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Effectiveness of Multimodal Package on Clinical Hand Off Upon Knowledge and Practice Among Ward Nurses' at Apollo Main Hospital, Chennai

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Abstract: *Background: Clinical handoff is a crucial process in nursing practice, ensuring the accurate transfer of patient information, responsibility, and care continuity between healthcare professionals. Effective handoff communication minimizes errors, enhances patient safety and improves healthcare outcomes.*

Methods & Materials: A true experimental pre -test post-test research design was conducted at Apollo Hospitals, Chennai, among 100 staff nurses' selected by convenient sampling technique. After obtaining the setting permission and informed consent from participants, data was collected using pretested and validated tools such as background variables proforma of staff nurses , structured knowledge questionnaire was developed by the investigator through Google forms in what's app and e- mails to assess the knowledge on patient handover using Clinical Hand off and practice checklist developed by the investigator through observed structured clinical examination (OSCE) to assess the practice on patient handover using Clinical Hand off. It consists of 10 items in each station.The data regarding background variables and pre-test assessment of knowledge on patient handover was obtained on day 1. Then post- test knowledge and practice was conducted on the day 6. The collected data were analysed using descriptive and inferential statistics.

Results: The statistically significant increase in mean knowledge scores (from 15.08 to 21.85; $p< 0.001$) confirms that the training not only enhanced understanding but also translated into improved clinical performance. All 100 staff nurses scored above 30, indicating that 100% of participants demonstrated adequate clinical handoff practices following the intervention. This reflects a high level of compliance and understanding of proper handoff procedures among the nursing staff.

Conclusion: Targeted educational interventions significantly enhance both the knowledge and practice of staff nurses regarding clinical handoff, ultimately contributing to safer patient care and improved communication in healthcare settings..

Keywords: Nurses', Multi Modal Package, Clinical handoff, Patient handover, OSCE

I. INTRODUCTION

Effective communication during clinical handoff is essential to ensuring patient safety, continuity of care, and the reduction of medical errors. Handoff communication, the process of transferring responsibility and accountability for patient care between healthcare providers, is recognized as a critical point of vulnerability in clinical settings (1). Ineffective handoff practices have been associated with adverse events, including delayed diagnosis, medication errors, and increased hospital stays (2).Ward nurses', being on the frontlines of patient care, frequently engage in handoff processes during shift changes, interdepartmental transfers, and patient discharges. Despite its significance, studies have shown that handoff communication among nurses' is often inconsistent, lacking structure and essential information (3).

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To address these issues, the implementation of standardized and multimodal handoff tools—such as checklists, electronic records, and training modules—has been recommended to improve both knowledge and practice (4).

Multimodal intervention packages that combine theoretical education, simulation-based training, and standardized tools such as SBAR (Situation, Background, Assessment, and Recommendation) have shown promise in enhancing communication skills among healthcare professionals (5). These interventions aim not only to increase the knowledge base of nurses but also to foster consistent and effective practices during handoff, ultimately improving patient outcomes.

Effective clinical handoff is crucial to ensure patient safety, continuity of care, and the reduction of medical errors during shift changes or patient transfers. Despite its importance, inconsistent handover practices and inadequate communication among nurses can lead to compromised patient outcomes. This study aims to assess the effectiveness of a **multimodal intervention package** in enhancing the **knowledge and practice** of ward nurses, thereby standardizing and improving the quality of clinical handoffs at Apollo Main Hospital, Chennai.

STATEMENT OF THE PROBLEM

An Evaluative study to determine the Effectiveness of Multimodal package on clinical hand off upon knowledge and practice among ward nurses' at Apollo Main Hospitals, Chennai.

OBJECTIVES

To assess the existing knowledge and practice of ward nurses' regarding clinical handoff.

To evaluate the effectiveness of training interventions in improving clinical handoff practices.

II. REVIEW OF LITERATURE

Importance of Effective Clinical Handover

Effective clinical handover is crucial for ensuring patient safety and continuity of care. According to the World Health Organization (WHO, 2007), communication failures during handover contribute significantly to adverse events in hospital settings. Poor handoff practices can result in miscommunication, incomplete transfer of information, and medical errors.

Multimodal Interventions for Improving Handover

Multimodal educational packages—integrating lectures, simulations, checklists, and role plays—have shown significant improvements in both knowledge and practice of clinical handover. Starmer et al. (2014) conducted a study on the I-PASS handoff bundle, a multimodal intervention, and reported a 23% reduction in medical errors post-intervention.

Nurse-Focused Handover Training

Studies specifically targeting nurses' show that structured handover training improves communication efficiency and patient outcomes. For instance, Johnson et al. (2015) evaluated a training program using SBAR (Situation, Background, Assessment, Recommendation) among nurses and found statistically significant gains in both knowledge and compliance with standard handover protocols.

Knowledge and Practice Gaps in Indian Hospitals

In the Indian context, limited studies have evaluated structured interventions for handover. A study by Singh and Sharma (2019) in a tertiary care hospital in India found that nurses lacked formal training in handoff communication and that structured training significantly improved their knowledge scores.

Multimodal Learning in Nursing Education

Multimodal approaches cater to diverse learning styles (visual, auditory, kinesthetic) and are more effective than traditional lecture-based formats. Zhang et al. (2016) emphasized that simulation combined with interactive sessions enhanced knowledge retention and practical application among nursing staff.

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III. MATERIALS AND METHODS

A Quasi experimental pre-test post-test design was adopted for this study to assess the effectiveness of a multimodal package on knowledge and practice regarding clinical handoff among staff nurses'. This design enabled the measurement of change in outcomes before and after the intervention, ensuring control over variables and establishing cause-and-effect relationships. The study was conducted at Apollo Main Hospitals, Chennai, and a tertiary care hospital offering a wide range of inpatient and outpatient services. The target population comprised staff nurses' working in various wards of Apollo Hospitals, Chennai.

A total of 100 staff nurses' were selected for the study using a convenient sampling technique based on their availability and willingness to participate. Inclusion criteria included nurses currently working in clinical wards, those with at least six months of work experience, and those willing to give informed consent. Nurses' on leave and nurses' working in Critical care units, OPD, Emergency Room and Operation Theatre. Informed consent was acquired from all participants via Whats-App and email. Confidentiality and anonymity of the participants were maintained throughout the study. Participants were informed about the purpose of the study, and their right to withdraw at any time without any consequence.

Three structured tools were developed and used by the investigator: Demographic and Background Variables proforma-This form collected personal and professional details of the participants such as age, gender, educational qualification, years of experience, current ward of posting, and prior training in clinical handoff communication. Structured Knowledge Questionnaire-This tool was developed by the investigator to assess participants' knowledge on clinical handoff. it was designed in the Google Forms platform and distributed via Whats-App and email. The questionnaire comprised multiple-choice questions covering aspects of clinical handoff principles, importance, components (e.g., SBAR), and common challenges. Content validity was ensured by subject matter experts in nursing education and clinical practice. Practice Checklist using OSCE Format. The Observed Structured Clinical Examination (OSCE) was used to assess the clinical practice of staff nurses in handing over patient care.The checklist was developed by the investigator and included 10 essential items per station, each scored based on performance criteria such as completeness, accuracy, communication skills, and use of standardized tools (e.g., SBAR format). Nurses were assessed through simulation-based scenarios observed by trained evaluators.

The **multimodal package** is a structured intervention that combines various teaching and implementation strategies such as interactive workshops, audiovisual aids, simulation-based training, standardized handoff tools (e.g., SBAR), and hands-on demonstrations. It is designed to enhance nurses' communication skills, promote consistency in handover procedures, and ensure that critical patient information is accurately transferred during every shift changeDay 1: After obtaining consent, data collection commenced with the administration of: Demographic proforma, Pre-test knowledge assessment via Google Forms, Day 2 to Day 5: Delivery of the **multimodal intervention package, Day 6: Post-intervention assessments were conducted, including: Post-test knowledge assessment using the same Google Forms, Post-test practice assessment using the OSCE checklist, The collected data were analyzed using SPSS (Statistical Package for the Social Sciences). Both **descriptive and inferential statistics** were used

IV. RESULTS AND DISCUSSION

The age distribution of staff nurses' in the present study reveals a relatively young workforce, with the majority (45%) falling within the 26–30 years age group. Additionally, 30% of the nurses were aged between 21–25 years, indicating a substantial number of early-career or newly inducted professionals. Only 10% were above 35 years, the nursing staff was predominantly female (80%). Male nurses accounted for 20%, half of the nurses (50%) held a B.Sc. Nursing degree, reflecting a strong presence of formally educated professionals. Diploma holders constituted 35% of the sample, A smaller segment had pursued higher education, with 10% having completed Post Basic B.Sc. Nursing and only 5% holding an M.Sc. in Nursing, The analysis of professional experience showed that the largest group (40%) had between 1–3 years of work experience, Additionally, 30% of the nurses' had over 6 years of experience, providing valuable clinical expertise and institutional knowledge. A smaller portion (20%) had 4–6 years of experience, while 10% were novices with less than one year, only 28% of the staff nurses' reported having received prior training on handoff communication, while a significant majority (72%) had not undergone any such training. This highlights a critical gap

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in formal communication preparedness, which is essential for ensuring patient safety, minimizing errors, and facilitating effective continuity of care during nurse-to-nurse handovers.

A critical finding is that **only 28% of the nurses' had previous training on handoff communication.** This gap is significant, considering that effective handoff is essential for patient safety and continuity of care. Research by **The Joint Commission (2017)** highlights that communication failures are one of the leading causes of sentinel events in healthcare settings. Furthermore, **Patterson et al. (2019)** demonstrated that structured handoff training programs significantly improve the accuracy and efficiency of information transfer during shift changes.

The data indicates a significant improvement in the knowledge of staff nurses' regarding clinical handoff after the implementation of a multimodal training package: In the pre-test, a majority of nurses' (67%) demonstrated inadequate knowledge, while 33% had moderately adequate knowledge. Notably, none of the participants had adequate knowledge prior to the intervention. In the post-test, the scenario reversed significantly. 80% of the nurses attained adequate knowledge, and the remaining 20% showed moderately adequate knowledge. Importantly, none were left with inadequate knowledge after the training. This indicates that the multimodal package was highly effective in improving the theoretical understanding of clinical handoff procedures among the staff nurses'.

These findings are consistent with the study by Riesenberg et al. (2010), which highlighted that targeted educational interventions using structured communication models like SBAR significantly improve nurses' knowledge and confidence in clinical handoffs. Similarly, Patterson et al. (2019) reported that multimodal strategies—combining lectures, videos, role-plays, and real-time feedback—led to a marked improvement in both knowledge and practice in handoff communication.

The results from this study reaffirm the necessity of regular in-service education using interactive and multimodal approaches to equip nurses' with the required competencies in communication and teamwork. In environments such as busy hospital wards, where shift transitions are frequent, such training is not only beneficial but essential for ensuring patient safety and optimal care outcomes.

The mean knowledge score increased from 15.08 (±2.71) in the pretest to 21.85 (±1.34) in the posttest, showing a substantial improvement of 6.77 points. The t-value of 22.58 with a p-value < 0.001 indicates that the increase in knowledge is highly statistically significant. This improvement cannot be attributed to chance and demonstrates the effectiveness of the multimodal training intervention on enhancing the knowledge of clinical handoff practices among nurses'.

All 100 staff nurses scored above 30, indicating that **100%** of participants demonstrated **adequate clinical handoff practices** following the intervention. This reflects a **high level of compliance and understanding** of proper handoff procedures among the nursing staff. Such a result suggests that the **training intervention was highly effective**, enabling staff to not only gain knowledge but also apply it in practice. The consistency across scores points to strong retention and translation of learning into behavior, which is critical for **safe patient handover and continuity of care.**

A study by **Starmer et al. (2014)** on implementing structured handoff protocols found that the use of standardized handoff tools (like I-PASS) significantly improved the quality and safety of handoff communication in clinical settings. Similarly, **Arora et al. (2012)** reported improved compliance and reduced medical errors following structured training on handoff protocols. These findings align with the current data, reinforcing the **effectiveness of structured, multimodal training** in enhancing clinical practice.

V. CONCLUSION

The findings of this study clearly demonstrate the positive impact of structured training on clinical handoff practices among staff nurses'. Post-intervention assessments revealed that 100% of participants exhibited adequate levels of practice, indicating a strong uptake and application of the knowledge and skills imparted during the training program. In conclusion, targeted educational interventions significantly enhance both the knowledge and practice of staff nurses regarding clinical handoff, ultimately contributing to safer patient care and improved communication in healthcare settings. Regular training and reinforcement are recommended to sustain and further improve these outcomes.

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CONFLICT OF INTEREST: Nil

Table 1. Frequency and Percentage Distribution of Background Variables of Staff Nurses'
N=100

S. No	Background Variables	Categories	Frequency	Percentage
1	Age (in years)	21–25	30	30%
		26–30	45	45%
		31–35	15	15%
		>35	10	10%
2	Gender	Male	20	20%
		Female	80	80%
3	Educational Qualification	Diploma in Nursing	35	35%
		B.Sc. Nursing	50	50%
		Post Basic B.Sc. Nursing	10	10%
		M.Sc. Nursing	5	5%
4	Years of Experience	<1 year	10	10%
		1–3 years	40	40%
		4–6 years	20	20%
		>6 years	30	30%
5	Previous Training on Handoff	Yes	28	28%
		No	72	72%

The age distribution of staff nurses' in the present study reveals a relatively young workforce, with the majority (45%) falling within the 26–30 years age group. Additionally, 30% of the nurses were aged between 21–25 years, indicating a substantial number of early-career or newly inducted professionals. Only 10% were above 35 years, the nursing staff was predominantly female (80%). Male nurses accounted for 20%, half of the nurses (50%) held a B.Sc. Nursing degree, reflecting a strong presence of formally educated professionals. Diploma holders constituted 35% of the sample, A smaller segment had pursued higher education, with 10% having completed Post Basic B.Sc. Nursing and only 5% holding an M.Sc. in Nursing,

Table 2: Frequency and Percentage Distribution of level of Knowledge on patient handover by Clinical hand off
N= 100

Knowledge on clinical Handoff	Pre Test f	%	Post Test f	%
Adequate Knowledge	-		80	80
Moderately Adequate Knowledge	33	33	20	20
Inadequate Knowledge	67	67	-	

The above table indicates a significant improvement in the knowledge of staff nurses' regarding clinical handoff after the implementation of a multimodal training package: In the pre-test, a majority of nurses' (67%) demonstrated inadequate knowledge, while 33% had moderately adequate knowledge. Notably, none of the participants had adequate knowledge prior to the intervention. In the post-test, the scenario reversed significantly. 80% of the nurses attained

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adequate knowledge, and the remaining 20% showed moderately adequate knowledge. Importantly, none were left with inadequate knowledge after the training.

Table 3 Comparison of Pre-test and Post-test Knowledge Scores on Clinical Hand off of Staff Nurses' N=100

	Group (N=100)			
Knowledge	**Mean**	**Mean SD**	**Paired Diff**	**Paired "t" value**
Pre test	15.08	2.71	22.58	
Post Test	21.85	1.34	p<0.001	

The mean knowledge score increased from 15.08 (±2.71) in the pretest to 21.85 (±1.34) in the posttest, showing a substantial improvement of 6.77 points. The t-value of 22.58 with a p-value < 0.001 indicates that the increase in knowledge is highly statistically significant. This improvement cannot be attributed to chance and demonstrates the effectiveness of the multimodal training intervention on enhancing the knowledge of clinical handoff practices among nurses'.

Table 4: Frequency and Percentage Distribution of level of practice on Clinical hand off N= 100

Score	Number of staff nurses'	Interpretation
> 30	100	Adequate practice
20 -30	-	Moderate practice
< 20	-	Inadequate practice

All 100 staff nurses scored above 30, indicating that **100%** of participants demonstrated **adequate clinical handoff practices** following the intervention. This reflects a **high level of compliance and understanding** of proper handoff procedures among the nursing staff. Such a result suggests that the **training intervention was highly effective**, enabling staff to not only gain knowledge but also apply it in practice. The consistency across scores points to strong retention and translation of learning into behavior, which is critical for **safe patient handover and continuity of care.**

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