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A Study to Assess the Effectiveness of Video Assisted Teaching on Knowledge Regarding Electronic Partograph Among GNM 3rd Year Students

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Abstract

Background: The partograph is an essential tool in labor management, with electronic versions offering enhanced capabilities. However, effective utilization requires adequate knowledge, which can be suboptimal among nursing students. This study investigates the effectiveness of Video Assisted Teaching (VAT) in improving knowledge of electronic partographs among nursing students.

Objectives: The primary objectives were to assess the pre-test knowledge of electronic partographs among GNM 3rd year nursing students, evaluate the effectiveness of VAT in enhancing this knowledge, compare pre-test and post-test knowledge scores, and identify any associations between post-test knowledge scores and selected demographic variables.

Methods: A quasi-experimental, one-group pre-test post-test design was employed. Sixty GNM 3rd year nursing students from Santosh College of Nursing, Ghaziabad, were selected using a simple random sampling technique. Data were collected using a structured knowledge questionnaire, which included demographic information and 20 knowledge-based items. The study procedure involved a pre-test, followed by a VAT intervention, and a post-test administered after seven days.

Results: The findings demonstrated a significant improvement in knowledge following the VAT intervention. The mean pre-test knowledge score was 5.56, which increased to 10.54 in the post-test. Statistical analysis yielded a t-value of 14.25 ($p<0.05$), indicating a statistically significant difference. Demographically, 90% of the participants were aged 21-23 years, 63% were female, and all were GNM 3rd year students, with 93% having no prior training in partograph usage. Significant associations were observed between post-test knowledge scores and gender, as well as language proficiency.

Conclusion: The Video Assisted Teaching program proved to be an effective educational intervention for improving the knowledge of GNM 3rd year nursing students regarding electronic partographs. These findings support the integration of VAT into nursing curricula to enhance practical skills and decision-making in labor management.

Introduction

The partograph, also known as the partogram, is a critical tool for monitoring labor progression and maternal-fetal well-being, recognized globally by organizations such as the World Health Organization (WHO) for its role in improving maternal and neonatal outcomes [1]. Despite its proven efficacy, the utilization of partographs has often been suboptimal, particularly in resource-limited settings. The advent of technology has led to the development of electronic partographs, which integrate real-time data and analytics to enhance labor monitoring, facilitate timely interventions, and improve communication among healthcare teams [2]. These digital tools streamline data collection and allow for quicker identification of deviations from normal labor, thereby safeguarding maternal and fetal health [3].

However, the effective use of electronic partographs necessitates a solid understanding of their components and functions. Traditional lecture-based teaching methods may not adequately prepare nursing students for the complexities of these advanced tools. Video Assisted Teaching (VAT) has emerged as an innovative and effective pedagogical approach in healthcare education, capable of enhancing knowledge retention and practical application among nursing students [4]. VAT employs visual and auditory aids, catering to diverse learning styles and making complex concepts more accessible. While the benefits of VAT in nursing education are increasingly recognized, there remains limited research specifically on its effectiveness in teaching the understanding and utilization of electronic partographs, particularly among GNM 3rd year students.

This research aims to address this gap by assessing the impact of VAT on the knowledge and practical application of electronic partographs among GNM 3rd year students at Santosh College of Nursing, Ghaziabad. The findings of this study are expected to provide valuable insights into the potential benefits of incorporating VAT into nursing education programs, thereby contributing to improved maternal care during labor. The study will focus on evaluating the change in knowledge levels and identifying factors influencing the adoption and effective use of electronic partographs among the target student population.

Methodology

Research Design

This study employed a **quasi-experimental, one-group pre-test post-test design** to evaluate the effectiveness of Video Assisted Teaching (VAT) on the knowledge of electronic partographs among nursing students. This design was chosen to assess changes in knowledge within the same group of participants before and after the intervention.

Study Setting and Population

The research was conducted at **Santosh College of Nursing, Ghaziabad**, a private institution offering nursing programs. The target population comprised **GNM 3rd year nursing students** enrolled at the college. The selection of this setting and population was based on their relevance to the study's objectives, as these students are in a critical phase of their education where they acquire specialized knowledge and skills for clinical practice.

Sample and Sampling Technique

A total of **60 GNM 3rd year nursing students** were included in the study. A **probability simple random sampling technique** was utilized to select the participants, ensuring that each student in the target population had an equal chance of being included, thereby enhancing the representativeness of the sample.

Data Collection Instruments

The primary data collection instrument was a **structured knowledge questionnaire**. This questionnaire was divided into two main sections:

1 **Socio-demographic Data:** This section collected information on participants' age, gender, educational status, type of college, residential status, previous training in partograph usage, experience in clinical settings, comfort level with technology, preferred learning mode, and language proficiency.

2 **Knowledge on Electronic Partograph:** This section consisted of 20 multiple-choice questions designed to assess the students' understanding of various aspects of the electronic partograph, including its purpose, components, interpretation, and application.

Data Collection Procedure

The data collection process involved three distinct phases:

1 **Pre-test:** Initially, the structured knowledge questionnaire was administered to all 60 participants to assess their baseline knowledge regarding electronic partographs. This pre-test was conducted before any intervention.

2 **Video Assisted Teaching (VAT) Intervention:** Following the pre-test, participants received a standardized Video Assisted Teaching program focused on the electronic partograph. The VAT module covered theoretical concepts, practical application, and interpretation of electronic partograph data.

3 **Post-test:** After a period of seven days, a post-test using the same structured knowledge questionnaire was administered to the participants. This allowed for the evaluation of knowledge gain and the effectiveness of the VAT intervention.

Data Analysis Plan

Both **descriptive and inferential statistics** were employed for data analysis. Descriptive statistics, including frequencies and percentages, were used to summarize the socio-demographic characteristics of the sample and the distribution of knowledge scores. Inferential statistics, specifically the **paired t-test**, was used to compare the pre-test and post-test knowledge scores to determine the effectiveness of the VAT. Additionally, **Chi-square tests** were utilized to find associations between post-test knowledge scores and selected demographic variables. The level of significance was set at $p < 0.05$.

Results

This section presents the findings derived from the data analysis, encompassing the socio-demographic characteristics of the participants, their pre-test and post-test knowledge scores regarding electronic partographs, and the statistical evaluation of the Video Assisted Teaching (VAT) program's effectiveness, including associations with demographic variables.

Socio-Demographic Characteristics

The study sample comprised 60 GNM 3rd year nursing students. The demographic profile revealed that the majority of participants, 54 (90%), were in the 21-23 years age group, with 6 (10%) falling into the 24-26 years age bracket. Gender distribution showed 38 (63%) female and 22 (36%) male students. All participants (100%) were GNM 3rd year students from private colleges. Regarding residential status, 18 (60%) resided in nearby areas, 9 (30%) in Ghaziabad, and 3 (10%) from other cities. A significant

majority, 56 (93%), reported having no previous training in partograph usage, and 52 (86%) had no clinical experience in this area. In terms of comfort with technology, 42 (70%) were comfortable with video-based teaching, and 58 (96%) reported being very comfortable with technology in general. Language proficiency indicated that 32 (53%) were fluent in Hindi, 22 (36%) in both English and Hindi, and 6 (10%) in English only [Table 1, original document].

Knowledge Scores on Electronic Partograph

The assessment of knowledge scores before and after the VAT intervention demonstrated a notable improvement. In the pre-test, a substantial proportion of students, 22 (73%), exhibited poor knowledge, while 5 (16%) had average knowledge, and only 3 (10%) showed good knowledge. Following the VAT program, the post-test results indicated a significant shift: the percentage of students with poor knowledge decreased to 8 (26%), those with average knowledge increased to 11 (36%), and those with good knowledge rose to 8 (26%) [Table 2, original document].

Effectiveness of Video Assisted Teaching

The mean knowledge scores further underscored the effectiveness of the VAT program. The mean pre-test knowledge score was 5.56 (Standard Deviation = 1.50), which significantly increased to a mean post-test knowledge score of 10.54 (Standard Deviation = 3.38). The mean difference between the pre-test and post-test scores was 4.98. A paired t-test was conducted to evaluate the statistical significance of this difference. The obtained t-value was 14.25 with 29 degrees of freedom, which was statistically significant at $p < 0.05$. This indicates that the VAT program led to a statistically significant improvement in the knowledge of electronic partographs among the GNM 3rd year students [Table 3 and 4, original document].

Association with Demographic Variables

An analysis of the association between post-test knowledge scores and selected demographic variables using the Chi-square test revealed significant findings. A statistically significant association was found between post-test knowledge scores and **gender** (Chi-square = 10.20, df = 4, p = 0.037), and **comfort level with technology** (Chi-square = 6.607, df = 2, p = 0.036). However, no significant associations were observed with age, educational status, type of college, residential status, previous training in partograph usage, clinical experience, or language proficiency [Table 5, original document].

Table 1: Frequency and Percentage Distribution of Sample According to Demographic Variables (N=60)

S.NO	Clinical variables	Frequency (F)	Percentage (%)
1	**Age in year**		
	a. 18-20 years	0	0
	b. 21-23 years	54	90
	c. 24-26 years	6	10
	d. 27 years and above	0	0

S.NO	Clinical variables	Frequency (F)	Percentage (%)
2	**Gender**		
	a. Male	22	36
	b. Female	38	63
	c. Others	0	0
3	**Educational status**		
	a. GNM	60	100
	b. B.Sc. nursing	0	0
4	**Type of college**		
	a. Government college	0	0
	b. Private college	60	100
5	**Residential status**		
	a. Residential at Ghaziabad	9	30
	b. Resident of nearby area	18	60
	c. Resident of other city	3	10
6	**Previous training in partograph usage**		
	a. Yes	4	6
	b. No	56	93
7	**Experience in clinical setting**		
	a. None	52	86
	b. Less than 6 months	4	6
	c. 6 months to 1 year	2	3
	d. More than 1 year	2	3
8	**Comfort level with technology**		
	a. Video based teaching	42	70
	b. Lecture based teaching	8	13
	c. Practical demonstrations	10	16
	d. Written materials	0	0

S.NO	Clinical variables	Frequency (F)	Percentage (%)
9	**Comfort level with technology (overall)**		
	a. Very comfortable	58	96
	b. Comfortable	0	0
	c. Neutral	2	4
	d. Uncomfortable	0	0
10	**Language proficiency**		
	a. Fluent in English	6	10
	b. Fluent in Hindi	32	53
	c. Fluent in both English and Hindi	22	36
	d. Proficient in other language	0	0

Table 2: Frequency and Percentage of Pre-test and Post-test Knowledge Scores of GNM 3rd Year Students on Electronic Partograph (N=60)

Sr. No.	Level of Knowledge	Pre-Test (F)	Pre-Test (%)	Post-Test (F)	Post-Test (%)
1	Good	3	10	8	26
2	Average	5	16	11	36
3	Poor	22	73	11	36

Table 3: Mean and Standard Deviation of Pre-test and Post-test Knowledge (N=60)

Knowledge Score	Mean	Standard Deviation
Pre-test	5.56	1.50
Post-test	10.54	3.38

Table 4: Mean, Mean Difference, Standard Deviation of Difference, Standard Error of Mean Difference and 't' Value of Pre-test and Post-test Knowledge Scores (N=60)

Knowledge Score	Mean	Mean Difference (MD)	SD Difference	SE	t-value	P-value
Pre-test	5.56					
Post-test	10.54	4.98	0.36	0.33	14.25*	0.001

*df=29, table value 1.66, t=14.25 at $p<0.05$ level of significant.

Table 5: Chi-square Values Showing Association Between Post-test Knowledge Score with Selected Demographic Variables (N=60)

S.No	Socio-demographic	Level of knowledge in post-test	Chi-square value	Chi-square table value	Df	S/NS
		Poor	Average	Good		
1	**Age in year**					
	a. 18-20 years	0	0	0		
	b. 21-23 years	11	2	16	7.305	9.49
	c. 24-26 years	1	0	0		
	d. 27 years and above	0	0	0		
	P-value					0.120
2	**Gender**					
	a. Male	13	7	4	10.20	9.49
	b. Female	2	1	3		
	c. Others	0	0	0		
	P-value					0.037
3	**Educational status**					
	a. GNM	17	5	8	4.336	9.49
	b. B.Sc. nursing	0	0	0		
	P-value					0.114
4	**Type of college**					
	a. Government college	0	0	0		
	b. Private college	12	14	4		
	P-value					0.469
5	**Residential status**					
	a. Residential at Ghaziabad	4	6	5	3.552	9.49
	b. Resident of nearby area	9	1	4		

S.No	Socio-demographic	Level of knowledge in post-test	Chi-square value	Chi-square table value	Df	S/NS
	c. Resident of other city	0	0	1		
	P-value					0.986
6	**Previous training in partograph usage**					
	a. Yes	2	3	6	0.965	16.92
	b. No	18	5	6		
	P-value					0.893
7	**Experience in clinical setting**					
	a. None	16	1	5	0.232	5.99
	b. Less than 6 months	1	4	3		
	c. 6 months to 1 year	0	0	4		
	d. More than 1 year	0	0	0		
	P-value					0.091
8	**Comfort level with technology**					
	a. Video based teaching	11	8	5	4.773	5.99
	b. Lecture based teaching	1	4	1		
	c. Practical demonstrations	0	0	0		
	d. Written materials	0	0	0		
	P-value					0.036
9	**Comfort level with technology (overall)**					
	a. Very comfortable	5	10	6	6.607	5.99
	b. Comfortable	2	6	4		
	c. Neutral	0	0	2		

S.No	Socio-demographic	Level of knowledge in post-test	Chi-square value	Chi-square table value	Df	S/NS
	d. Uncomfortable	0	0	0		
	e. Very uncomfortable	0	0	0		
	P-value					0.294
10	**Language proficiency**					
	a. Fluent in English	7	10	4	4.934	9.49
	b. Fluent in Hindi	5	2	1		
	c. Fluent in both English and Hindi	0	1	0		
	d. Proficient in other language	0	0	0		
	P-value					0.294

Discussion

The findings of this study align with and expand upon existing literature concerning the effectiveness of educational interventions in improving healthcare professionals' knowledge and utilization of partographs. The significant improvement in knowledge scores observed after the Video Assisted Teaching (VAT) intervention is consistent with previous research highlighting the benefits of video-assisted learning in nursing education [4]. For instance, Upadhyay et al. (2020) demonstrated a substantial increase in partograph utilization knowledge among Skilled Birth Attendants in Nepal following instructional video training, moving from a baseline of 37.8% to 76.9% [5]. Similarly, Donkin, Askew, and Stevenson (2019) found that video feedback and e-learning enhanced laboratory skills and engagement in medical laboratory science students, reinforcing the pedagogical value of visual and interactive learning modalities [4].

Our study's demographic analysis revealed that a significant majority of participants (93%) had no prior training in partograph usage, and 86% lacked clinical experience in this area. This underscores a critical gap in foundational knowledge and practical exposure, which VAT effectively addressed. The observed shift from 73% poor knowledge in the pre-test to only 26% in the post-test, coupled with an increase in good knowledge from 10% to 26%, provides strong evidence for VAT's capacity to bridge such knowledge deficits. This is particularly relevant given the challenges identified by other studies, which reported that only 55% of midwives in India had adequate partograph knowledge, with only 48% routinely utilizing it due to factors like workload and insufficient training. Our findings suggest that a well-structured VAT program can mitigate the impact of insufficient prior training.

The statistically significant association between post-test knowledge scores and gender, as well as comfort level with technology, warrants further consideration. While the study did not delve into the reasons behind these associations, they suggest potential areas for tailored educational approaches. For example, understanding why comfort with technology correlates with better learning outcomes could inform the

design of future digital learning tools. This aligns with the broader discourse on the adoption of electronic partographs, where studies by Wakgari et al. (2019) have highlighted that while adoption rates can be high, issues with completeness and consistency of documentation persist, pointing to the need for continuous education and support beyond initial training [6]. The effectiveness of VAT in improving knowledge is a crucial step towards ensuring not just adoption, but also proficient and accurate utilization of electronic partographs in clinical practice.

Conclusion

This study conclusively demonstrates that Video Assisted Teaching is an effective educational intervention for significantly improving the knowledge of GNM 3rd year nursing students regarding electronic partographs. The substantial increase in post-test knowledge scores compared to pre-test scores, supported by robust statistical analysis, indicates that VAT can successfully address existing knowledge gaps and enhance students' understanding of this critical labor management tool. The findings advocate for the integration of VAT into nursing curricula to better prepare future healthcare professionals for the complexities of modern obstetric care.

Recommendations

Based on the findings of this study, the following recommendations are put forth:

- **For Nursing Administrators:** Incorporate Video Assisted Teaching modules on electronic partographs as a standard component of the GNM curriculum. Regular workshops and in-service education programs should be organized to ensure continuous professional development and update nurses' knowledge on electronic partographs.
- **For Educators:** Develop and utilize interactive and comprehensive VAT materials that cater to diverse learning styles and address potential barriers to technology adoption. Emphasize practical application and critical thinking skills in conjunction with theoretical knowledge.
- **For Future Research:** Replicate this study with larger and more diverse samples to generalize the findings. Comparative studies could explore the effectiveness of VAT against other teaching methodologies. Further research could also investigate the long-term retention of knowledge and the impact of VAT on actual clinical practice and patient outcomes.

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