectively enhanced students' knowledge regarding joint pain and preventive measures. The researchers recommended incorporating VAT into nursing education to strengthen theoretical understanding and improve knowledge retention.

S. Vijaya Malar (2019) conducted a quasi-experimental study titled "A Study to Assess the Effectiveness of VAT on Knowledge Regarding Janani Suraksha Yojana among Mothers of Selected Rural Area at Bangalore, Karnataka, India." The study aimed to determine the effectiveness of Video-Assisted Teaching in improving mothers' knowledge regarding Janani Suraksha Yojana (JSY). The research was conducted among 60 antenatal mothers attending Abbikarea Primary Health Centre, Bangalore, who were selected through simple random sampling. Data were collected using a structured questionnaire before and after a 30-minute VAT session conducted in Kannada using videos, flashcards, and PowerPoint presentations. The findings revealed that mothers had inadequate knowledge before the intervention, while post-test scores showed a significant improvement in awareness regarding JSY benefits, cash incentives, referral services, and institutional deliveries. Statistical analysis using the paired t-test demonstrated a highly significant improvement ($p = 0.001$). The study concluded that VAT is an effective educational strategy for enhancing maternal awareness about government health programmes and recommended its integration into rural antenatal health education services.

Barkha Devi, Bidita Khandelwal, and Mridula Das (2019) conducted a quasi-experimental pre-test and post-test control group study titled "Comparison of the Effectiveness of Video-Assisted Teaching Program and Traditional Demonstration on Nursing Students' Learning Skills of Performing Obstetrical Palpation." The study was carried out among 60 third-year B.Sc. Nursing students of Sikkim Manipal University, Gangtok, who were randomly allocated to either a Video-Assisted Teaching group or a Traditional Demonstration group. Students' clinical skills were evaluated using a validated self-designed rating scale with a Cronbach's alpha reliability coefficient of 0.78. The results indicated significant improvement in both groups following the intervention. However, the traditional demonstration group achieved significantly higher post-test skill scores than the VAT group ($p = 0.001$), suggesting that while VAT effectively enhances theoretical understanding and reinforces learning, traditional demonstration remains superior for developing psychomotor and clinical skills. The researchers recommended adopting a blended teaching approach combining VAT with practical demonstrations for optimal nursing education outcomes.

Marianne A. Chui, Pohjanoksa-Mäntylä, and Snyder (2020), in their study "Improving Medication Safety in Varied Health Systems," emphasized that medication errors are frequently associated with poor communication, inadequate professional knowledge, workflow interruptions, and system-related factors. The researchers highlighted the importance of continuous education, structured training programmes, and standardized medication safety practices to improve nurses' adherence to safe

medication administration protocols. The study concluded that ongoing educational interventions play a significant role in reducing medication errors and improving patient safety across healthcare settings.

Johnson and Young (2019) investigated the effectiveness of structured educational interventions on nurses' knowledge and practice regarding medication administration. Their findings demonstrated that systematic educational programmes significantly improved nurses' understanding of medication safety principles and enhanced their compliance with safe medication administration practices. The study emphasized that continuous professional education is essential for minimizing medication errors and improving the quality of patient care.

The World Health Organization (2017) launched the global patient safety challenge "*Medication Without Harm*," aiming to reduce severe avoidable medication-related harm worldwide. The initiative highlighted the importance of standardized medication safety protocols, healthcare professional training, improved communication, and patient involvement in reducing medication errors. The WHO strongly advocated integrating evidence-based educational strategies into nursing practice, particularly in developing countries where medication errors remain a major public health concern.

Sharma et al. (2021) conducted a study in the Indian healthcare context and reported that many nursing officers lacked adequate knowledge of updated medication safety protocols because of insufficient training opportunities. The researchers observed that inadequate continuing education contributed to unsafe medication administration practices in hospitals. The study recommended regular in-service educational programmes, competency-based training, and periodic skill assessments to strengthen medication safety among nursing professionals.

Patel et al. (2022) examined the effectiveness of Visual Aided Teaching (VAT) in improving healthcare professionals' understanding of medication safety protocols. The intervention-based study found that integrating visual teaching aids into educational programmes significantly enhanced participants' knowledge retention, comprehension of complex medication safety concepts, and practical application of safety protocols. The researchers concluded that VAT represents an effective and innovative teaching strategy that can strengthen nurses' competency and improve adherence to medication safety standards.

The above-reviewed literature demonstrates that Video-Assisted Teaching is an effective educational approach for improving knowledge, awareness, and learning outcomes among nursing students, mothers, and healthcare professionals. Although traditional demonstration remains more effective for developing psychomotor skills, VAT substantially enhances cognitive learning, knowledge retention, and understanding of healthcare concepts. Furthermore, existing literature on medication safety emphasizes the need for continuous education and innovative teaching methods to improve nurses' competency in safe medication administration. These findings provide a strong scientific foundation for the present study, which aims to assess the effectiveness of Video-Assisted Teaching on knowledge regarding medication safety protocols among nursing officers working in selected hospitals of Bhopal.

2.3 Research Methodology:-The present study adopted a quantitative research approach using a pre-experimental one-group pre-test and post-test research design to assess the effectiveness of Video-Assisted Teaching (VAT) on knowledge and practices regarding medication safety protocols among nursing officers in selected hospitals of Bhopal. Research methodology provides a systematic framework for conducting scientific investigations and ensures the validity, reliability, and accuracy of the findings. In this study, the same group of participants was assessed before and after the intervention. Initially, a pre-test (O_1) was conducted using a structured knowledge questionnaire and an observation checklist to assess the existing level of knowledge and practices regarding medication safety protocols. This was followed by the Video-Assisted Teaching (X) intervention, after which a post-test (O_2) was conducted seven days later using the same tools to determine the effectiveness of the intervention. The symbolic representation of the research design was $O_1 \rightarrow X \rightarrow O_2$, where O_1 represents the pre-test assessment, X denotes the Video-Assisted Teaching intervention, and O_2 represents the post-test assessment.

3.1 Population and Sample

The target population comprised nursing officers working in selected hospitals in India, while the accessible population consisted of nursing officers employed in selected hospitals of Bhopal. A total of 60 nursing officers were selected using the simple random sampling technique. The inclusion criteria included nursing officers currently employed in hospital settings, willing to participate in the study, and having basic exposure to medication safety protocols. Nursing officers who were on leave during the period of data collection or those unwilling to provide informed consent were excluded from the study.

3.2 Theoretical framework-Based on General System Theory

The conceptual framework of the present study is based on General System Theory, introduced by Ludwig von Bertalanffy. General System Theory explains that every system has three major components: input, process or throughput, and output, along with feedback. This model is commonly used in nursing research because it helps to explain how a planned educational intervention brings change in knowledge, practice and behaviour. In the present study, nursing officers are considered as an open system. Their existing knowledge and practices regarding medication safety protocols are influenced by their demographic characteristics, professional experience, previous exposure to training and clinical work environment. Video-Assisted Teaching acts as the planned educational intervention that provides information, demonstration, visual learning and reinforcement regarding safe medication administration practices. After the intervention, the expected outcome is improvement in knowledge and practice regarding medication safety protocols.

3.4 Statistical tools and econometric models

The collected data were organized, coded, and entered into Microsoft Excel and analyzed using appropriate statistical software. Both descriptive and inferential statistical methods were employed to interpret the findings. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize the demographic characteristics of the nursing officers and to describe the pre-test and post-test knowledge and practice scores regarding medication safety protocols. Inferential statistics were applied to determine the effectiveness of the Video-Assisted Teaching (VAT) intervention. The paired *t*-test was used to compare the mean pre-test and post-test scores and to assess whether the observed differences were statistically significant. Correlation analysis was also performed to examine the relationship between improvements in knowledge and practice following the intervention. The level of statistical significance was set at $p < 0.05$.

Ethical Considerations

Prior to the commencement of the study, ethical approval was obtained from the Institutional Ethics Committee. Permission to conduct the study was also obtained from the concerned hospital authorities. Written informed consent was obtained from all participants after explaining the purpose and procedure of the study. Confidentiality and anonymity of the participants were strictly maintained throughout the research process, and all collected information was used solely for research purposes. Participation in the study was entirely voluntary, and the participants were informed of their right to withdraw from the study at any stage without any penalty or consequences.

Limitations of the Study

The present study had certain limitations. The sample size was limited to 60 nursing officers, which may restrict the generalization of the findings to a larger population. The duration between the pre-test and post-test was only seven days; therefore, the study assessed only the immediate effectiveness of the intervention and did not evaluate long-term retention of knowledge and practices. Furthermore, the use of a pre-experimental one-group pre-test and post-test design without a control group limited the comparison of Video-Assisted Teaching with other teaching methods.

4.1. RESULTS AND DISCUSSION

Data analysis is a crucial aspect of research that enables the interpretation of findings, validation of hypotheses, and the formulation of recommendations. This chapter presents the analysis of data collected through pre-test and post-test questionnaires and practice checklists, measuring the effectiveness of Video-Assisted Teaching (VAT) on nursing officers' knowledge and practices regarding medication safety protocols in a selected hospital in Bhopal. The findings are analyzed using descriptive statistics, paired t-test, and correlation analysis.

4.2 Demographic Characteristics of Participants

Table 1: Distribution of Participants by Demographic Variables

Demographic Variable	Categories	Frequency (N=60)	Percentage (%)
Age Group	20-30 years	15	25%
	31-40 years	22	36.67%
	41-50 years	18	30%
	51+ years	5	8.33%
Gender	Male	38	63.33%
	Female	22	36.67%
Education Level	Diploma	28	46.67%
	Bachelor's Degree	20	33.33%

	Master's Degree	12	20%
Years of Experience	0-5 years	14	23.33%
	6-10 years	24	40%
	11-15 years	16	26.67%
	16+ years	6	10%

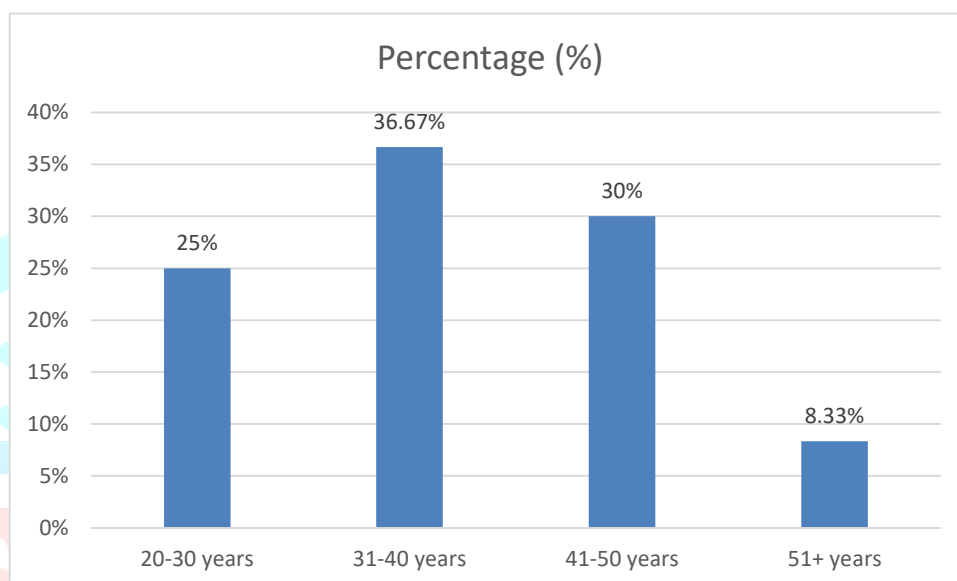


Fig.4.1 Age group

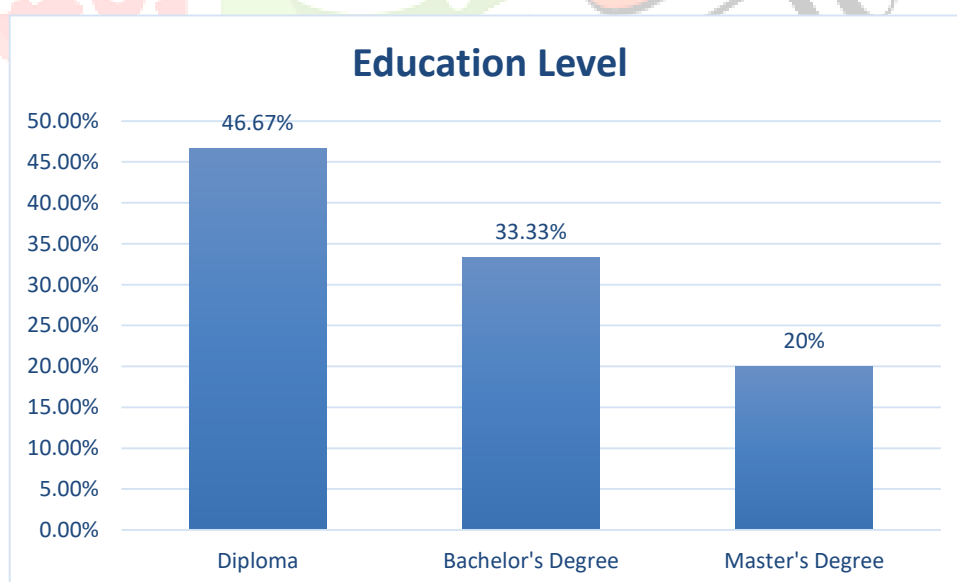


Fig.4.2 Education Level

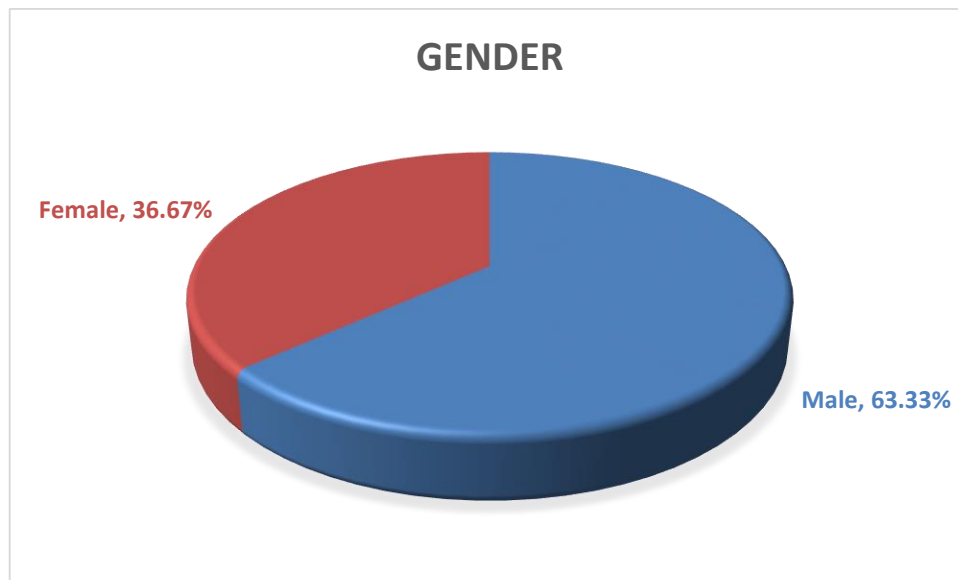


Fig. 4.3 Gender

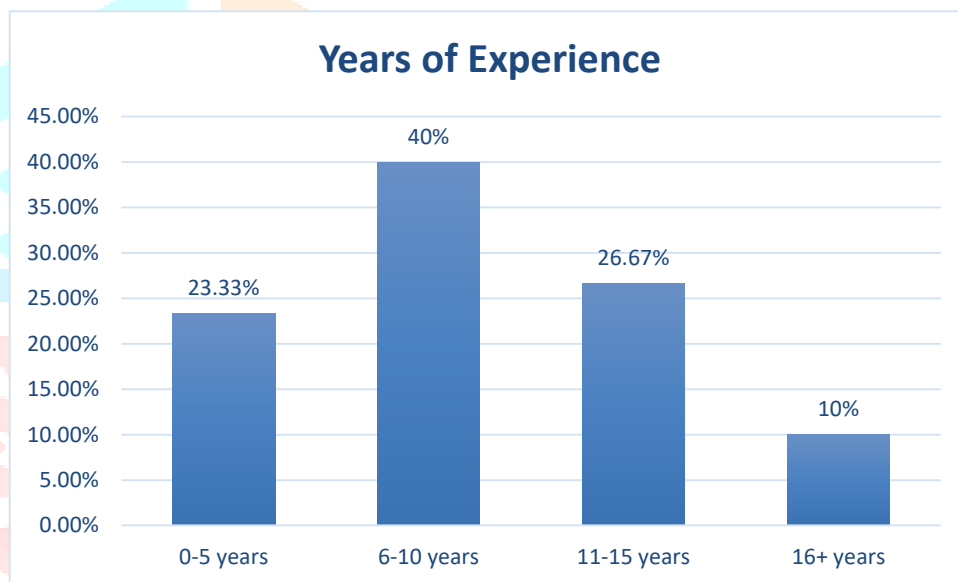


Fig. 4.4 Years of experience

Interpretation:

- The majority of participants (63.33%) were male nursing officers.
- Most nursing officers had 6-10 years of experience (40%), which reflects a moderately experienced workforce.
- 46.67% held a diploma, while 33.33% had a bachelor's degree, indicating varied educational backgrounds.

4.3 Pre-Test and Post-Test Knowledge Scores

Table 2: Comparison of Pre-Test and Post-Test Knowledge Scores

Variable	Mean $\pm$ SD (Pre-Test)	Mean $\pm$ SD (Post-Test)	Mean Difference	t-value	p-value
Knowledge Score	12.35 $\pm$ 2.55	21.75 $\pm$ 3.02	9.40	8.23	0.001 (Significant)

Interpretation:

- The post-test mean score (21.75 $\pm$ 3.02) showed a significant increase compared to the pre-test mean (12.35 $\pm$ 2.55).
- The paired t-test value (8.23, $p < 0.001$) confirms that the VAT intervention significantly improved nursing officers' knowledge.
- Thus, the null hypothesis (H_0 : No significant impact of VAT) is rejected, proving that VAT positively influences knowledge acquisition regarding medication safety protocols.

4.4 Pre-Test and Post-Test Practice Scores

Table 3: Comparison of Pre-Test and Post-Test Practice Scores

Variable	Mean $\pm$ SD (Pre-Test)	Mean $\pm$ SD (Post-Test)	Mean Difference	t-value	p-value
Practice Score	7.85 $\pm$ 2.10	13.42 $\pm$ 2.45	5.57	7.95	0.001 (Significant)

Interpretation:

- The post-test mean practice score (13.42 $\pm$ 2.45) showed a considerable improvement compared to the pre-test score (7.85 $\pm$ 2.10).
- The paired t-test value (7.95, $p < 0.001$) confirms the effectiveness of VAT in enhancing nursing officers' adherence to medication safety protocols.
- The null hypothesis (H_0 : No significant impact of VAT on practices) is rejected, proving VAT effectively improves practical application of medication safety measures.

4.5 Correlation Between Knowledge and Practice

Table 4: Correlation Analysis Between Knowledge and Practice Post-VAT Intervention

Variable	Mean $\pm$ SD	Pearson Correlation (r)	p-value	Significance
Knowledge	21.75 $\pm$ 3.02	0.815	0.001	Strong Positive Correlation
Practice	13.42 $\pm$ 2.45	-	-	-

Interpretation:

- The **Pearson correlation coefficient** ($r = 0.815$, $p < 0.001$) indicates a **strong positive correlation** between **knowledge and practice**.
- This suggests that **nursing officers with higher knowledge scores demonstrated better practices** regarding medication safety.
- The findings support the study's **third objective**—to analyze the correlation between knowledge and practices, confirming that **increased knowledge directly improves adherence to medication safety protocols**.

4.6 Hypothesis Testing Summary

Hypothesis	Result
H ₀ (Null Hypothesis): VAT has no significant impact on nursing officers' knowledge and practices regarding MSPs.	Rejected
H ₁ (Alternative Hypothesis): VAT significantly improves nursing officers' knowledge and practices regarding MSPs.	Accepted

Overall Interpretation:

1. VAT significantly improved knowledge scores, as demonstrated by the mean increase from 12.35 to 21.75, with $t=8.23$, $p<0.001$.
2. VAT significantly enhanced practice scores, confirmed by the mean rise from 7.85 to 13.42, with $t=7.95$, $p<0.001$.
3. A strong positive correlation ($r=0.815$) between knowledge and practice confirms that higher knowledge leads to improved adherence to MSPs.

The findings conclusively demonstrate that Video-Assisted Teaching (VAT) is highly effective in improving nursing officers' knowledge and practices regarding Medication Safety Protocols (MSPs) in the selected hospital in Bhopal. The significant increase in post-test scores and strong correlation between knowledge and practices validate the effectiveness of VAT as a training tool. These results support the integration of VAT into nursing education and professional training programs to enhance patient safety outcomes.

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