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RESEARCH ARTICLE

"STUDY OF HANDOVER PRACTICES AMONG NURSING STAFF OF A TERTIARY CARE TEACHINGHOSPITAL IN NORTH INDIA"

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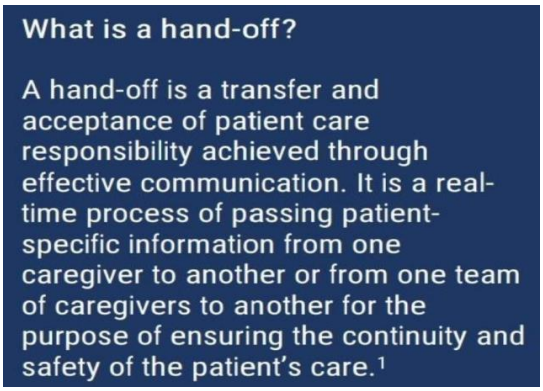
Abstract

The study aimed to implement a standardized guiding nursing handover protocol and assess its impact on handoff practices. A total of 282 handover observations were analyzed before and after the intervention, and various factors related to handoffs were examined, including time specificity, place of handoffs, methods used, patient involvement, and nursing staff satisfaction. The study found that less experienced nurses faced challenges with handoffs, and the majority of handoffs occurred during evening and night shifts. Patient involvement during handovers was minimal, particularly in emergency and ward settings. The study also revealed the need for training and guidance on handoffs, as many nurses had not received adequate instruction in this area. Following the intervention, improvements were observed in terms of timing precision, duration of handovers, inclusion of bedside handoffs, and satisfaction with the information received during handovers. The study highlights the importance of effective handover practices in ensuring patient safety and suggests the implementation of training programs and standardized guidelines for handoffs.

Introduction:-



Poor communication and handover are responsible for the majority of serious adverse events in healthcare[1,2] and are the most common causes of preventable medical errors. Some authors have also recommended the use of checklists to standardize patient transfer, and these have improved the quantity and quality of information transmitted.[3,4,5] Handoffs are given using various methods: verbally[3], with handwritten notes[4], at the bedside[5,6] by telephone[7], by

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audiotape[5], nonverbally[8], using electronic reports[9], etc. In 2007, the Joint Commission International (JCI) and the World Health Organization suggested implementation of a standardized approach to handover communication.[10] Effective communication is one of the JCI's main patient safety goals and one of the elements assessed during hospital accreditation. Handover needs to fulfil the criteria of being timely, accurate, complete, unambiguous, and understood by the recipient.[11]

A study of five emergency departments (EDs) revealed that there were differences in the characteristics of handoffs among the EDs studied, but "nearly universal" attributes of handoffs were also noted[12]. The handoff of the ED setting is viewed as a rich source for adverse events[13].

Methods:-

Study design

This prospective, pre-/post-implementation study of one-year duration, effective from 01-01-21, was conducted at a tertiary care hospital in North India in the ward block area (General Medicine and General Surgery), Emergency area (Medical Emergency, Surgical Emergency, and Observation wards), and ICUs (Medical and Surgical ICU) using a standardized guiding nursing handover protocol. Handoff practices in these areas were observed using a structured observational checklist formulated from various nursing guides/manuals provided by (AMA)80, (ACSQHS)81, and recommendations from various publications.

A total of 282 handover observations including file records before intervention and 282 after intervention were analyzed using simple random sampling during shift changes (94 observations in each area). Determination of the sample size was conducted using GPOWER software (Version 3.0.10). It was estimated that the least number of handovers of shift changes required with 80% power, 5% significance level, and an effect size of 0.165 is 282. Therefore, a total of 282 shift changes (before and after) were included in the study. Additionally, a total of 70 nursing staff were included in the study, comprising the total number of staff in these three areas. The practice in these areas was studied for one and a half months each (totaling 4 and a half months in all areas).

Measures: -

1. Participants 'sociodemographic characteristics
2. Handoff-related characteristics

Demographic profile/general characteristics of the participants (experience/time in service, shift time, age, sex, education qualification, area of work), **handoff-related characteristics** (time, place, method, patient involvement, knowledge, perception, satisfaction, constraints in doing proper handover, training regarding handoffs).

The information about patient reports were also analyzed and recorded to study type and frequency of information exchange during nursing handovers**.**

Later intervention was carried out for 3 months during which staff in these areas were educated regarding handoffs with the help of lecture cum discussion and a self-instructional module. During intervention staff was provided a guide/templet highlighting the importance on various aspects of handoffs. The verbal reports were augmented with pre-printed, patient specific forms regarding data that could be easily transferred. We combined these findings with published effective tools into a checklist to standardize the way of doing things. The checklist was designed by compiling items from different handover checklists based on previous studies.

Handoff practice towards the implemented protocol was assessed in the post interventional period of 1 and half month in each area (4 and half month total) using the same checklist.

Statistical Methods: -

The recorded data was compiled and entered in a spreadsheet (Microsoft Excel) and then exported to data editor of SPSS Version 20.0. The categorical variables were summarized as frequencies and percentages. Chi-square test was applied for inter group comparison of categorical variables, and for pre-post comparison of categorical variable, chi square McNemar test was employed. A P-value of less than 0.05 was considered statistically significant.

Results:-

Frequency and percentage of staff nurses according to socio-demographic data

Figure 1:- Age distribution of respondents.

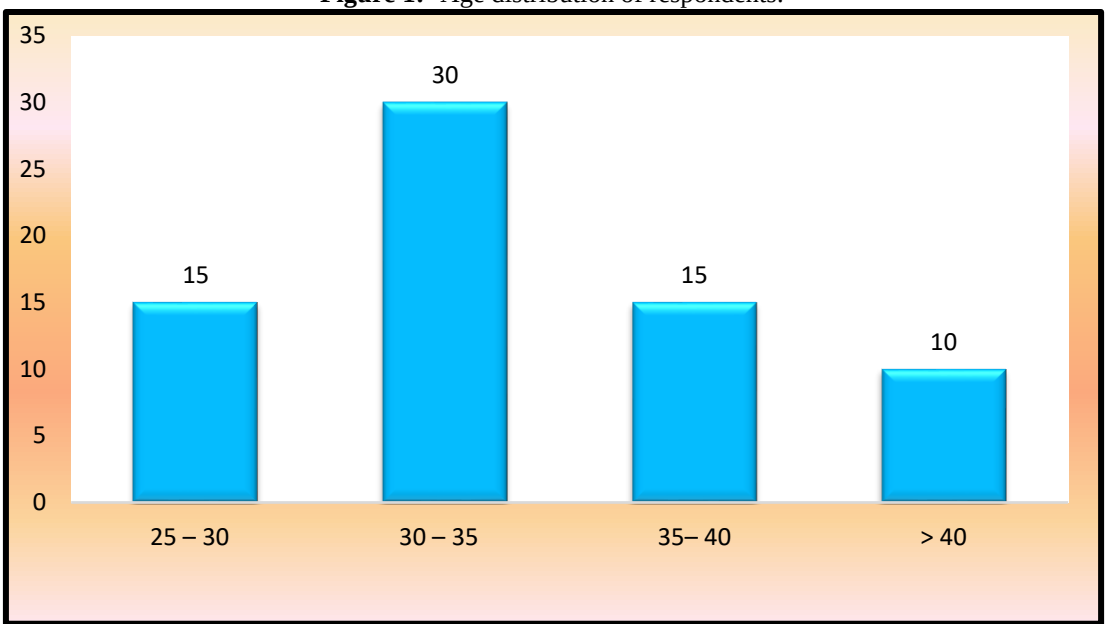


Figure 2:- Gender distribution (N = 70)

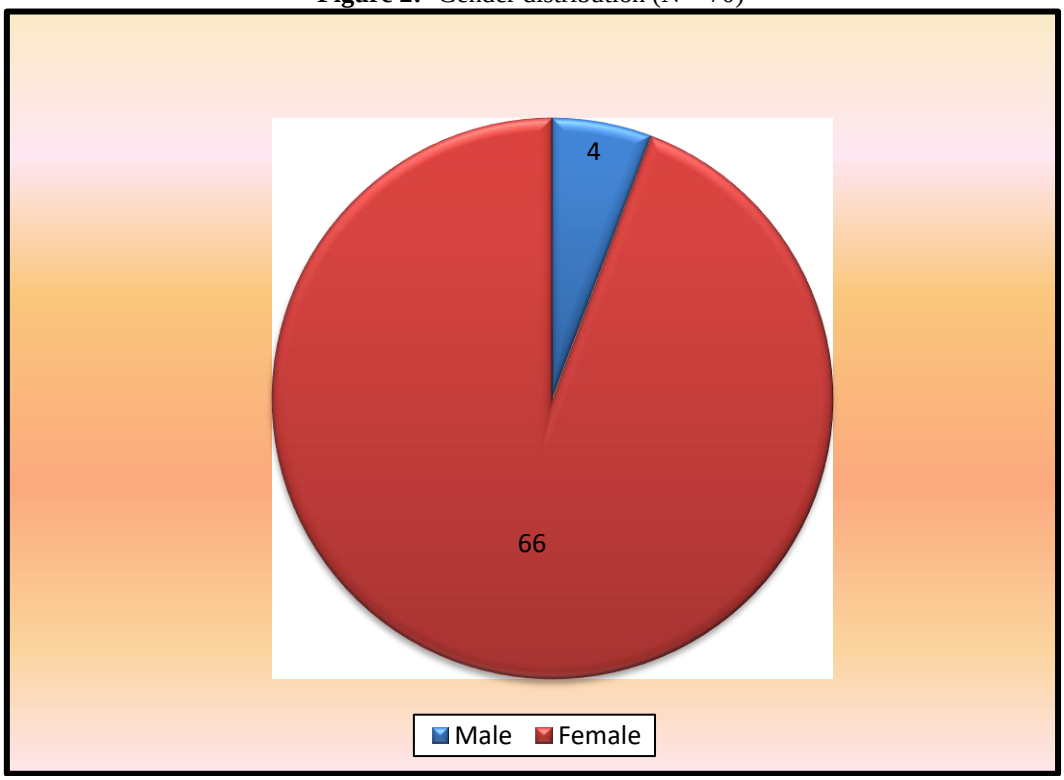


Figure 3: - Educational qualification of staff(N=70).

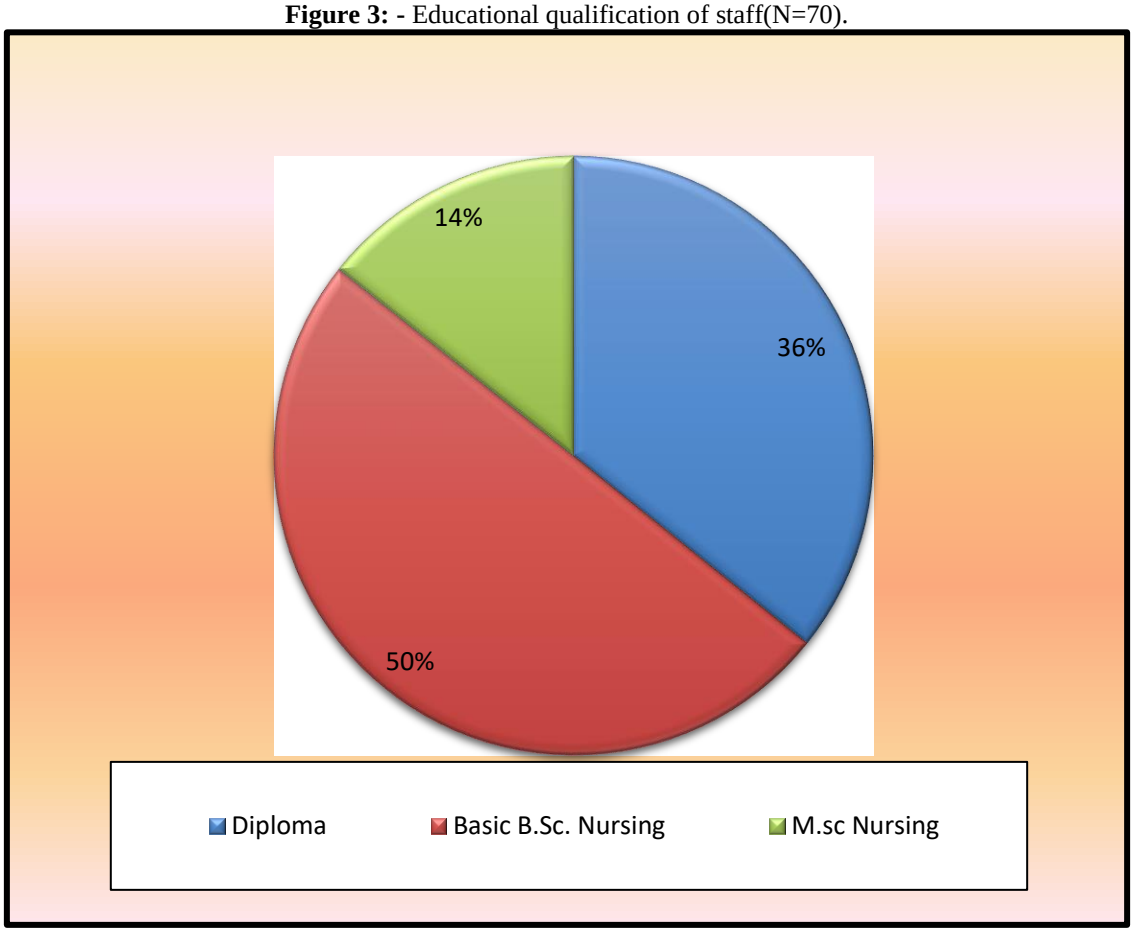


Figure 4:- Area of work distribution of staff(N=70).

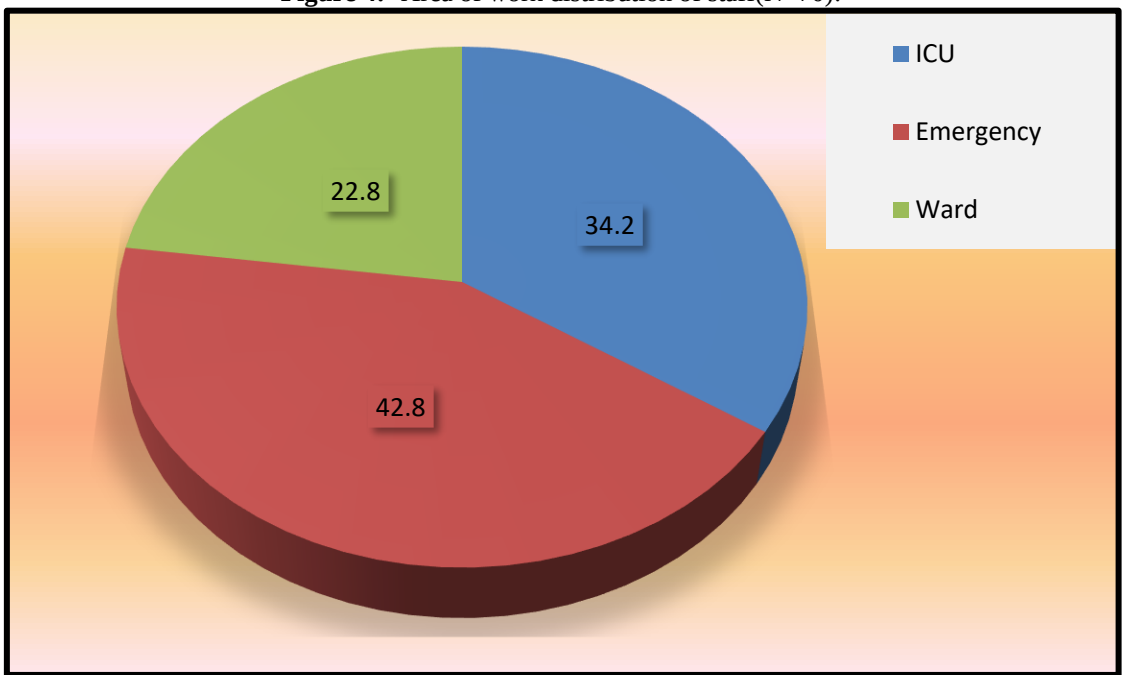
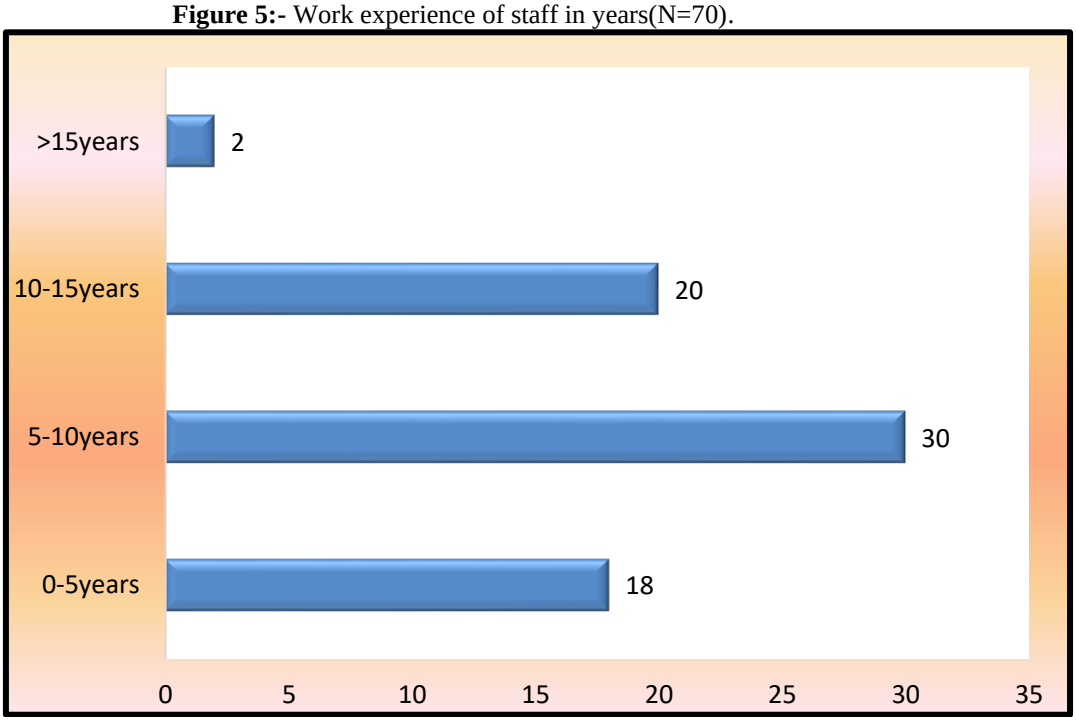


Figure 5:- Work experience of staff in years(N=70).



As for experience, we found the majority of the staff (42.8%) possessed 5 to fewer than 10 years of experience. Among a total staff of 70, the demographic distribution was delineated as follows:15 personnel aged between 25-30 years,30 individuals within the 30-35 years age bracket, 15 employees aged 35-40 years, and 10 staff members exceeding 40 years of age. Based on educational qualification (N=70),10(14.3%) was MSC ,35 were BSC and 25 were Diplomas being bachelors, Percentage of less experienced nurses was more compared to experienced nurses.

Handoff Related Characteristics

Table 1:- Time specificity of handoffs shift-wise.

Category	**Preintervention**		**Postintervention**		**P value**
Time specificity	**Frequency**	**%age**	**Frequency**	**%age**	
Morning shift(N=94)	37	39.36	49	52.12	
Evening shift(N=94)	67	71.27	79	84.04	
Night shift(N=94)	69	73.4	81	86.17	**0.04***
Chi-square-McNemar'stest					

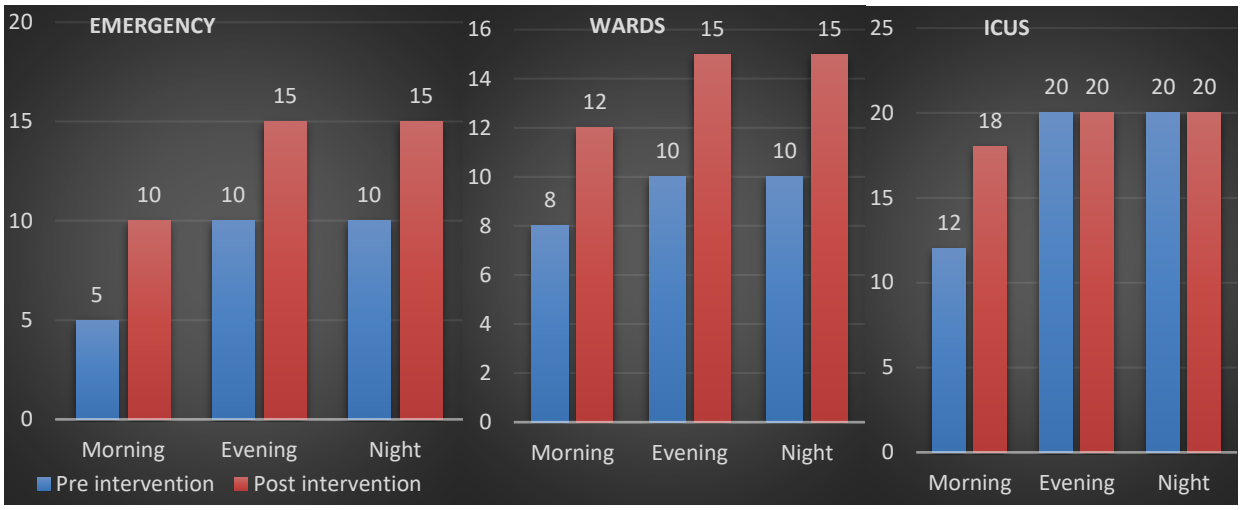


Fig 6,7,8:- Time duration of handoffs in emergency, wards and ICUS shift wise.

Time parameters-

Observations analyzed among shift changes revealed that(71.27%) handovers in evening shift and (73.40%) handoffs at night shift occurred at a specific time as compared to morning shifts(39.36%). Morning handovers lasted for < 10 minutes. Comparing areas, handoffs in emergency area were of less duration compared to other areas, duration seen highest in ICUS (20minutes). Post intervention time specificity of handovers among staff also improved and a statically significant value of<**0.05**was obtained (table 1), duration of handovers also increased (fig 6,7,8)

Table 2:- Place of handoffs.

Location	Pre-intervention N=282		Post-intervention N=282		
	Frequency(n)	**Percentage (%)**	**Frequency(n)**	**Percentage (%)**	**P value+**
Emergency	**N=94**				
Bedside	3	3.2	11	11.71	
Nursing Station	84	89.36	84	89.36	
Corridor	0	0	0	0	0.7675
Room/ward	10	10.64	10	10.64	
Chi-squareMcNemar'stest					
Ward	**N=94**				
Bedside	10	10.64	27	28.73	
Nursing station	86	91.48	94	100	
Corridor	0	0	0	0	**0.03***
Room/ward	8	8.51	0	0	
Chi-squareMcNemar'stest					
ICUs	**N=94**				
Bedside	94	100	94	100	
Nursing Station	94	100	94	100	
Corridor	00	00	00	00	1.0
Room/ward	00	00	00	00	
Chi-squareMcNemar'stest					

Handoff Practice was carried out mainly in nursing station in wards 86(91.48%), emergency and observation ward 84(89.36%) in a face-to-face manner and bed-side handoffs were neglected inwards and emergency,

transfer of communication in ICU happened both in nursing station (100%) and at bedside (100%). Post intervention improvement in Handovers was seen, including bed-side handoffs (28.73%) with statistically significant(p-value=<0.05)

Table 3:- Methods of handovers pre and post intervention.

Method	Preintervention(N=282)		Post intervention(N=282)		P value+
	n	%	N	%	
OnlyVerbal	69	24.46	30	10.64	
OnlyinWritten	10	3.55%	3	1.06	
Both written and verbal	203	71.73	249	88.30	
Recording	00	00	00	00	
Viatelephone	00	00	00	00	<0.0001*
Chi-squareMcNemar's test					

Table 3 reveals 71.73% involved both verbal and written communication, while 24.46% were solely verbal and only 3.55% relied purely on written reports without a standardized format. While emphasizing the significance of both face-to-face verbal updates and structured written reports and on enhancement of verbal reports with patient-specific forms improvements were evident with 88.30% instances utilizing both verbal and written reports, showing statistical significance (p-value <0.05).

Notably, improvements were observed in both verbal and written reports after the intervention.

Table4: - Patient involvement during handoffs pre and post intervention.

	Total282	Pre-intervention		Post-intervention		P-value
		Frequency	%age	Frequency	%age	
Emergency	94	3	3.20	10	10.64	
Wards	94	14	10.64	26	27.66	
ICU	94	94	100	94	100	0.102
Chi-SquareMcNemartest						

Patient involvement during nursing handovers was minimal—only 3.20% in emergencies and 10.64% in wards—showing exclusion of patients in these contexts. In ICU settings, involving patients (through bedside handovers and discussions with family members) was seen.

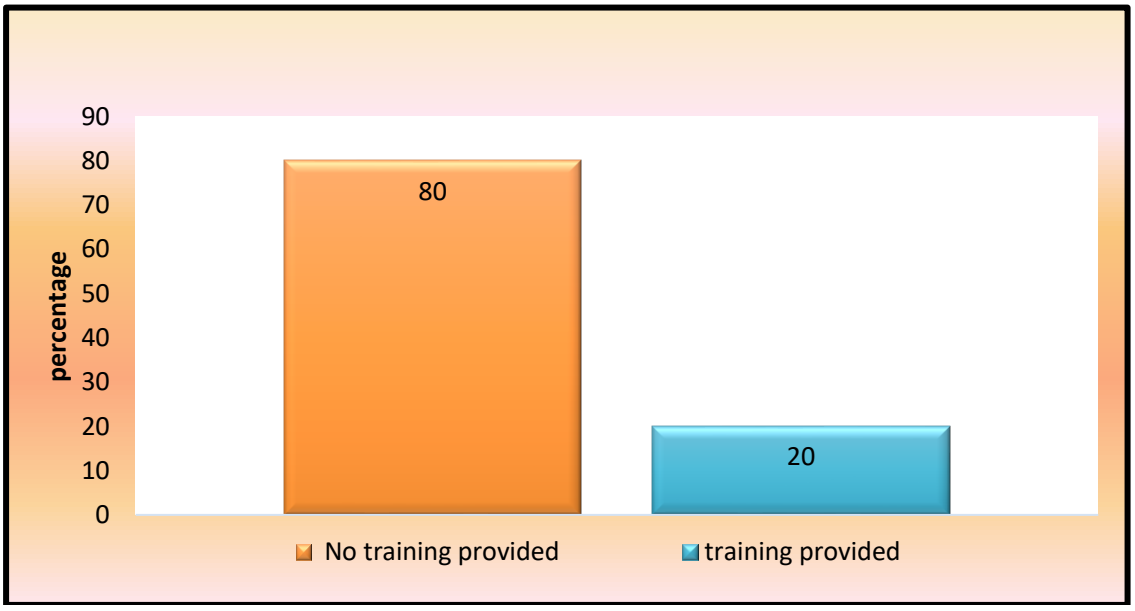


Fig-9:- Training for handoffs.

Table5:- Nurse's satisfaction regarding handoffs.

	Pre-intervention		Post-intervention		
	n	%	n	%	P value
Satisfied with current method	25	35.71	35	50	0.006*
Unsatisfied with current method	45	64.29	35	50	

Out of the respondents, 80% staff indicated they hadn't received any training or guidance on handovers. Conversely, 20% mentioned having received prior training, mostly from senior nurses through verbal instructions and observations. They highlighted the absence of standard guidelines or checklists for hospital handoffs. 35.71% staff expressed satisfaction with the existing handoff practices, while 64.29% were dissatisfied. Following the intervention, satisfaction with the information received during handovers rose significantly from 35.7% to 50% (p-value < 0.05),(table 5,fig 9)

Discussion:-

As for experience, we found the majority of the staff (42.8%) possessed 5 to fewer than 10 years of experience. This indicates that less experienced professionals may have acquired handoff skills primarily through verbal instruction and observation from senior nurses, lacking formal training or guidance in this aspect. Consequently, these nurses might have faced challenges with handoffs. This observation aligns with another study's findings, showing a prevalence of professionals with 1-10 years of experience (65%).Regarding this aspect, he highlighted that experienced professional, with more than ten years, had in-depth knowledge in nursing clinic and had a broad vision, perspicacity, speed of action, and define priorities with greater competence[14].Another study in 2015 found that beginners, in general, have difficulties in applying theoretical knowledge in communication and management practice[15]. Another seven-year prospective study found that nurse workload and inexperienced medical staff members are associated with seasonal peaks in severe adverse events in the adult medical intensive care unit (638 severe adverse events involving 498 patients were recorded but seasonal peaks could not be explained by proportion of inexperienced nurses and doctors. In this context another study found that less experienced staff nurses encounter issues with handoffs and may need supplemental information during the handoff[16]. It is recommended that we should provide continuing education programs on effective handoff strategies, Support novice nurses with orientation and preceptor programs[16].Nevertheless, there is a significant relationship between nurses' CB and their experience and workload for all caring dimensions as reported by Shalaby et al.[17]

Among a total staff of 70, the demographic distribution was delineated as follows:15 personnel aged between 25-30 years,30 individuals within the 30-35 years age bracket, 15 employees aged 35-40 years, and 10 staff members exceeding 40 years of age. Based on educational qualification (N=70),10(14.3%) was MSC ,35 were BSC and 25 were Diplomas being bachelors, Percentage of less experienced nurses was more compared to experienced nurses. Researches indicate improved nursing service performance often correlates with advancing age (above 40 years), increased work experience (11-15 years and 16-20 years), attainment of a bachelor's, master's, or higher degree, and holding a senior title within the nursing profession, Zhang et al.[18]

Other study showed that Individuals aged 20-29 years exhibited decreased Care behavior in public hospitals. As the age range shifted to 40-49 years, there was an observed elevation in CB levels, the level of CB was found to increase when reaching the age of 40-49.[19]

In our research, observations conducted during 282 shift changes indicated that handoffs that occurred at specific times were 71.27% in the evening and 73.40% at night, whereas only 39.36% occurred timely during morning shifts. Morning handovers consistently lasted less than 10 minutes across all three areas, contrasting with evening and night shifts where handovers typically lasted more than 10 minutes in all areas prior to any interventions. Notably, handovers in the emergency area were briefer compared to other sections, while the longest duration was observed in ICUs before any interventions were made. A separate study emphasized the importance of ensuring sufficient time for handovers to transmit essential patient information, without prolonging the duration excessively, thereby avoiding prolonged absence from patients[20]. Studies indicate the importance of duration and time

specificality for handovers. Yet, significant deficiencies were found, especially during the morning shifts. Comparing our findings with a study where 23 handovers were observed time of the day in one general medical ward. Handovers frequency was 3 times/24 h (07:00 am, 14:30 pm, 22:45 pm). At 07:00 am there were observed seven handovers, with a mean length of 18 min and their range between 15 and 22 min. However, the other handovers (afternoon and night) had more mean length (39 and 33 min respectively) [21.] The low morning compliance probably reflects the delay in arrival of the morning shift oncoming practitioner, busy morning duty corresponding with doctors' rounds, and nurse fatigue factor due to night duty[21.]Following our intervention, our analysis revealed notable improvements in the timing precision of handovers. Specifically, there was an increase from 37% to 49% during morning shifts, 67% to 79% during evening shifts, and 69% to 81% during night shifts, demonstrating statistically significant improvements **(p-value of 0.04, Chi-square-McNemar's test).** Additionally, we observed enhancements in the duration of handovers across all three areas compared to the pre-intervention period.

An important aspect of nursing handovers is patient-centered care. Our study showed that patient participation in handovers was low, the patients' and families' participation was ignored in wards (14.90%) and emergency (3.20%),while the findings of a study conducted in 2011,which examined patient perspective of nursing handover in Queensland hospitals, showed that patients valued having access to information and considered themselves an important part in maintaining accuracy that improves safety and quality[22] .A research study done in 2011 that compared patient-centered handover with transfer at the nursing station in an oncology center with regard to patient satisfaction, subtle differences were found in patient satisfaction in relation to the two handover models, with handover with the patient's participation being more satisfactory[23].Nowadays, patients desire to move from a parent model of care to a collaborative model of care, especially in pediatric wards that focus on family-cantered, also there were concerns about the time and confidentiality associated with patient involvement[24]. However, it is seen as possible and beneficial to involve patients in handover[24,25] and is a further step towards patient-centred care[26].However, percentage of patient and attendant involvement increased during post -interventional period (from14.90% to 27.66% in wards).

In our study, we found that most nursing staff in the emergency and ward areas predominantly conducted handoffs at the nursing station, with approximately 89.36% in the Emergency and 91.41% in the wards being face-to-face interactions. A smaller proportion, around 3.2% in the Emergency and 10.64% in the wards, occurred bedside. Conversely, in ICU settings, handover processes took place both at the nursing station and bedside, with 100% occurring in both locations. While bedside handovers are crucial, prior research has also acknowledged the nursing station as a suitable site for handovers. However, it's important to approach any shift from office-based to bedside handover practices with caution, as highlighted by several researchers. A study also explored the effectiveness of an intervention in order to facilitate nursing handover at the bedside and reinforce patient safety in geriatric and rehabilitation wards, the results showed better practices regarding bedside handover, increased patient satisfaction, and reduced number and severity of adverse events[27]. A similar finding showed that the optimal method of successful handover is through face-to-face verbal contact and the use of a uniform handover format[28].A study conducted in 2017 on Nursing handovers: an integrative review of the different models and processes and explored different handover models and processes and their efficacy in improving handover communication within nursing practice. They categorized handover that occurs at the nursing station as the verbal handover model, so that professionals share information about patients verbally in another location in the sector that is not at the bedside which is usually occurs at the nursing station without the professionals being able to have a good view of the patients they are talking about[29], in addition to the possibility of interruptions during their performance. On the other hand, the bedside handover model is the most complete and with the possibility of reducing communication-related failures. This model promotes patient involvement, thus being able to generate more patient safety and satisfaction[29].Bedside handover has been known to facilitate a partnership model in medication communication bring nursing team together, promoting medication review, providing a patient cantered dimension of handovers, with an additional advantage of patients providing key essential information, and an opportunity to participate actively in the process of their treatment. In our study, after intervention and guiding about the importance of bedside handovers, it was observed in our study that there was some improvement in handovers in the bed side in wards also; handovers now included bed-side handoffs along with nursing station (from 3.2%-11.71% ,10.64%-28.73% in Emergency & wards respectively)

In our analysis of 282 handoff instances, it was found that the predominant method of communication during handovers involved a combination of verbal and written exchanges, accounting for 71.73% (203 cases). Additionally, a portion of handoffs—24.46% (69 cases)—exclusively relied on verbal communication without

accompanying written reports. A smaller fraction, approximately 3.55% (10 cases), exclusively utilized written communication. Notably, these written reports lacked a standardized tool or template and were conducted using self-maintained registers. Several studies highlight the role in this context that making hand-offs solely paper communications or electronic should be avoided. An Evidence based review done in 2015 found Communication as the key element in any successful patient hand-off and successful communication includes the following key components: (1) active listening, (2) thorough documentation, and (3) detailed verbal communication between involved care providers and recommended that if face-to-face communication is not possible, one can communicate in real time via telephone[30,31]. Many studies done highlight that critical content to be communicated should be standardized by the sender during a handoff – both verbally (preferably face to face) and in written form, standardize tools and methods (forms, templates, checklists, protocols, mnemonics, etc.) to communicate to receivers.[1,32,33,34-39].In our study, during intervention the staff was educated regarding importance of face to face/verbal and written reports, the verbal reports were augmented with pre-printed, patient specific forms regarding data that could be transferred to the oncoming shift to decrease loss of information, and later our handoff methods post intervention were seen improved such as making hand-offs solely paper and solely verbal communications were reduced from (3.55% to 1.06%) and (24.46% to 10.64%) respectively. The integration of both written and verbal communication methods in handoffs surged from 71.73% before the intervention to 88.30% post-intervention, displaying a statistically significant change with a p-value below 0.05 using chi square-MCNemar test. Another study done, found that the optimal method of successful handover is through face-to-face verbal contact and the use of a uniform handover format[28].

Conclusion: -

Handoffs occur through various means such as verbal communication, handwritten notes, bedside exchanges, telephone calls, audiotapes, electronic reports, and computer printouts. They are crucial for nurse communication but can pose risks due to incomplete records and omitted information, leading to delays and breakdowns in communication. Improving staff communication is vital for patient safety. Bedside handovers, involving patients, when possible, are valued for their informative and inclusive nature. Teams should agree on handover models and tailor them to suit their needs, considering the physical environment and providing training for effective execution. Patient education on the purpose and timing of handovers is essential for promoting patient-centred care. Overall, handovers should be standardized, structured, and documented to enhance efficiency and safety in healthcare settings.

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