ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

DEPARTMENT OF INTERNAL MEDICINE

Research Title

Knowledge, Attitude and Practice of Residents towards Patient Handover during Transitions of Care of Admitted Patients in Tikur Anbessa Specialized Hospital

Principal Investigator: Eyosias Lemma Teshome, MD, (3rd year Internal Medicine resident)

Advisor: Aschalew Worku, MD (Consultant Internist, Pulmonary and Critical Care Medicine)

A Cross Sectional Study submitted to Addis Ababa University, College of Health Sciences, School of Medicine, Department of Internal Medicine in preparation for partial fulfillment of the requirement for a Specialty certificate in Internal Medicine

Addis Ababa, Ethiopia,

December 8, 2021 2021 G.C

ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

DEPARTMENT OF INTERNAL MEDICINE

Knowledge, Attitude and Practice of Residents towards Patient Handover during Transitions of Care of Admitted Patients in Tikur Anbessa Specialized Hospital

Principal Investigator: Eyosias Lemma Teshome, MD, (3rd year Internal Medicine resident)

Advisor: Aschalew Worku, MD (Consultant Internist, Pulmonary and Critical Care Medicine)

A Cross Sectional Study submitted to Addis Ababa University, College of Health Sciences, School of Medicine, Department of Internal Medicine in preparation for partial fulfillment of the requirement for a Specialty certificate in Internal Medicine

Addis Ababa, Ethiopia,

December 8, 2021 G.C

Acknowledgement

I would like to acknowledge my advisor, Dr. Aschalew Worku for his unreserved support in the development of the proposal and during the write up of the final paper. I would also like to thank Addis Ababa University and the department of Internal Medicine for providing the opportunity and the grant to run this project. Finally I would like to thank friends, family and the physicians who willingly helped and participated in the survey.

Abstract

Background: A patient handover refers to the transfer of care from one care provider to the next and involves three aspects: a transfer of information, responsibility and authority. Researchers and hospitals have been implementing different standardized models of handing over patients and giving trainings to their staff on how to use this models.

Objective: To assess the knowledge, attitude and practice of residents currently doing their residency at TASH towards the effectiveness of currently implemented handing over system of admitted patients and use of standardized methods.

Methods: A cross sectional survey was conducted which includes current residents at AAU, School of Health Science, using a structured questionnaire. Residents with previous attachment to the places where in-patient service is provided in TASH during the years 2018-2021 were included. The study was conducted from August 2021 – November 2021 G.C. They were provided with consent form to participate in the study and were asked to fill a structured questionnaire online. The data collection instruments was be coded and data was checked and entered using the software Microsoft Excel 2013. It was cleaned and edited accordingly and was exported to SPSS version 26.0 statistical package for analysis and checked for missing values before analysis. The Descriptive analysis was used frequency analysis.

Result: This study showed that residents are knowledgeable (n=245, 90.8%) about the consequences of poor handover on patient outcome, however, they lack knowledge (n=245, 3.1%) when it comes to standardized methods of handing over patients. Their attitude towards the current method they are using to handover patients is not good as well (n=245, 72.7%). Rather they showed good attitude (n=245, 87.6%) towards change to a standardized and proper way of handover. They also feel positive about possible training of all residents on this standardized methods. When it comes to practice, this study showed a significant amount of residents reported as having poor practice (n=245, 42.5%).

Recommendations and Conclusion: This survey has shown that poor handovers of patients during end of care are common in TASH and at times lead to bad patient outcome. It is therefore important to train and develop a system where standardized handovers are undertaken. Further studies can be done to compare if this new methods decrease the rate of patient harm as a result of poor handover.

List of Acronyms

AAU- Addis Ababa University

ANTICipate- Administrative Data; New clinical information; Tasks to be performed; Illness severity; and Contingency plans for changes.

EMR- Emergency Medicine resident

ER- Emergency

Gyn/Obs: Gynecology and obstetrics

I-PASS- Illness severity, Patient information, Action list, Situational awareness and contingency plans, and Synthesis by receiver

ICU- Intensive Care Unit

IMR- Internal Medicine resident

SBAR- Situation-Background-Assessment-Recommendation

SIGNOUT- Sick or DNR, Identifying data, General hospital course, New events of the day, Overall health status/clinical condition, Upcoming possibilities with plan, Tasks to complete overnight with plan, rational.

TASH- Tikur Anbessa Specialized Hospital

US- United States

UK- United Kingdom

Contents

List of Tables and Figures

1. Introduction

1.1 Background

Studies show medical errors affect one in 10 patients worldwide. One study shows that 180,000 people die each year partly as a result of iatrogenic injury.[1] In the US; Medical errors resulting in patient harm have become the major cause of death.[2, 3.] Among the different types of errors, miscommunications during transitions of care are being the main cause.[4-12] In Ethiopia, there is limited information regarding health professionals' ethics and surgical and medical error trends. One survey showed a prevalence was 57.6% but all was related to medication error in this study.[13]

A patient handover refers to the transfer of care from one care provider to the next.[14]This entails three important facets: a transfer of information, responsibility and authority. [15,16]Handovers therefore is a critical clinical and organizational process that occurs at all levels of the hospital; starting from an individual level (e.g. between nurses) [17] to an organizational level (e.g. between hospitals during patient transfers). [18]

Communication errors are a leading cause of sentinel events, unexpected occurrences involving death or serious physical injury, or the risk thereof.[19]The effects of end- of- rotation or 'service' transitions in care may be equally detrimental to patient care but have received substantially less attention.[12] During this transition, one physician permanently transfers the care of an entire list of patients to another physician. Unlike shift handovers, times at which the original physician resumes care during his/her next shift, service transition is permanent—the clinician signing out has no further contact with these patients or their new physcian.[20] While early studies show patients affected by these transitions suffer increased length of stay (LOS) and cost, [21, 22] multiple large- scale studies have suggested a significant increase in mortality in patients exposed to these transitions.[11, 12]

Organized structure facilitates care and recent work found that a structured handover template may improve perceived outcomes during resident end of shift or end of attachment, [23] but interventions aimed at service handover have not been extensively tested.

This study will therefore help in understanding the practice and knowledge of residents currently doing their residency in Addis Ababa University, school of medicine, that have previously attached to places where in-patient service is provided in TASH, towards the effectiveness of currently implemented off service system from their own most recent experience. The research will also address their knowledge and attitude as to what constitutes a good quality handover, whether they believe there is a gap in the system and whether other better methods of transferring patients information needs to be put in place.

1.2 Statement of the problem and Significance of the study

Most of the time what comes to mind when we think of medical error is medication or surgical related errors. This has been given an important focus motivated in part by data suggesting that substantial numbers of patients are harmed by it. However, recent reports from the United States show handovers having missing, incomplete, or inaccurate information are associated with adverse events.[24]

In 2000, the Institute of Medicine (IOM) reported that between 44,000 and 98,000 people die every year in U.S. hospitals because of medical errors.[25] Communication failures have been cited as the leading cause for a range of medical errors and adverse events in healthcare. In a study by Sutcliffe K, et al, they reported these errors to be nearly 70 %. [25]Almost half of these communication errors occurred during handovers between care providers.[26] There is no study in our country that shows the prevalence of the different causes of medical errors including communication errors.

Most studies done on handover usually focus on the practice of the health care providers but no papers were found that evaluate knowledge and attitude of physicians especially concerning standardized formats of patient transfer. Furthermore, studies that assess magnitude of poor handover of patients and the outcomes of patients are limited globally and absent in our country. Therefore this study will try to identify knowledge, attitude and practice gaps of residents towards standard patient handover. It will also be used for future studies aiming to do interventional researches.

2. Literature Review

Hospitals are the place where various methods of communication take place. Multiple numbers of healthcare professionals take care of the patients during any patient's treatment period in health care settings. Each caregiver working with a patient must provide accurate and updated information to other caregivers.[27] Experts on handovers have recommended, that a proper handover must take place in quiet settings, occur both face-to-face and written format using standardized checklist with active participation on both sides regarding issues not only of what happened but also anticipated events and future plans. It must also have only limited interruptions. Although they have derived this from research in non–health care industries it pertains true for hospitals as well.[28] In addition it is recommended that hospitals should provide training to their health care providers regarding how to properly transfer their patients at the end of their shift or attachment.[29]

Some key strategies have also been proposed such as (a) Use of standardization methods[30] for instance, with the use of structured templates[31]and communication mnemonics (e.gs. including SBAR, I-PASS, ANTICipate, SIGNOUT) [32] (b) the incorporation of training sessions to better train care providers perform effective handoffs [33,15]for instance, with the use of simulated clinical exercises, and finally (c) the use of tools such as online forms, [34] checklists[35] and other computerized technologies[30] that can provide a structure to guide healthcare providers to share important information

This recommendations are derived from the following studies.

One study comparing methods of handover, only 2.5% of patient information was retained using the verbal-only handover method, 85.5% was retained when using the using the verbal with note taking method and 99% was retained when a printed handout containing all patient information was used. [36]

A system review on impact of the communication and patient hand over tool SBAR on patient safety found from eight studies with a before–after design and three controlled clinical trials performed in different clinical settings [26] different patient outcomes were measured, of which eight were reported to be significantly improved. Eleven were described as improved but no further statistical tests were reported, and six outcomes did not change significantly. This study found moderate evidence for improved patient safety through SBAR implementation, especially when used to structure communication over the phone. However, there is a lack of high-quality research on this widely used communication tool.[37]

In a controlled study, done by Joshua lee Denson et al, a structured ICU end- of- rotation care transition strategy was implemented with high fidelity. [52] While mortality and LOS were not affected in a pilot study with limited power, the ambitious strategy of this intervention holds hope for future trials.

One study done in Indonesia on nurses in Nursing School of PPNI, West Java, Indonesia in the year 2019 where nurses were assessed on their knowledge, attitude, and practice of proper handover criteria mentioned above. Results showed the nurses had good knowledge (n=47, 77%) and positive attitude (n=42, 68.9%) toward patient handover. It also showed nurses with negative attitudes showed 5.333 times to develop poor clinical handover and nurses with poor knowledge had 5.280 times poor clinical handover performance.[39]

Another study done on medical students in Glasgow, Scotland on their prior knowledge and attitude towards standardized handover of patient was assessed after which training was given. Subsequently they were reassessed and both their knowledge and attitude improved. All students agreed or strongly agreed that their ability to perform a structured handover had improved. [40]

Some studies have shown, handovers in several hospitals as being "remarkably haphazard"[41] and "biformulaic, partial and cryptic". [42] In addition, several healthcare researchers and practitioners have also highlighted that poor "handovers often end in patient harm."[43] These are mentioned on the following paragraphs.

Prospective, observational study using video recording in an academic intensive care unit in Ontario, Canada evaluated use of handover transcripts documenting elements of three communication schemes: SBAR (Situation, Background, Assessment, Recommendations); SOAP (Subjective, Objective, Assessment, Plan); and a standard medical admission note. The majority of handovers' content consisted of recent and current patient status. The remainder included physicians' interpretations and advice. Questions posed by the incoming physicians accounted for 5.8% (± 3.9%) of the handovers' content. Elements of all three standardized communication schemes appeared repeatedly throughout the handover dialogs with no consistent pattern. For example, segments of SOAP's Assessment were present 5.2 (± 3.0) times in patient handovers; they followed Objective blocks in only 45.9% of the opportunities and preceded Plan in just 21.8%. Some components of communication were occasionally absent. For example, SBAR's Recommendation and admission note information about the patient's Past Medical History were absent from 22 (55.0%) and 20 (50.0%), respectively, of patient handovers[44]

Most reports of poor handover come following the recent mandatory reduction in working hours of residents in the US, which resulted in frequent handover of patients. Increased frequency of transfer of patients produces less-efficient care. This can be longer length of admission and increased use of laboratory tests. A study by Lofren et al showed transfer of care was associated with a 33% increase in the median length of stay, a 40% increase in the use of total laboratory tests, and a 20% increase in the number of laboratory tests per hospital day. [10]

Some researchers have highlighted the barriers to effective handovers,[14] while others have studied the consequences of poor handoverss.[45] The three major handover barriers identified in prior studies were related to communication challenges,[46,15]lack of a standard handover system[47,48]and lack of handover training for healthcare providers.[33] For example, Arora et al. [49] described that handover communication was mostly influenced by content omissions either related to medications, treatments, tests, consults or active medical problems and failure-prone

communication processes due to the absence of face-to-face communication, double sign-outs (night floats), and illegible/unclear notes.

Among studies regarding consequences of poor handover, a survey conducted in 2006 of all resident physicians in internal medicine and general surgery at Massachusetts General Hospital (MGH) concerning the quality and effects of handovers during their most recent inpatient rotations, the residents reported presence of harm to patients from problematic handovers to be as high as 59%. [7] In this study harm was divided as major and minor. Minor patient harm was defined a Limited clinical consequence—such as a need for more frequent monitoring or transient discomfort; may lead to prolonged hospitalization but without significant organ dysfunction or worsening of clinical condition. Major or significant harm was defined as follows: Significant clinical consequences such as deterioration in clinical status, organ dysfunction, prolonged hospitalization, disability beyond discharge, or death.[8]

Another study done by Joshua L. Denson, et al it showed that end-of-rotation resident handovers was significantly associated with an increase in both unadjusted and adjusted all-cause hospital mortality.[12]Although improved by the 2011 ACGME duty-hour regulations, a trend toward higher mortality remained following resident handover. A follow up study by the same researcher showed, among patients admitted to internal medicine services in 10 US Veterans Affairs hospitals, end-of-rotation transition in care was associated with significantly higher in-hospital mortality in an unrestricted analysis that included most patients.[11]

Considering this bad outcomes of a poor transition of care, it justifies a standardized system should be put in place. However a survey done by Leora I Horowitz et al showed that, although transfers of care are increasingly frequent, few internal medicine residency programs have standardized transfer of care systems in place, and most do not provide formal education in sign-out skills to all residents.[7]

3. Objectives

3.1 General Objective:

To assess Knowledge, Attitude and Practice of Residents towards Handover during Transitions of Care of Inpatient Patients in Tikur Anbessa Specialized Hospital

3.2 Specific objectives:

- To assess knowledge of proper handover.
- To assess attitude towards current handover method.
- To assess attitude towards change to standardized hand over methods.
- To assess the practice of handing over patients using their most recent attachments and the consequences of poor patient handover.

4. Methods and Materials

4.1 Study Area and Period

The study was conducted among current residents at AAU, School of Health Science, with previous attachment in the wards, ER and ICU at TASH.

The study was conducted from August 2021 – November 2021 G.C.

4.2 Study Design

The study was conducted as institution based cross sectional survey on current residents who had previous attachment to the Wards in TASH where in-patient services were provided.

4.3 Study population

The study population are Internal Medicine, Surgery, Pediatrics, Gynecology/Obstetrics, Neurology, Neurosurgery, Emergency Medicine, Urology, Pediatric Surgery, Orthopedic Surgery and Anesthesiology residents with previous attachment to wards, ER and ICU at TASH in the years 2018-2021. Their most recent attachment was used to decrease recall bias.

4.4 Inclusion and exclusion criteria

4.4.1 Inclusion criteria

- All Internal Medicine, Surgery, Pediatrics, Gynecology/Obstetrics, Neurology, Neurosurgery, Emergency Medicine, Urology, Pediatric Surgery, Orthopedic Surgery and Anesthesiology residents
- Residents with previous attachment to wards in TASH where Inpatient services are given
- Residents who have given consent to participate in the study

4.4.2 Exclusion criteria

- Residents with no previous history of attachment to wards where inpatient services are given in TASH
- Residents not willing to participate in the study

4.5 Sampling technique and sample size

Using the single proportion formula with a 95% CI, 5% margin of error; P-value of 59% (obtained from the percent reporting harm (major or minor) to one or more patients from problematic handoffs in their most recent rotations from the study titled "Handoffs Causing Patient Harm: A Survey of Medical and Surgical House Staff" published on the The Joint Commission Journal on Quality and Patient Safety in the year 2008) the sample size was calculated to be 243.

4.6 Data collection instruments and techniques

All residents were provided with consent form to participate in the study and were asked to fill a structured questionnaire administered via Google forms. The questionnaire is adapted and modified from the study done by Barrett T. Kitch, M.D., et titled "Handoffs Causing Patient Harm: A Survey of Medical and Surgical House Staff" published on the The Joint Commission Journal on Quality and Patient Safety in the year 2008.

4.7 Variables

The independent variables in this study are:

- Type of residency the participant is doing
- The year of the current residency
- Time of the last inpatient attachment.
- Place of the last inpatient attachment

The dependent variables in this study are:

- The resident knowledge of what constitutes a proper off service handover of patients
- The resident's attitudes towards the quality of handovers and the need for a new standardized handing over method.
- The residents practice of handing over patients during their most recent inpatient attachment.

4.8 Data analysis

Collected data instruments was cleaned using Microsoft Excel 2013 and was exported to SPSS version 26.0 statistical package for coding and analysis after being checked for missing values. Descriptive analysis was used for frequency analysis.

4.9 Operational Definition

- The **overall knowledge** was categorized, using Bloom's cut-off point, as good if the score was between 80 and 100%, moderate if the score was between 60 and 79%, and poor if the score was less than 60%. [53]
- The **overall attitude** was categorized, using Bloom's cut-off point, as good if the score was between 80 and 100%, moderate if the score was between 60 and 79%, and poor if the score was less than 60%. [53]
- The **overall practice** score will be categorized using the same Bloom's cut-off point, as good if the score will be between 80 and 100%, moderate if the score will be between 60 and 79%, and poor if the score will be less than 60%. [53]
- **Handovers (also called hand off or sign-outs):** are defined as the communication of information to support the transfer of care and responsibility for a patient from one physician to another.
- **Off-service Handover**: handover done during transition that are permanent—the clinician signing out has no further contact with these patients or their new care team.
- **Problematic Handover**- are handovers that include inaccurate, incomplete or misleading information.

4.10 Data Quality Control Method

Prior to the data collection, the data collection format was cross-checked with available information, then the study questionnaires were organized in to sections. Completeness of the data was assessed and incomplete data was rejected.

5. Ethical Considerations

Ethical clearance was obtained from the ethical review committee from Addis Ababa University, College of Health Sciences, Department of Internal Medicine. Informed consent was obtained from a study participant.

6. Plans of disseminating the findings of the study

Results of the study will be submitted to the department of Internal Medicine, School of Medicine College of Health Sciences at Addis Ababa University as part of the dissertation requirement for the postgraduate certificate program in Internal Medicine and will be presented in a seminar prepared by the research committee for all staff and residents in the department. It will also be distributed to medical journals for possible publication.

7. Results

7.1 Study Demographics

The survey included 245 residents. Table 1 shows the characteristics of the survey respondents. Majority of the residents that participated in the study were from internal medicine (23.7%).

Table 1: List of Residents

	Frequency	Percent	Cumulative Percent
Anesthesia and Critical Care	10	4.1	4.1
Emergency Medicine	25	10.2	14.3
General Surgery	38	15.5	29.8
Gynecology and Obstetrics	37	15.1	44.9
Internal medicine	58	23.7	68.6
Neurology	10	4.1	72.7
Neurosurgery	9	3.7	76.3
Orthopedic Surgery	11	4.5	80.8
Pediatric Surgery	4	1.6	82.4
Pediatrics	37	15.1	97.6
Urology	6	2.4	100.0
Total	245	100.0	

Among these residents 34.3, 28.6, 28.6, 7.8, 0.8 percent were first, second, third, fourth and fifth year in their residency programs. The majority had attachment to in-patient i.e wards, ICU and kept emergency patients, in the past 01 month.

Of the 245 participants 49% had attachment to inpatient within this last 01 month, 22% within in the last 1-6 months, 14.7% within the last 6-12 months and 14.3% had their attachments more than a year back.

Among the places of attachment, the wards were the recent place of attachments for most residents (54.3%) followed by the Emergency (24.1%) then ICU (21.6%).

7.2 Knowledge Assessment

Questions asked to assess knowledge on proper handover and consequences of poor handover and their result is summarized on table 3.

Table 3. knowledge on proper handover and consequences of poor handover

Questions	True	False
1. Effective Communication is essential for Provision of safe patient care?	100%(245)	0%
2. Poor handover is a type of ineffective communication	100%(245)	0%
3. Miscommunication is a type medical error	100% (245)	0%
4.Poor communication can lead to Inaccurate patient plan leading to harm	93.8%(230)	7.2%(15)
5.Poor communication can lead to delay in transfer of patient to appropriate wards	87.7%(215)	12.3%(30)
6. .Poor communication can lead to delay in discharging patients	81.6%(200)	18.4%(45)
7.Poor communication can lead to unnecessary Lab tests	79.5%(195)	20.5%(50)
8.Poor communication can lead to Uninformed patient or caretaker	84.4%(207)	15.6%(38)

With these results the overall score regarding knowledge on proper handover and consequences of poor handover was 90.87%. This shows residents have good knowledge in this matter. However when knowledge of standardized patient handing over methods were assessed the results were different.

When it comes to knowledge of standardized models of handover, only 15.9% of the residents were aware of SBAR method but none were aware of other methods. This shows residents have poor knowledge when it comes to standardized methods of handing over patients.

7.3Attitude Assessment

First, residents were asked their opinion on the current non-standardized method of handing over patients that is being implemented in the hospital from their most recently completed inpatient (ward/ICU) rotation. The resulted showed 72.7% think the handovers are either fair or poor while 27.3% think it was good or excellent.

Next, attitudes towards change to standardized model of handover was assessed.

Table 6. Attitudes towards change to standardized model of handover

Questions	Agree or Strongly agree	Disagree or Strongly disagree	Neutral
1. Do you think miscommunication can be successfully avoided	86.1%(211)	13.1%(32)	0.8%(2)
2. Do you think standardized handover method using checklists is necessary?	71%(174)	15.9%(39)	13.1%(32)
3. Do you think handing over should be done only face-to-face	11.8%(29)	86.9%(213)	1.2%(3)
4. Do you think Handover should be done only in written format	8.1%(20)	89.7%(220)	2%(5)
5. Do you think handovers should be done both verbally and in written format?	96.3(236)	0.8%(2)	7(2.8%)
6. Do you think handovers should be done in a quiet place where active involvement of every participant is possible?	98.7%(242)	0%	1.2%(3)
7. Do you think training on standardized handing over of patients should be given to all residents?	84.8%(208)	4.8%(12)	10.2%(25)

This shows the overall opinion towards change to standardized handover done both in written format and face-to-face with a possible training to all residents is 87.6% which shows residents have good attitude.

7.4 Practice Assessment

First, possible frequency of problematic handovers were assessed. Residents were asked to answer the questions based on their most recent inpatient attachments. By taking the percent of residents that answered sometimes, often and always 62.4% of residents indicated problematic handovers that were missing information and 50.6% of residents were uncertain about management decisions because they lacked patient information.

Second, the characteristics and contents of handovers was assessed. It showed the most common ways of handing over patients (often and always), 58.3% of residents reported it being done in written format while 49.4% of residents reported face-to-face handover. Face-to-face handover with accompanying written documentation was reported by only 11.8% of the residents. Among those handovers done face-to-face, 58.3% of residents reported that the handovers were interrupted one or more times. When it comes to the setting where handovers were conducted, 38.8% of residents reported it to be done in a quite or private place and 52% reported that the opportunity to ask or respond to questions was possible.

In regards to the content of handover, residents reported the patient identifier (98%), principal reason for admission (93.4) and current clinical condition of the patient (92.7%) as the most included data in the handover whereas anticipated events for a period of coverage (19.6%), the name of the responsible senior physician (25.7%) and tasks to be completed (26.5%) were the ones that were least included.

Finally, the consequences of problematic handover was assessed using the resident's most recent inpatient attachments. The first question assessed difficulty in communicating to other caretakers, patients or patient attendants as a result of receiving incomplete handover. The results showed around 39% of residents reported having difficulty in providing accurate information to other health care provider, patients or patient attendants as a result of receiving problematic handover.

Second the consequences of problematic handover on the wellbeing of the patient was assessed. The residents were asked to identify problems which resulted to the patient because of this poor handover from their most recent inpatient attachments. This problems were divided into major and minor harm.

The minor harm or limited clinical consequences was defined as a need for more frequent monitoring or transient discomfort; may lead to prolonged hospitalization but without significant organ dysfunction or worsening of clinical condition. While Major or Significant Harm was defined as significant clinical consequences such as deterioration in clinical status, organ dysfunction, prolonged hospitalization, disability beyond discharge, or death.

Half of the residents reported some kind of harm to the patient had occurred with majority being minor (49.8%) while 29% reported major harm that occurred because of being given a problematic handover.

In conclusion, this table summarizes findings of practice assessment

Table 13. Summary of assessment of practice

	Percent
Received complete handover	37.6%
No Problematic handover leading to uncertainty in decision making	49.4%
Handovers being done in both verbal and written format	11.8%
Non-Interrupted handovers	41.7%
Conducted in a Quiet place	38.8%
Conducted in an environment allowing for questions to be asked and responses to be made	52%
Able to provide information to patients, patient's attendants and other health care providers	61%
No harm to the patient because of problematic handover	48.4%
Average Result	42.5%

With this summary, we can conclude that the current handover practice fails to fulfil the required criteria that are needed for a good quality handover of patients.

7.5 Additional Analysis

Furthermore, the frequencies of report of harm done to patients was determined based on the residents' department. Additionally the places (wards, ICU, ER) were assessed to find out where the highest frequency of this problems occurred. The next two graphs summarize the findings.

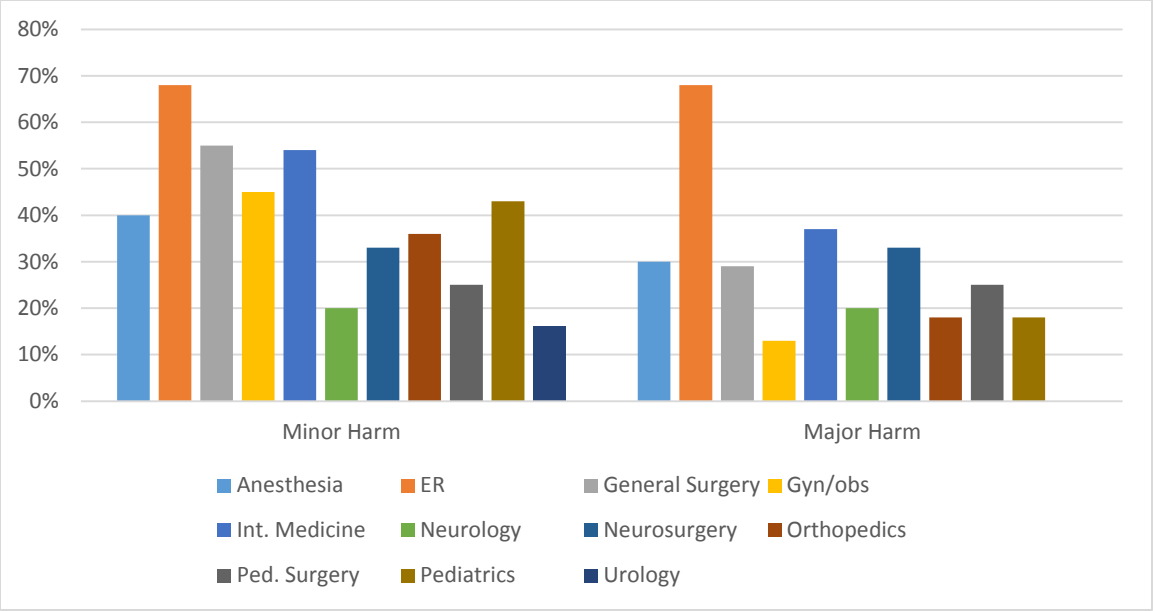

Fig 1. Frequency of harm to the patients reported by residents based on departments

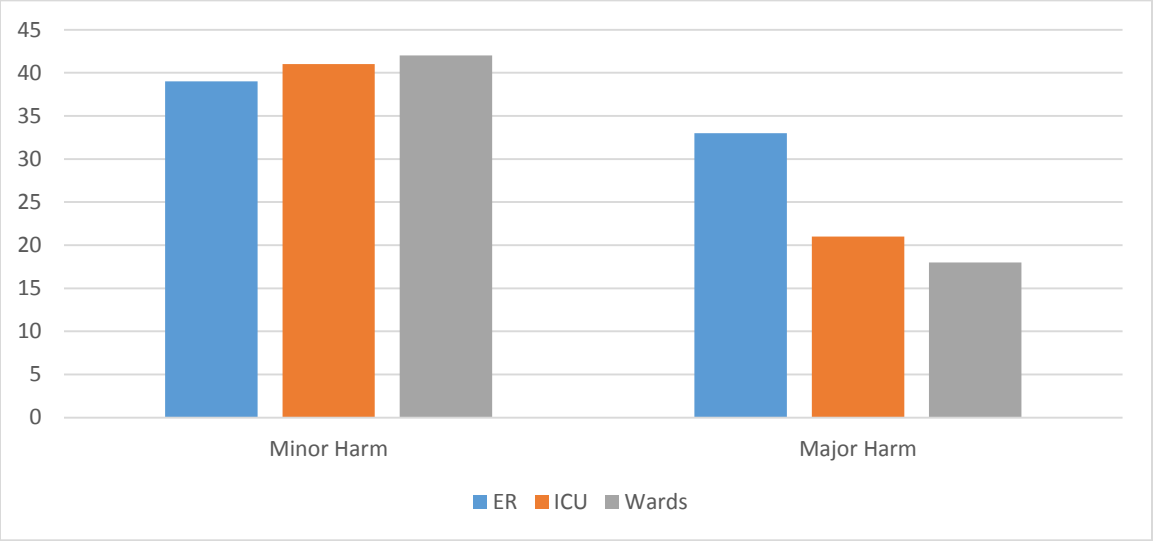

Fig 2. Places where the highest frequency of harms to the patient because of problematic handover

This results show residents from Emergency department reported the highest rates of both minor and major harm to patients as a result of problematic handover of patients. In addition, when all residents were combined the highest rate of major harm occurred during their attachments at the Emergency followed by ICU. Minor harms were reported at comparable rates in all three places.

When it comes to characteristics of the handovers, considering residents who answer often and always, face-to-face handover was more common in general surgery and gynecology departments as compared to internal medicine, neurology, urology and anesthesiology departments where written form of handover was reported to have been commonly used. Even though rate of handing over both in written and face-to-face format is low, it is practiced more in the neurology and internal medicine departments. Results are summarized on the next graph.

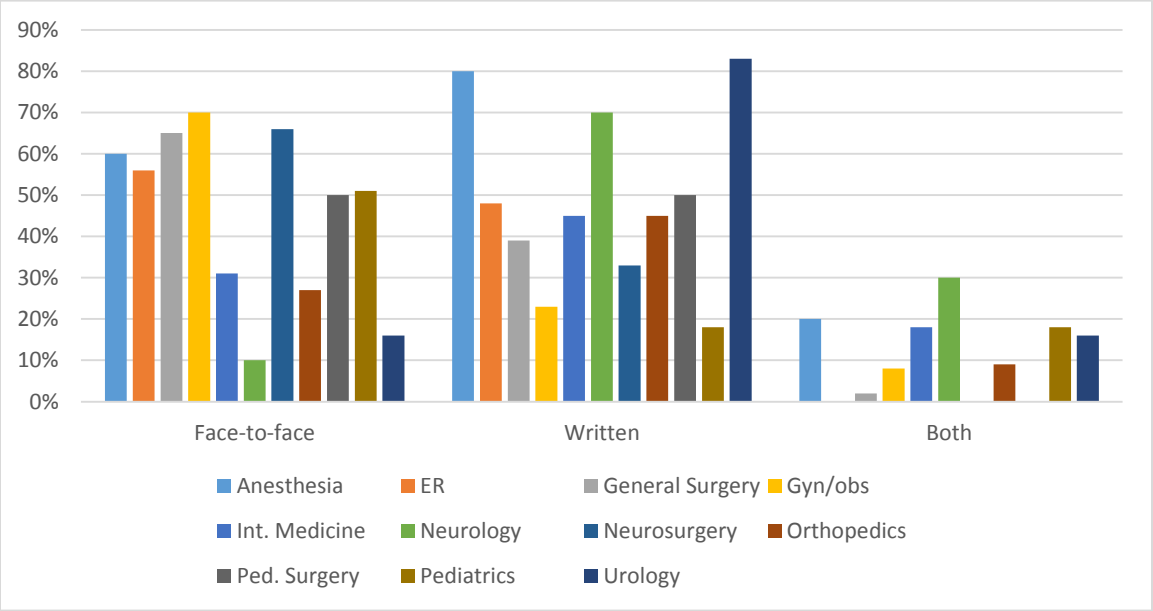

Fig 3. Characteristics of the handovers based on the different departments

Regarding setting, the place reported to have the highest likelihood of having an interrupted handover was the ICU, followed by the emergency then wards as shown on the next figure.

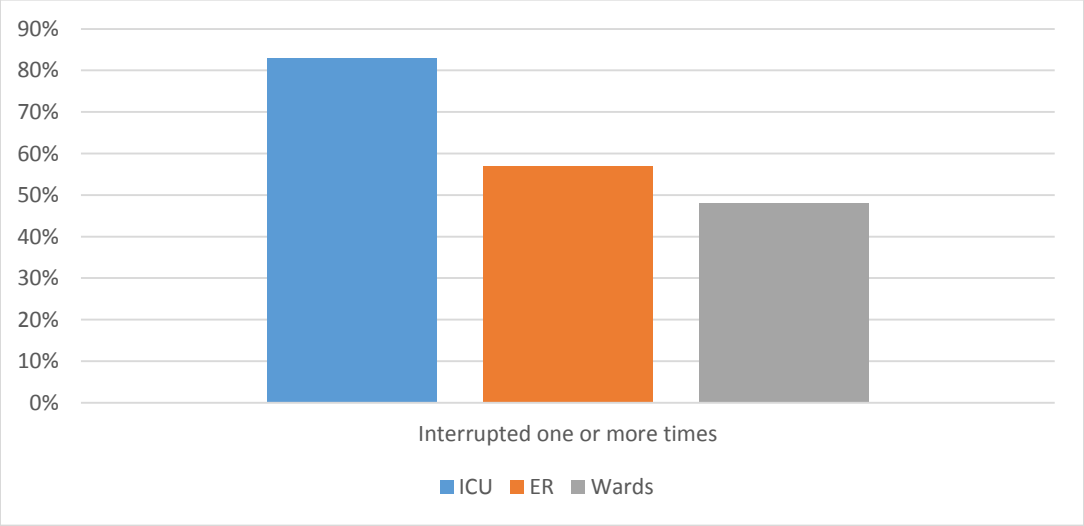

Figure 4. Setting where handovers were interrupted one or more times

8. Discussion

The purpose of this research was to assess how much residents know about the concept of a proper handover and their attitude towards it. In addition, it was also done to assess and evaluate the way the residents are handing over their patients currently and whether it fulfills the criteria required for a handover to be of good quality as described in the literature review.

The study has included almost all departments in TASH who provide inpatient service except for oncology. This makes this study better when compared to a similar study done by kitch done at Massachusetts General Hospital (MGH) in 2006 concerning the quality and effects of handoffs during their most recent inpatient rotations, [8] which included only internal medicine and general surgery residents. However the academic year of the residents was more or less similar (38.5%, 28%, 26.1%, 2.5% and 2.5% of 1st, 2nd, 3rd, 4th, 5th year respectively).The last place the residents have attached are also similar except the current study included more residents whose recent attachment was at the ER. (46.9%, 20.3% and 14.1% had last attachment at ward, ICU, and ER respectively).

Similar to the study in Indonesia on nurses in the year 2019, [39] this study showed the study subjects are knowledgeable (n=245, 90.8%) about poor handovers and their consequences, however, they lack knowledge (n=245, 3.1%) when it comes to standardized methods of handing over patients.

Similarly, they showed good attitude (n=245, 87.6%) towards proper way of handover. They also feel positive about possible training of all residents on this standardized methods. Their attitude towards the current method they are using to handover patients is not good as well (n=245, 72.7%). This attitude is different to the study done by kitch in 2006 which showed only about a third (31.0%) of residents at MGH rated the overall quality of the handoffs they received on their most recent rotation as fair or poor. This result discrepancy might be in the kitch study most handovers occurred face to face and the setting was mostly in the wards.

When it comes to practice, this study showed a significant amount of residents reported as having received incomplete handovers with several omitted patient data (n=245, 62.4%). Similar to the prospective study done in Ontario, Canada on handover patterns: an observational study of critical care physicians, the handovers had elements of all standardized communication schemes but with no consistent pattern. The physicians in this Canadian study followed objective blocks in only 45.9% of the opportunities. Again in similarity with this study, the majority of handovers' content consisted of recent and current patient status.

This handovers happened usually only in written format (n=245, 58.3%) or face to face (n=245, 49.4%) and only occasionally in both ways (n=245, 11.8%).58.3% of residents reported that the handovers were interrupted one or more times and only 38.8% reported it being done in a quiet place. Compared to the Kitch study, virtually all residents (93.6%) reported that face-to-face handoffs occurred most of the time or always. However, almost half of residents (43.6%) reported that these handoffs were rarely or never conducted in a quiet, private setting. More than one third (36.6%) reported that the handoffs were most of the time or always interrupted one or more times.

Reporting on events from only their most recently completed rotation, 49.8% of residents included in this study reported that at least one patient had a minor harm by a problematic handoff and 29.4% reported that at least one patient had suffered major harm. This results differ to the study by kitch which showed a result where 59% of residents reported that one or more patients had been harmed during their most recent clinical rotation because of problematic handoffs with 58.3% reported minor harm and 12% reported that the harm had been major. The discrepancy in the rate of major harm results might be because the MGH study included only internal medicine and surgery residents while this study included many other departments including Emergency medicine residents who had reported the highest frequency of harms.

The frequency of problematic handovers varied by location in the MGH study as well, similar to this study, the emergency was the place with the highest rate of poor handovers but contrary to this study, both medical and surgical residents reported intensive care units (ICUs) as the location with the lowest frequency.

Regardless, this study showed reports of significant number of worse outcomes to patients because of poor handover that cannot be ignored similar to other studies

9. Strength and Limitation of the study

9.1 Strength of the Study

One of the major strength of this survey is that it tried to identify the magnitude of problematic handovers and its complications in admitted patients. It also tried to assess the current knowledge and attitude of residents towards proper standardized handover methods. All this was done for the first time as an institutional basis.

9.2 Limitations of the study

This study has several limitations. First, more than one resident may have reported the same harm. For example, two different residents may have noticed harm to one patient and both may have reported the same patient when they completed their surveys. Therefore, fewer actual patient harm events may have contributed to the 124 that were reported in this survey. Second, data on patient harm and its cause being a problematic handovers were based on the assumptions of resident physicians, and were not checked through either direct observation or a medical record review. Even though the definition of minor and major harm was provided to the respondent, it cannot be confirmed that the reported events actually caused patient harm or that the harm was attributable to a problematic handover. Residents may also have failed to report events that another colleague would have noticed. In addition some of the residents who participated in this study might have completed their in-patient attachments several weeks or months by the time they participated in this study, which might cause recall bias. Finally, the exact time of the day the handovers took place or whether it was end of shift handover (occurring by the end of day or night shift) or end of attachment (eg. after one month of attachments) was not clearly mentioned. These factors are important in assessing quality of the handovers in the transmission of key clinical information. Finally another limitation that is almost seen in any survey is the potential for nonresponse bias. Although response rate was good, the distribution of residents across different departments was not even.

10. Conclusion

The results of this study suggest that residents in multiple departments of TASH perceive that patient harm from problematic handover is common. It also suggest that best-practice recommendations for handovers are not consistently being observed. It shows that though residents lack knowledge on standardized models they are well aware about poor handovers and their consequence and have good opinion to changing the practice by incorporating standardized models and by taking trainings on proper handover methods.

11. Recommendations

Miscommunication should be recognized as preventable and amenable to process improvement. The culture should change from one of viewing handover related harm as inevitable to one in which error minimization is possible. Second training programs and hospitals should create an awareness that handovers must be conducted in quiet settings and also provide such settings. Others should also be trained to limit interruptions. It shall be conducted so that they include an opportunity and time for the recipient to ask questions and give response. The variability observed in the content of handovers, and experts' views on best practices, suggests that implementation of a standardized handover format may be important. Finally, further detailed investigations into the settings and mechanisms, by which problematic handovers lead to harm are needed, along with interventional studies comparing standardized and non-standardized methods of handover. Ongoing institutional efforts to improve the safety and care of hospitalized patients are vital.

12. References

1. Leape LL (1994). "Error in medicine". JAMA. 272 (23): 1851–7. doi:10.1001/jama.272.23.1851. PMID 7503827

2. Landrigan CP, Parry GJ, Bones CB, et al. Temporal trends inates of patient harm resulting from medical care. N Engl J Med2010;363:2124–34.

3. Makary MA, Daniel M. Medical error- the third leading causof death in the US. BMJ2016;353:i2139.

4.Abraham J, Nguyen V, Almoosa KF, et al. Falling through the cracks: information breakdowns in critical care handoff communication. AMIA AnnuSymp Proc2011;2011:28–37.

5.Starmer AJ, Sectish TC, Simon DW, et al. Rates of medical errors and preventable adverse events among hospitalized children following implementation of a resident handoff bundle. JAMA2013;310:2262–70.

6.Starmer AJ, Spector ND, Srivastava R, et al. Changes in medical errors after implementation of a handoff program. N Engl J Med2014;371:1803–12.

7 . Horwitz LI, Moin T, Krumholz HM, et al. Consequences of inadequate sign- out for patient care. Arch Intern Med2008;168:1755–60.

8 Kitch BT, Cooper JB, Zapol WM, et al. Handoffs causing patient harm: a survey of medical and surgical house staff. JtComm J Qual Patient Saf2008;34:563–70.

9 Solet DJ, Norvell JM, Rutan GH, et al. Lost in translation: challenges and opportunities in physician- to- physician communication during patient handoffs. Acad Med 2005;80:1094–9.

10 Lofgren RP, Gottlieb D, Williams RA, et al. Post- call transfer of resident responsibility: its effect on patient care. J Gen Intern Med1990;5:501–5.

11 Denson JL, Jensen A, Saag HS, et al. Association between end- of- rotation resident transition in care and mortality among hospitalized patients. JAMA2016;316:2204–13.

13. Endalamaw, Aklilu & Dessie et al, Medication Errors in Ethiopia: Systematic Review and Meta-Analysis. 10.21203/rs.3.rs-35808/v1, 2020

14 Denson JL, McCarty M, Fang Y, et al. Increased mortality rates during resident handoff periods and the effect of ACGME duty hour regulations. Am J Med2015;128:994–1000.

14. Riesenberg LA, Leitzsch J, Massucci JL, Jaeger J, Rosenfeld JC, Patow C, et al. Residents' and Attending Physicians' Handoffs: A Systematic Review of the Literature. Academic Medicine. 2009;84(12):1775-8710.097/ACM.0b013e3181bf51a6.

15. Arora V, Johnson J, Meltzer D, Humphrey H. A theoretical framework and competency-based approach to improving handoffs.Quality and Safety in Health Care. 2008;17:11 - 4.

16. Strople B, Ottani P. Can Technology Improve Intershift Report? What the Research Reveals. Journal of Professional Nursing. 2006 2006/6//;22(3):197-204.

17. Staggers N, Jennings BM. The Content and Context ofChange of Shift Report on Medical and Surgical Units.Journal of Nursing Administration. 2009;39(9):393810.1097/NNA.0b013e3181b3b63a.

18. Craig SS. Challenges in arranging inter-hospital transfers from a small regional hospital: an obvervationalstudy. Emergency Medicine Australasia. 2005;17:124-31.

19. The Joint Commission. Sentinel event statistics data: root causes by event type. http://www.jointcommission.org/sentinse_event_statistics.

20. Joshua Lee Denson,JulieKnoeckel, Sara Kjerengtroen et al, Improving end-of-rotationtransitions of care among ICU patients, BMJ QualSafEpub, 2019

21. Rich EC, Gifford G, Dowd B. The effects of scheduled intern rotation on the cost and quality of teaching hospital care. EvalHealth Prof1994;17:259–72.

22 Smith JP, Mehta RH, Das SK, et al. Effects of end- of-month admission on length of stay and quality of care among inpatients with myocardial infarction. Am J Med2002;113:288–93

23. Nanchal R, Aebly B, Graves G, et al. Controlled trial to improve resident sign- out in a medical intensive care unit. BMJ Qual Saf2017;26:987–92.

24. Borowitz S.M., et al.: Adequacy of information transferred at resident sign-out (in hospital handover of care): A prospective survey. Qual Saf Health Care 17:6–10, Feb. 1, 2008.

25. Sutcliffe,Lewton, Marilynn Communication Failures: An Insidious Contributor to Medical Mishaps, Academic medicine, Vol. 79, No. 2, February 2004

26. National Patient Safety Goals, (2006).

27. The Joint Commission on Accreditation of Healthcare Organizations. Accreditation program: Hospital. National patient safety Goals. 2008.

28. Boat AC, Spaeth JP: Handoff checklists improve the reliability of patient handoffs in the operating room and postanesthesia care unit. Paediatr Anaesth 2013; 23:647–54

29. Bismilla Z, Wong B. Handover Toolkit: A resource to help teach, assess and implement a handover improvement program. Royal College of Physicians and Surgeons of Canada; 2018.

30. Van Eaton EG, Horvath, K.D., Lober, W.B., Pellegrini, C.A. Organizing the transfer of patient care information: The development of a computerized resident sign-out system. Surgery. 2004;136:5-13.

31. Patterson E, Roth E, Woods D, Chow R, Orlando GomesJ. Handoff strategies in settings with consequences for failure: lessons for health care operations. International Journal for Quality in Health Care. 2004;16:125 - 32.

32 Haig K, Sutton, S, Whittington, J. SBAR: A shared mental model for improving communication between clinicians. JtComm J Qual Patient Saf.2006; 32:167-75.

33. Horwitz L, Moin T, Green M. Development and Implementation of an Oral Sign-out Skills Curriculum. Journal of General Internal Medicine.2007;22(10):1470-4.

34. Arora V, Johnson J. A model for building a standardized hand-off protocol.JtComm J Qual Patient Saf. 2006;32(11):646 – 55

35. Stein DM, Vawdrey DK, Stetson PD, Bakken S, editors. An Analysis of Team Checklists in Physician SignoutNotes, AMIA AnnuSymp Proc 2010

36. Bhabra, Gevdeep et al. “An experimental comparison of handover methods.” Annals of the Royal College of Surgeons of England vol. 89,3 (2007): 298-300. doi:10.1308/003588407X168352

37. Müller M, Jürgens J, Redaèlli M, et alImpact of the communication and patient hand-off tool SBAR on patient safety: a systematic reviewBMJ Open 2018;8:e022202. doi: 10.1136/bmjopen-2018-022202

38. Denson JL, Knoeckel J, Kjerengtroen S, et al, Improving end- of- rotation transitions of care among ICU patientsBMJ QualSafEpub,2019

39. Lilis Suryani1, Faridah Binti Mohd Said, Empowering the Implementation of Patient Handover withIncreasing Nurse Knowledge and Attitude at X General Hospital in Indonesia, Malaysian Journal of Medicine and Health Sciences (eISSN 2636-9346),2017

40. Holt N, Crowe K, Lynagh D, et alIs there a need for formal undergraduate patient handover training and could an educational workshop effectively provide this? A proof-of-concept study in a Scottish Medical SchoolBMJ Open 2020;10:e034468. doi: 10.1136/bmjopen-2019-034468

41. Volpp KGM, Grande D. Residents' suggestions for reducing errors in teaching hospitals. N Engl J Med. 2003;348:851-5

42. Payne B, Hardey H, Coleman P. Interactions between nurses during handovers in elderly care. Journal of Advanced Nursing. 2000;32:277-85.

43. Ruth. Resident Handoffs Often End in Patient Harm. Emergency Medicine News: . 2009;31(3):1, 6.

44. Ilan, R., LeBaron, C.D., Christianson, M.K. et al. Handover patterns: an observational study of critical care physicians. BMC Health Serv Res 12, 11 (2012). https://doi.org/10.1186/1472-6963-12-11

45. Streitenberger K, Breen-Reid K, Harris C. Handoffs in Care--Can We Make Them Safer? Pediatric Clinics ofNorth America. 2006;53(6):1185-95.

46. Berkenstadt H, Haviv Y, Tuval A, Shemesh Y, MegrillA, Perry A, et al. Improving Handoff Communications in Critical Care*. Chest. 2008 July 2008;134(1):158-62.

47. Vidyarthi AR, Arora V, Schnipper JL, Wall SD, Wachter RM. Managing discontinuity in academic medical centers: Strategies for a safe and effective resident sign-out. Journal of Hospital Medicine. 2006;1(4):257-66.

48. . Apker J, Mallak L, Gibson S. Communicating in the "gray zone": perceptions about emergency physician hospitalist handoffs and patient safety. Academic emergency medicine : official journal of the Societyfor Academic Emergency Medicine. 2007;14(10):884-94.

49. . Arora J, J, Lovinger D, Humphrey HJ, Meltzer DO. Communication failures in patient sign-out and suggestions for improvement: a critical incident analysis. Quality and Safety in Health Care. 2005 14(6):401-7.

50. Feleke BT, Wale MZ, Yirsaw MT (2021) Knowledge, attitude and preventive practice towards COVID-19 and associated factors among outpatient service visitors at Debre Markos compressive specialized hospital, north-west Ethiopia, 2020. PLoS ONE 16(7): e0251708. https://doi.org/10.1371/journal.pone.0251708

Appendix

Consent Form

Informed Consent Form

You will be invited to participate in Knowledge, Attitude and Practice of Residents towards Handover of patient during End-of-Rotation Transitions of Care of Inpatient patients Tikur Anbessa Specialized Hospital. This informed consent form provides you with some information. Please read the following information and decide whether to participate in this study.

The main purpose of this study is to assess the overall Knowledge, Attitude and Practice of Residents towards handover during End-of-Rotation Transitions of Care of Inpatient Patients in Tikur Anbessa Specialized Hospital. The survey will be conducted via questionnaire administered online.

The information that will be obtained in this survey is only for scientific research without any commercial interests. All responses are anonymous (there is no way to link your responses to you as an individual). If you have any questions about this research, you can ask the researcher. You can also refuse to participate in the study or withdraw from the study at any time during the study, which will not affect your relationship with the researcher and will not affect your rights.

If you agree to this study, please select the best answer for each question. You may skip those questions you do not wish to answer.

Data collection questionnaire

Definition of terms

Handover (also called hand off or sign-outs): are defined as the communication of information to support the transfer of care and responsibility for a patient from one physician to another. Handovers occur at the beginning and ends of shifts, surrounding weekends, at the beginning and ends of rotations, and when patients are transferred from one area of the hospital to another (such as when a patient is transferred from the Emergency Department to an inpatient ward). In the ICU's, we consider handovers to be the transmission or signing-out of information at shift changes (e.g. morning and evening rounds).

Off-service Handover: handovers done during transition that are permanent—the clinician signing out has no further contact with these patients or their new care team.

Problematic Handover- Problematic handover are handoffs that include inaccurate, incomplete or misleading information.

1. **Demography**

1. What residency are you currently doing (response categories: Internal Medicine, Surgery, Pediatrics, Gynecology/Obstetrics, Neurology, Neurosurgery, Emergency Medicine, Urology, Pediatric Surgery, Orthopedic Surgery and Anesthesiology)

2. What year are you in your residency program? (Response categories: first, second, third, fourth, fifth)

3. When was your last Inpatient (ward/ICU) Attachment (Response categories: within this one month, within the last 1-6 months, more than a year)

4. Where was your last inpatient attachment (Response categories: Ward, ICU, ER)

2. **Knowledge Assessment**

1. Please answer True or False to these questions

a. Effective Communication is essential for Provision of safe patient care?

b. Poor handover is a type of ineffective communication

c. Miscommunication is a type medical error

d. Poor communication can lead to inaccurate patient plan leading to harm

e. Poor communication can lead to delay in transfer of patient to appropriate wards

f. Poor communication can lead to delay in discharging patients

g. Poor communication can lead to unnecessary Lab tests

h. Poor communication can lead to uninformed patient or caretaker

2. Among the following standardized tools of handing over patient, which one are you familiar with? (More than can be selected)

a. SBAR

b. I-PASS

c. ANTICipate

d. SIGNOUT

e. Other (if yes, please specify)

3. Attitude Assessment

1. How would you rate the overall quality of the handover you received? (Response categories: Excellent, good, fair, poor)

2. Do you think miscommunication can be successfully avoided (Response categories: Strongly Agree, Agree, Neutral, Disagree, Strongly disagree)

3. Do you think standardized handover method using checklists is necessary? (Response categories: Strongly Agree, Agree, Neutral, Disagree, Strongly disagree)

4. Do you think handing over should be done only face-to-face? (Response categories: Strongly Agree, Agree, Neutral, Disagree, Strongly disagree)

5. Do you think Handover should be done only in written format? (Response categories: Strongly Agree, Agree, Neutral, Disagree, Strongly disagree)

6. Do you think handovers should be done both verbally and in written format? (Response categories: Strongly Agree, Agree, Neutral, Disagree, Strongly disagree)

7. Do you think handovers should be done in a quiet place where active involvement of every participant is possible? (Response categories: Strongly Agree, Agree, Neutral, Disagree, Strongly disagree)

8. Do you think training on standardized handing over of patients should be given to all residents? (Response categories: Strongly Agree, Agree, Neutral, Disagree, Strongly disagree)

4. Practice Assessment

1. In your most recently completed inpatient (ward/ICU) rotation please rate how often you experienced problems with missing, incomplete or inaccurate information with the handover. (response categories: Never, Rarely, Sometimes, Often, N/A)

2. In your most recently completed inpatient (ward/ICU) rotation, when managing a patient you were just recently handed over, how often did you find yourself uncertain about management decisions because you lacked patient information?(such as recent exam or test results, details of the patient's clinical course or management plan, etc) (response categories: Never, Rarely, Sometimes, Often)

3. In your most recently completed inpatient (ward/ICU) rotation, how often were the following included in the change-of-shift sign-outs you received, either verbally or in writing? (response categories: Never, Rarely, Sometimes, Most of the time, Always)

    a. Patient identifiers such as name and medical records number (bed number is not considered a patient identifier)
    b. Length of stay
    c. the name of the senior or responsible physician
    d. the principle reason for admission
    e. status of life sustaining orders for critical patients (for eg. Pressors or mechanical ventilator support etc…)
    f. all major active clinical issues
    g. trend of lab results and previously used medications(such as antibiotics)
    h. anticipated events for period of coverage
    i. current clinical condition of patient
    j. tasks to be completed during period of coverage

4. In your most recently completed inpatient (ward/ICU) rotation, how often the change-of-shift sign-outs you received were conducted… (response categories: Never, Rarely, Sometimes, Most of the time, Always)
    a. face-to-face?
    b. over the phone?
    c. in an electronic or written format without a verbal discussion?
    d. verbally (face to face or over the phone) without an accompanying written sign-out?

5. In your most recently completed Inpatient (ward/ICU) rotation, how often were the change-of-shift sign-outs you received… (response categories: Never, Rarely, Sometimes, Most of the time, Always)

    a. Interrupted one or more times? (to attend to patient care or other issues not directly related to sign-out)
    b. Conducted in a quiet, private setting? (such as a conference room, office, etc.)
    c. Conducted in a way that allowed for an opportunity for questions to be asked or responded to?

6. In your most recently completed Inpatient (ward/ICU) rotation how often did problems with handovers lead to your being unable to provide accurate or complete information to… (response categories: Never, Rarely, Sometimes, Most of the time, Always)

    a. a patient or patient's family?
    b. a nurse or technician?
    c. another resident physician?
    d. an attending physician (fellow) ?
    e. a consulting physician?

7. In your most recently completed inpatient (ward/ICU) rotation, please estimate the number of patients whom you believe experienced a minor harm as a result of a problematic handovers. (Minor harm - Limited clinical consequence—such as a need for more frequent monitoring or transient discomfort; may lead to prolonged hospitalization but without significant organ dysfunction or worsening of clinical condition.) (Response categories: none, 1-5, 5-10, more than 10 patients.)

8. In your most recently completed Inpatient (ward/ICU) rotation, please estimate the number of patients whom you believe experienced a major harm as a result of a problematic handovers. (Major harm - Significant clinical consequences such as deterioration in clinical status, organ dysfunction, prolonged hospitalization, disability beyond discharge, or death.) (Response categories: none, 1-5, 5-10, more than 10 patients.)

Declaration

I declare this thesis is entitled "**Knowledge, attitude and practice of residents towards patient handover during transitions of care of admitted patients in Tikur Anbessa specialized hospital**" is my own original work for the partial fulfillment of specialization in Internal Medicine and that it has been presented for AAU, department of Internal Medicine.

Principal Investigator

Name:_Eyosias Lemma Teshome, MD, (3^{rd} Year internal Medicine resident)

Date:_____

Signature:_____

Advisor

Name: Aschalew Worku, MD (Consultant internist, pulmonary and critical car Medicine)

Date:_____

Signature:_____

Department head

Name: Dr. Abdurezak Ahmed (Consultant internist and endocrinologist)

Date:_____

Signature:_____