

ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCES
DEPARTMENT OF EMERGENCY MEDICINE



**PAIN TREATMENT PRACTICE AND ITS IMPACT ON PATIENT SATISFACTION
IN EMERGENCY DEPARTMENT: EXPERIENCE FROM TIKUR ANBESSA
SPECIALIZED HOSPITAL, ETHIOPIA, 2019.**

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Addis Ababa, Ethiopia

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Declaration

I, Demmelash, declare that this is my original work and all sources of materials used for this thesis are properly acknowledged.

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Acronyms

AAU – Addis Ababa University

ANOVA – Analysis of Variance

CI - Confidence Interval

CHS – College of Health Sciences

ED – Emergency Department

IASP – International Association for Study of Pain

NRS – Numeric Rating Scale

NSAID – Nonsteroidal Anti-Inflammatory Drugs

OR – Odds Ratio

PEMI – Pain and Emergency Medicine Initiative

SD – Standard Deviation

TASH – Tikur Anbessa Specialized Hospital

TEWS - Triage Early Warning Score

WHO - World Health Organization

List of Tables and Figures

Table 1.0 - Mode of Referral Versus Pre-ED Analgesics, Cross tabulation, TASH, July 15-19, 2019, Addis Ababa, Ethiopia.

Fig. 1.0 - CONSORT Diagram of Patient allocation through the study, TASH, July 15-19, 2019, Addis Ababa, Ethiopia.

Table 2.0 - Demographic and Clinical Characteristics of patients Versus Desire for Analgesics, TASH, July 15-19, 2019, Addis Ababa, Ethiopia.

Fig. 2.0 - Mode of Referral Versus Pre-ED Analgesics Treatment at TASH, July 15-19, 2019, Addis Ababa, Ethiopia.

Table 3.0 - Mann-Whitney test for initial and repeat NRS, Association with Analgesics intake, TASH, July 15-19, 2019, Addis Ababa, Ethiopia.

Fig.3.0 Patient's subjective feeling after analgesics administration in the ED, TASH, July 15-19, 2019, Addis Ababa, Ethiopia

Table 4.0. Factors Associated with Physician Analgesics Prescription, TASH, July 15-19, 2019, Addis Ababa, Ethiopia.

Fig.4.0 Patient Satisfaction with pain treatment in the ED, TASH, July 15-19, 2019, Addis Ababa, Ethiopia

Table 5.0 Predictors of Overall Satisfaction with Pain Treatment in ED, TASH, July 15-19, 2019, Addis Ababa, Ethiopia.

Table of Contents

ACKNOWLEDGMENT.....	3
Acronyms.....	4
List of Tables and Figures.....	5
Table of Contents.....	6
Abstract.....	8
1. Introduction.....	9
1.1 Background.....	9
1.2 Statement of the Problem.....	10
1.3 Significance of the Study.....	11
1.4 Literature Review.....	11
2. Objectives of the Study.....	13
2.1 General Objectives.....	13
2.2 Specific Objectives.....	13
3. Methodology.....	13
3.1 Study Setting.....	13
3.2 Study Design.....	13
3.3 Study Population.....	13
3.4 Source Population.....	13
3.5 Sampling Unit.....	13
3.6 Study Unit.....	13
3.7 Inclusion Criteria.....	14
3.8 Exclusion Criteria.....	14
3.9 Variables.....	14
Independent Variables:.....	14
Dependent Variables:.....	14
3.10 Sampling.....	14
3.10.1 Sample Size Determination.....	14
3.10.2 Sampling Procedure.....	14
3.11 Method of Data Collection.....	14
3.12 Measurements.....	15
3.13 Operational Definition.....	15
3.14 Data Quality Assurance.....	16
3.15 Data Analysis and Interpretation.....	16
3.16 Ethical Considerations.....	16
3.17 Dissemination of Results.....	17

4.0	Results.....	18
5.	Discussion.....	28
6.	Limitation of The Study.....	30
7.	Recommendations.....	30
	References.....	31
	Annex 1.0 – Triage Early Warning Score (TEWS)	33
	Annex 2.0 Format of Verbal Consent Used.....	34
	Annex 3.0 Questionnaire	35

Abstract

Background: Undertreatment of pain is common in emergency department. The major reasons are lack of staff training in recognition, measurement and adequate pain treatment. Despite the global attention being given over the years, undertreatment of pain in the clinical practice is still an issue.

Objective: The general objective of this study is to assess the pain treatment practice and its impact on patient satisfaction in the emergency department of Tikur Anbessa Specialized Hospital, July 15-19, 2019 Addis Ababa Ethiopia.

Methodology: Single centered, prospective, observational study for a continuous 24 hours of 5 days was conducted on total of 106 patients with history of recent pain. Numeric Rating Scale was used to assess patient's severity of pain. Each patient was evaluated twice, initially at triage and 2-4 hours after arrival. The desire for analgesics was assessed at triage and Patient's level of satisfaction was also assessed during the second evaluation. Data was analysed with SPSS version 21

Results:

Out of 106 patients male account for 57.5% with M:F ratio of 1.3. The mean age of participants was 42.53years, with SD =16.3 years. The majority of patients were having medial emergency followed by oncologic emergency and trauma. The mean initial numeric rating scale was 5.88 (SD=2.09) measured out of 10. The proportion of patients who did not receive analgesics prior to emergency department were 77.4% (n=82), despite the fact that 57.5% (n=61) of them were referred by primary care taker. Desire for analgesics was found to be significantly associated with initial numeric rating scale. Despite the fact that 80.2% (n=85) of the patients desired analgesia, it was prescribed only for 51%(n=54) patients and actually taken by only 41.5%(n=44). Asking for analgesics and patient presentation during day time were significantly associated ($p<0.05$) with physician analgesics prescription.

The overall satisfaction with pain treatment was reported in 68.87% (n=73) patients, despite the presence of undertreatment in 54% (n=52). Coming at day time and lower repeat numeric repeat scale has statistically significant association with over all emergency department in pain treatment satisfaction.

Conclusion: There was a significant undertreatment of pain in the emergency department of Tikur Anbessa Specialized Hospital. Under recognition of pain by physicians and decision not to prescribe was the major reason patients didn't take analgesics. Despite that, patient satisfaction was good and repeat mean numeric rating scale was also decreased.

Key words: TASH, Numeric Rating Scale, Emergency Department, Pain Treatment, Pain satisfaction

1. Introduction

1.1 Background

Pain is a natural protective mechanism of the body that signals the presence of danger. It is often the result of tissue damage in the body. Because of pain we withdraw our body from a noxious stimulus.(1) In that way it is inevitable. The International Association for the Study of Pain defined pain (IASP) in 1979 as follows. It is “*An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.*” Different people tried to modify this definition over the years, but it still stands today.(2) As much as it is unpleasant, it is also vital for survival as it alerts us when something is wrong. It can be caused by a disease process, its consequences, concomitant problems or treatment complications.(3) There are two major types of pain: fast pain and slow pain. Fast pain is felt within 0.1 second of noxious stimulus, while slow pain begins after 1 second or more and slowly increases in intensity over seconds or minutes. Fast pain is alternatively described as pricking pain, electric pain, sharp pain and acute pain. This type of pain is felt when skin is acutely burned, cut with knife or prick with needle. Electrical shock also causes acute pain. It is mainly felt superficially, not in most deeper tissues. It often accompanied by sympathetic overactivity and anxiety. On the other hand, slow pain, is alternatively called slow burning pain, throbbing pain, aching pain, and chronic pain. It is mainly associated with tissue damage; occurs both in the skin and deep tissue. It is mainly associated with suffering, and depression with no protective benefits.(1) Pain can also be classified based on underlying mechanism or situation. Based on the mechanism, there are nociceptive and neuropathic type of pain. Nociceptive pain is the result of specific sensory receptor stimulation in somatic structures and viscera. Somatic pain is mucocutaneous, often well localized and sharp. On the contrary, visceral pain is dull with poor localization. It may be referred to the skin based on dermatome representation. It is also associated with autonomic responses like nausea and sweating. Neuropathic pain is a direct result of damage to the peripheral or central nervous system. It is characterized by burning pain, aching sensation relieved by pressure applied to affected area, shooting pain, and increased sensitivity to pain stimulus. Pain can also be classified based on the situation it is felt. It can be a transient exacerbation of chronically controlled pain, known as breakthrough pain. Incidental pain, when it occurs in specific circumstances like after movement of specific part of the body. It can also follow intervention, known as procedural pain.(3)

As it is the manifestation of something wrong in the body, pain is the major cause of patient visits to the emergency department. Pain has no predilection to gender, ethnicity or age. It affects everyone equally.(4) Identification and treatment of pain in the practice of medicine has long been a priority since the time of Hippocrates. One of the best descriptions of role of medicine comes from the 15th century French folk, ‘the role of physician is to cure sometimes, to relieve often and to comfort always’.(5)

Attention to recognition and treatment of pain is also given in modern medicine practice. The International Association for the Study of Pain was established in 1975, and still functions by developing guidelines and classification of pain. In 1995, Dr. James Campbell suggested the ideal of pain as 5th vital sign on his Presidential speech to the American Pain Society forum. The applicability of these idea in clinical practice was found to be challenging because of health care professional’s lack of training on evaluation, examination and management of patient’s pain.(6) Joint Commission for Standard of pain was founded in 1997. In 2001, the first ever

standard of pain treatment was introduced by the joint commission. (7) The congress declared a 10-year period beginning in 2001 as ‘decade of pain’. This is to show the attention given to the importance of pain management.

On September 3, 2010, IASP representatives from chapters in 64 countries plus members in 129 countries, gave attention to the unrelieved pain in the world developed the declaration of Montreal, which considered access to pain management as a fundamental human right. Pain management inadequacy in most of the world was acknowledged. Inadequate access to treatment of acute pain from trauma, disease and terminal illness was identified. Major deficits in knowledge of health care professionals regarding mechanism and management of pain, stigmatization of chronic pain without diagnosis, and restriction on availability of opioids critical to management of pain was recognized. The WHO estimates that 5 billion people live in countries with inadequate access to treatment of moderate to severe pain.(8)

Given the global concern in the assessment and management of pain, our interest in investigating the current practice of pain management and its impact on patient satisfaction in TASH, ED is understandable. Understanding the current practice and its implication in patient satisfaction will help us to notice the gaps and improve future patient care.

1.2 Statement of the Problem

Pain is the most common reason for patient ED presentation accounting for 60-80% of cases.(9,10) Patients could come seeking help for acute pain or exacerbation of chronically controlled pain. The pain could be part of the disease process, treatment complication or result of comorbid disease process. The basic principles of pain treatment are patient assessment to recognize those in pain, pain measurement to clearly document its intensity and adequate pain management. The numerical Rating Scale is one of the accepted pain measurement tools in adults. The health professionals ask the patient to rate his pain from 0 to 10. Zero for ‘No Pain’ and 10 for ‘Worst Pain Imaginable’ (3) Inability of treating team to follow those principles will lead to undertreatment of pain and patient suffering. Review of publications identified causes of poor pain management in the ED: Failure to recognize and acknowledge pain, inadequate initial pain assessment, lack of proper documentation of pain status, inability to meet patients’ expectation. There are also biases related to pain treatment based on age, gender, ethnicity and opioid use.(11) There is undertreatment of pain in the emergency room, even when patients clearly desire analgesics. Use of inappropriate drug, wrong route and dose of administration and delayed administration of analgesics are common problems in the ED.(12),(13) Common reasons for undertreatment of pain in the ED are found to be limitations in pain assessment, the risk of dose-related NSAIDS side effects, and fear of addiction and respiratory depression in opioids administration.(14) Barriers in proper pain management in ED includes, lack of trained staff for pain management, lack of clinical quality improvement tools for pain, lack of well-studied recommendations for pain treatment in special groups like the elderly, and physicians attitude on opioid related addiction and safety.(15) The reality in Tikur Anbessa Specialized Hospital may not be different from these due to absence of pain clinic, unavailability of opioids and overcrowding of the emergency department with oncology patients. Undertreatment of pain has multiple consequences on the patient and the health care facility. It is directly related to patient satisfaction, length of stay and risk of developing chronic pain.(16),(17),(18).

1.3 Significance of the Study

Given the global undertreatment of pain, it is easy to assume it would be similar in our set up. There is no standardized protocol for pain treatment in the ED of TASH. Inconsistency and undertreatment of pain are expected in set ups with no standardized protocol. In an attempt to study pain treatment practice in ED of TASH, *Getaw et al.* in 2014 stated 66% patients presented to ED with moderate to severe pain (mean NRS of 7.7), only 36.7% of patients showed improvement. The study also reported 72% patient satisfaction of pain treatment despite the presence of clear oligoanalgesia.(19)

The need to study the current status of pain treatment practice in the ED of TASH and its impact on patient satisfaction was required five years after the baseline study. The output of this paper will also help us to identify recent trends in patient type and gap in treatment of pain. It will also help us to derive important recommendations based on the study output, tailored to improve patient suffering.

1.4 Literature Review

Pain is the most common presenting symptom to the emergency room, accounting for 60-80% of ED visits(9).

Wilson et. al presented the first ever study on undertreatment of pain in emergency department in 1989. They reviewed 198 patient charts who were admitted through emergency room. Undertreatment of pain in the ED was found to be a common problem in the study. Fifty six percent of patients didn't get any form of analgesia while in the ED, out of 44% who received analgesics in ED there was 1-hour delay in 69%, and 42% had two-hour delay. A one-week retrospective cross-sectional study done by Johnson et.al was published in 2005. Out of 1665 consecutive ED visits, 61.2% had documented pain. 52.2% of them had pain as a chief complaint.(9)

Review of literature on barrier to pain management shows physician perception of therapy with analgesics and lack of training in recognition of inadequate pain and available treatment choices contributes of undermanagement of pain. Opioid related adverse effects also contribute to inadequate pain treatment.(18)

A 10-year retrospective study by Albrecht et.al on undertreatment of acute pain in adult trauma patients, reported 43% oligoanalgesia. Physician practice variation was found to be one of the contributors for undertreatment of pain. (20)

Undertreatment of pain leads to patient suffering and other related complications. Unrelieved pain results in impaired sleep, reduced quality of life, impaired physical function, and high economic cost because of post op hospital readmission. Physiologic consequences of unrelieved acute pain include high risk of progression to chronic pain. (18)

A prospective multicentric study on 572 patients showed no pain relief in 37% of patients, despite analgesics prescription. (21)

Under prescription of analgesics is also one of the major causes for undertreatment of pain. Factors that affect physicians' decision to prescribe opioids in ED are multidimensional. Open-ended, semi-structured qualitative interview with 52 physicians grouped possible reasons affecting physician decision to prescribe opioids into 3 domains. The first is provider assessment of pain characteristics (Acuity, Diagnosis, and perception of pain severity), second

domain consists of patient-based considerations (trustworthiness, and risk of misuse). Having multiple visits, being from out of town, and a clinical history that doesn't add up leads to suspicion on possibility of opioid misuse. The third consideration is health system, policy and practice related. Patient satisfaction scores directly results in more opioid prescription for fear of hospital administrations hustle due to decreased patient satisfaction scores. (22)

There are contradicting studies regarding the level of pain control and patient satisfaction. On one hand, proper pain management is related to improvement in patient satisfaction in the ED. Reduction in perceived level of pain directly increases distress relief, increases patient to physician report and adherence to given advices.(23) Another 10-day prospective observational study on 334 patients showed that patients receiving analgesics in ED has higher satisfaction score than patients not receiving analgesics. Patients that took analgesics had also greater decrease in pain score than those who did not take them. (17)

On the other hand, some studies show no association between pain intensity score and patient satisfaction. Satisfaction assessment survey on 88 patients, after opioid administration revealed there is no association between pain intensity score and patient satisfaction.(24)

Patients' desire for analgesics at the time of ED presentation should also be assessed to optimal pain treatment. In a prospective study by Judith Zanden et. al, 43.7% patients desired analgesics at the time of presentation. Initial pain score was the only predictor of desire for analgesics, NRS for desiring (7.01), while in patients not desiring (5.14). Questioning pain score and desire for analgesics helps to decrease inadequate pain management. (17)

Another observational prospective study on 393 patients showed, 51.4% desire for analgesics. The major reason for refusal of analgesics was desire to know diagnosis, bearable pain, pre-ED analgesics and fear of adverse effects. Pain severity was also again related to desire for analgesics. (NRS 7.1 in desiring, 5.7 in not desiring). Patients who desired analgesia were significantly younger than those who do not desire. Satisfaction was significantly higher among patients who wanted and received analgesics, compared with the ones desiring without receiving. (25)

Another prospective observational study by Adam et, al. determined the relationship between triage pain score and desire for analgesics. They enrolled 392 patients out of which 51% desired for analgesics. Pain scores were higher in those who desired analgesics than those who do not want them. whereas pain score and desiring analgesics were significant predictors of receiving analgesics. (26)

Delays in ED pain medication administration and increased errors are associated with increased crowding. (27) Rapid time to analgesia was associated to shorter ED length of stay. ED-length of stay is shortened by 2 hours when delay to receive analgesics is <90min.(28)

The pain and Emergency Medicine Initiative (PEMI) conducted, A multicentred prospective study on 20 US and Canadian hospitals enrolled 842 patients. In this study only 32% patients presented with pain results from injury. Although 70% of the patients desired analgesics, only 60% of them received them.

2. Objectives of the Study

2.1 General Objectives

To assess the Pain treatment practice and its impact on patient satisfaction in ED of TASH, from July 15-19,2019, Addis Ababa, Ethiopia.

2.2 Specific Objectives

- To assess satisfaction of patients in pain treatment at the emergency department
- To assess the change in patient numeric rating scale of pain.
- To know factors affecting the patient's desire to take analgesics.
- To analyse the effect of pain treatment on patient length of stay in ED

3. Methodology

3.1 Study Setting

This study was conducted in ED of Tikur Anbessa Specialized Hospital. TASH is a tertiary level hospital with speciality and subspecialty centred service. It gives service to patients coming from all parts of Ethiopia. The hospital has emergency, outpatient, and inpatient services. The emergency room works 24 hours per day throughout the year. The emergency room receives patients who came directly from the community, referral from public and private hospitals, and patients from outpatient referral clinics of the hospital. The ED has triage area, front, red, orange, and yellow/green division units. Sorting of patients based on severity and urgency is done at triage. At the front area physician evaluation will be done for patients with orange and yellow/green triage score. While patients requiring immediate resuscitation are seen at the red room.

3.2 Study Design

It was a single centred, prospective, observational study on patients above the age of 18 presented to TASH ED with complaint of recent pain (< 3 months).

3.3 Study Population

Total patients who visited the ED of TASH during the study period, who had pain.

3.4 Source Population

All patients who visited the ED of TASH adult emergency during the study period.

3.5 Sampling Unit

Individual patient encountered.

3.6 Study Unit

Individual patient sampled.

3.7 Inclusion Criteria

- Age \geq 18 years
- Patients with NRS Pain score 1-10

3.8 Exclusion Criteria

- Patient who left the ED before second assessment
- Patient not giving consent to participate
- Patients in life threatening condition who needed urgent resuscitation
- Patients with altered mental status and neuropsychiatric conditions

3.9 Variables

Independent Variables: Age, Sex, time of ED presentation (day time, night time), pre-ED analgesics intake, location of pain, duration of pain, wish to take analgesics, initial NRS pain score at triage, TEWS, Triage colour code, presence of underlying chronic illness, Patient asking for analgesics with direct communication to staff in ED, Patient actually taking the analgesics

Dependent Variables: Analgesics prescription by physician, repeat NRS pain score, patient satisfaction level, length of stay in ED

3.10 Sampling

3.10.1 Sample Size Determination

Take all convenience sampling technique was used. All patients who came to the emergency department with pain during the study period were enrolled.

3.10.2 Sampling Procedure

All patients who visited the ED during the 5 days study period passed through an initial screening test to check for their eligibility. Patients under the age of 18, patients with NRS pain score 0, patients with altered mental status and neuropsychiatric conditions, patients in immediately life-threatening situation that needed urgent resuscitation and dead body on arrival were ineligible for this study.

3.11 Method of Data Collection

Data was collected 24 continuous hours for total of 5 days. The principal investigator took the role of training a nurse and an intern on data collection tailored for this study. The training lasted for two days during the piloting process. It was focused on how to fill the questionnaire and how to get the informed consent. Piloting of the questionnaire was done on 12 patients, 2 days prior to the actual data collection. After piloting method of knowing exact length of stay was developed. The treating team informed data collectors when patient get disposed, so that site of disposition and length of stay will be documented.

Each patient was assessed twice, initially at triage and 2-4 hours after arrival to the ED. Data collection was done using a four-part structured questionnaire which was coded with numbers known to the data collectors only. It had a total of 28 questions. The first part assessed demographic characteristics of patients. The second part was used to assess the pre-ED analgesics treatment and initial assessment of the patient pain at triage. The third part assessed

patient's condition 2-4 hours after arrival to the ED. Final part assessed length of stay in ED and site of disposition.

3.12 Measurements

Duration of pain until presentation and patient length of stay in ED was described in days. Those who came in less than a day were assessed in fraction.

Patients were asked to self-rate pain severity out of 10 based on the numeric rating scale. The scale was from 0 to 10. Those patients with 0 pain did not qualify to get enrolled in the study. Patients with NRS 1-3 had mild pain, 4-7 had moderate pain and ≥ 7 for severe pain.

Patients were offered for analgesics at triage. Those who refused were asked for their reason. Repeat NRS on second evaluation was done with the same scale. Subjective perception of the patient about his status was reported as improved, the same and worse compared to his initial status. Patients asking analgesics from the treatment team with direct communication during their stay in the ED was also documented. Physicians order for analgesics was checked from the patient record.

Patient satisfaction was measured out of 5 scale. (1-highly unsatisfied, 2- unsatisfied, 3-somewhat satisfied, 4-satisfied and 5-highly satisfied). For the purpose of analysis satisfaction was categorized in unsatisfied and satisfied categories.

Commonly used pharmacological analgesics were used as therapy options. Paracetamol, weak opioids, strong opioids. Amitriptyline for back pain and nitroglycerin for chest pain were included.

3.13 Operational Definition

Mode of Referral/Source of Referral – it means how the patient came to the ED.

Self-referral - means when a patient directly comes to the ED seeking help, to use the ED as a primary care site, without prior contact to other health care institutions.

Referral by primary health care professional – when the patient is sent to the ED for additional and better acute care treatment after evaluation by other health care professional.

Payment Method – the way of health care expense coverage for patients coming to emergency room. For the purpose of this study, free means the hospital covers the health care expenses of the patient as long as the laboratory and medications are available in the hospital. Payer means the patient covers any expense related to medical care including for analgesics.

Pre-ED analgesics intake – it means when the patient takes analgesics within the past 12 hours of ED presentation. The time is set based on the serum half-life of the commonly used analgesics in practice.

Desire for Analgesics - when patient says 'yes' to data collector's offer of analgesics, during initial evaluation at triage.

No Desire for Analgesics – when patient says 'No' to data collector's offer for analgesics for several reasons.

Triage Early Warning Score – Colour coded and numeric method of sorting out the urgency of patient care need, currently working accepted protocol in the ED.

Category of Illness – denotes the category of emergency for current presentation to the ED. It includes medical emergencies, surgical emergencies, trauma, and oncologic emergencies

Oncologic emergencies – disease or treatment related complications of malignancy including hematologic malignancies.

Analgesics Not Prescribed – When the order to give analgesics is not documented on patient chart by the physician who evaluated.

Patient Asking for analgesics – when patient directly asks the ED health care team for analgesics administration in need of relief for pain.

Analgesics Not Given – when prescribed analgesics is not actually administered to the patient because of various reasons.

3.14 Data Quality Assurance

Supervision by the principal investigator was done during day time data collection. At night time an intern and a nurse worked together to make sure no patient is missed without justifiable reasons. (i.e. screening criteria). Data was filtered, and checked for missing values by principal investigator. It was done twice per day. Data collected during day time was filtered at night, while data collected overnight was checked in the morning. Missed values of analgesics prescription status were corrected looking at patient record. Confirmation of length of stay and disposition site was done by cross checking in to admission registry document.

3.15 Data Analysis and Interpretation

Categorical data were presented as percentages and frequencies of occurrence. Association between categorical variables were checked with chi-square test. Continuous variables are described as means and standard deviations. Univariately associated variables are subjected for multivariate analysis.

Association between two value categorical variable and continuous variable was tested using independent sample t-test. Degree of association was calculated using binary logistic regression, with statistically significant cut off ($p < 0.05$).

Association between more than two value categorical variable and continuous variable was tested with ANOVA with post-hoc analysis.

Association between two continuous variables were checked by Pearson correlation. Linear regression was calculated to determine the degree of association. Statistically significant association is indicated by $p < 0.05$.

SPSS version 21 was used for data entry and analysis. Microsoft excel was used for tabulation and graphs.

3.16 Ethical Considerations

This study was allowed by the department research committee and the department of Emergency Medicine, AAU. During the data collection, patient privacy and confidentiality was assured by coding the questionnaires. Witnessed verbal consent was taken from study participants at the time of presentation. No incentive was privileged for study participants as a direct result of being enrolled in the study. There was no coercion of any kind for participants to take part in this study. They also were granted complete choice to stop their enrolment at

any time during the study. Some patients who were in severe pain expressed need for analgesics only to the data collectors, but not to the treating team. At that time data collectors were forced to tell treating team for analgesics to be given for ethical reasons.

3.17 Dissemination of Results

A copy of this paper will be submitted to the Department of Emergency Medicine, College of Health Sciences, AAU as a thesis paper to the partial completion of residency program. Paper will also be sent to local and international journals for publication. Poster and oral presentations will be made on regional and international conferences on related topic.

4.0 Results

The total number of patients that visited ED of TASH during the 5 days study period was 249. Each of them was screened for study inclusion at the time of their presentation, and 74 were ineligible for inclusion. Total of 175 patients were eligible for this study, out of which total of 69 patients were excluded by exclusion criteria. 106 patients were enrolled in this study. (fig.1.0).

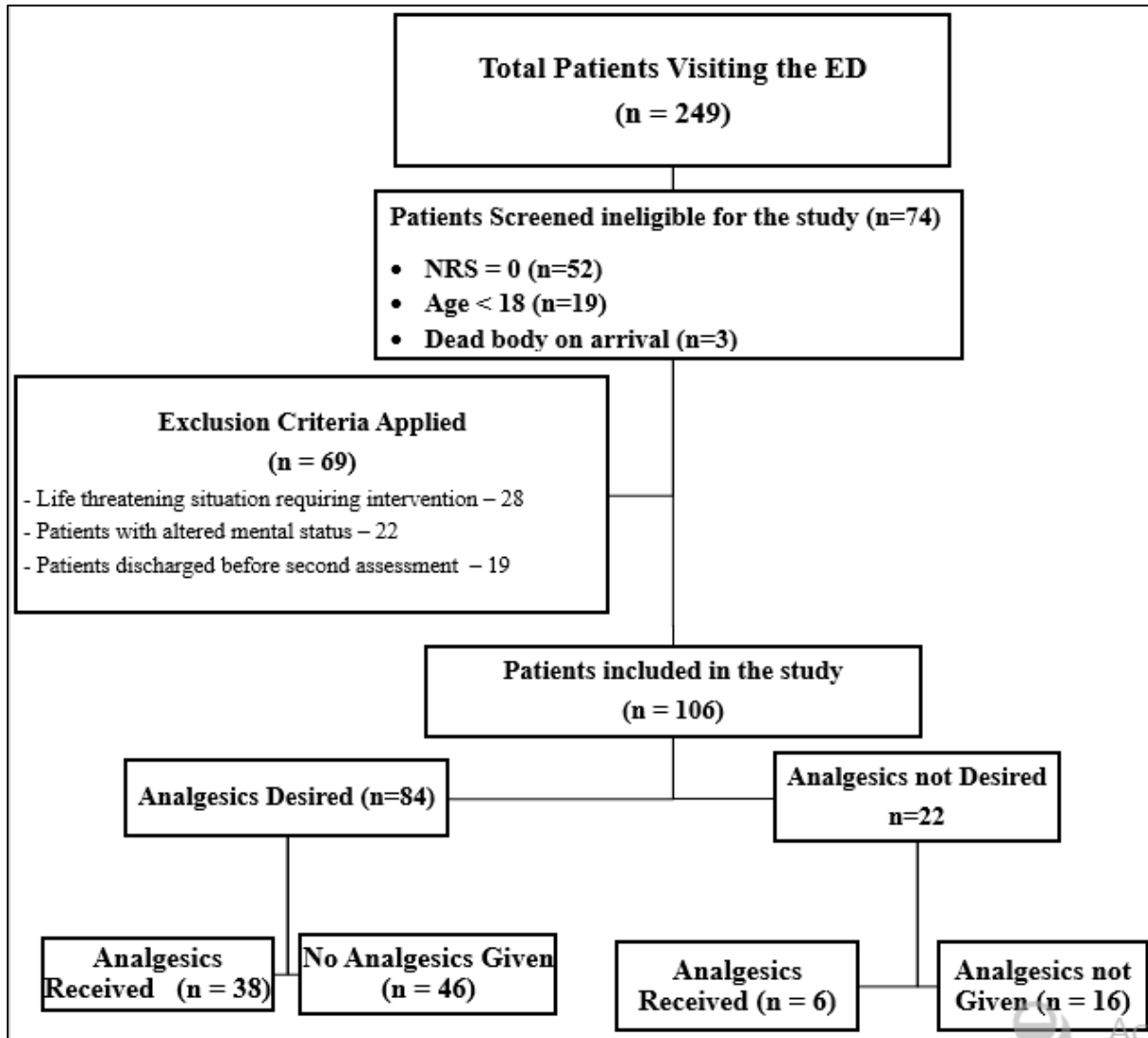


Fig.1.0 CONSORT Diagram of Patient allocation through the study, TASH, July 15-19, 2019, Addis Ababa, Ethiopia.

Characteristics of Study Subjects

The total number of patients eligible for this study were 106. Majority 57.5% (n=61) were male with M:F ratio of 1.3. The mean age was 42.53 years (SD of 16.3). Majority of the patients were seen during day working time accounting for 69.8% (n=74), while the rest come at night. Most 67.9% (n=72) patients paid out of pocket for medications. Most 57.5% (n=61) patients were referred by primary care taker, while the rest were self-referral.

The mean triage early warning system score was 3.1 (SD=1.54). Most patients were triaged Yellow/Green 84%(n=89) followed by Orange, and Red.

Out of 106, 64% (n=68) had underlying chronic illness. Malignancy is the commonest (n=36), followed by other chronic medical conditions.

The commonest category of illness for current presentation to ED was medical emergencies 35.8%(n=38), followed by oncologic emergency 31.1%(n=33), and trauma 19.8%(n=21). (13.2%).

Pain Characteristics

The mean duration of pain prior to presentation to ED, in study participants was 4.9 days (SD= 5.63). The overall mean initial pain score at triage was 5.88 NRS (SD=2.09).

The majority of patients 66%(n=70) had moderate pain (NRS 4-7) during initial evaluation, followed by severe pain (NRS >7) accounting for 18.9%(n=20) and mild pain (NRS<4) in 15.4% (n=16) patients.

The commonest site of pain reported was chest 24.5%(n=26), followed by abdomen and lower extremities. Back pain contributed only to 2.8% (n=3) cases.

Most 77.4%(n=82) did not take analgesics prior to presentation to ED, despite the fact that 57.5%(n=61) of them was referred to the ED by primary care taker (Fig2.0).

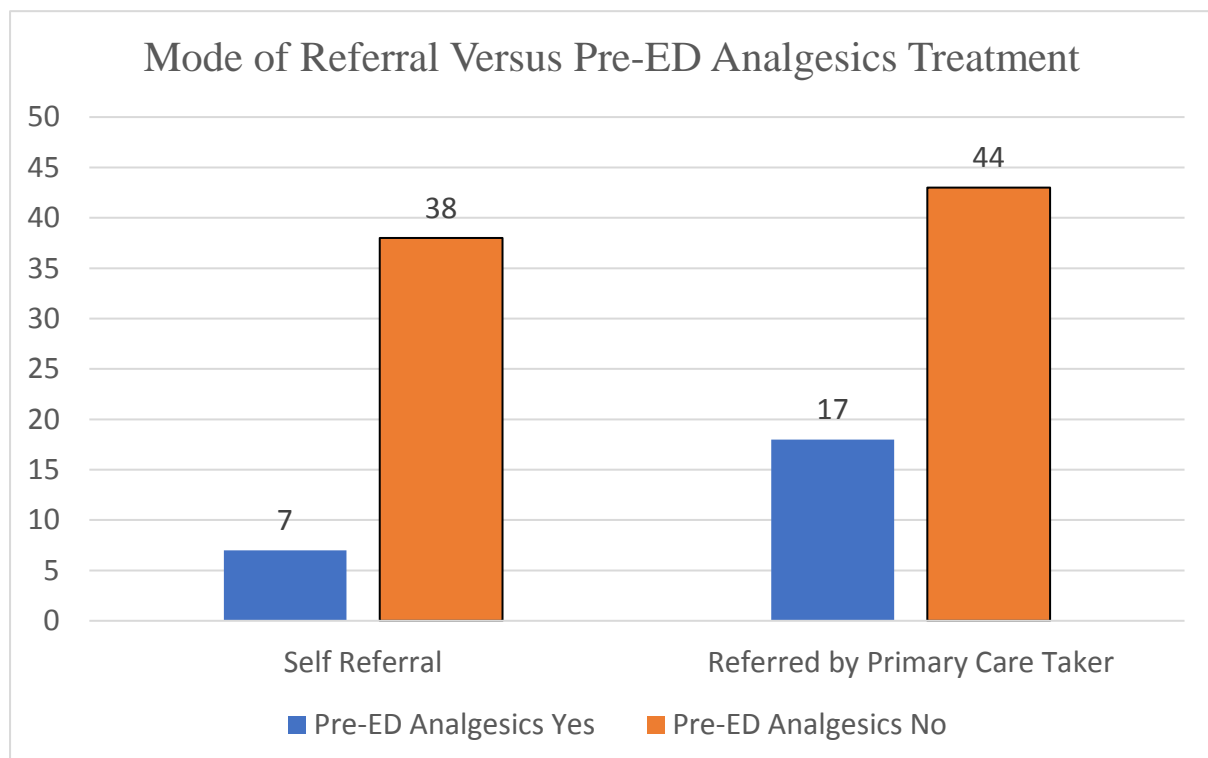


Fig.2.0 Mode of Referral Versus Pre-ED Analgesics Treatment at TASH, July 15-19, 2019, Addis Ababa, Ethiopia.

There was no association between patient mode of referral and pre-ED analgesics intake, on chi-square ($p=0.134$). (Table 1.0)

Table 1.0 Mode of Referral Versus Pre-ED Analgesics, Cross tabulation, TASH, July 15-19, 2019, Addis Ababa, Ethiopia.

		Pre-ED Analgesics		Chi-square	P-Value
		No	Yes		
Mode of Referral	Self Referral	38	7	2	0.134
	Referred by primry care taker	44	17		
Total		82	24		

Tramadol ($n=11$) was the most common analgesics taken by patients prior coming to the ED, followed by diclofenac, and morphine.

Out of 106 enrolled patients, 80.2% ($n=85$) patients desired analgesics during initial evaluation at triage. Patients with higher initial NRS pain score are seen to desire analgesics more than patients with low initial NSR pain score ($p<0.001$). The desire for analgesics did not show association with factors like age, sex, source of referral, pre-ED analgesics intake, category of illness, location of pain, presence of underlying chronic illness, time of presentation or triage colour code. NRS pain score at triage and duration of pain were univariately showed to have difference between the two groups (analgesics desired and analgesics not desired). Those two factors were eligible for multivariate analysis. In multivariate analysis, both NRS pain score at triage and duration of pain were found to be independently associated with desire for analgesics. (Table 2.0). In binary logistics regression, initial NRS is a statistically significant predictor of desire to take analgesics. [Chi-square=18.23, $df=1$ and $p=0.001(<0.05)$]. The odds ratio (OR) for initial NRS score is $OR = 0.62$ (95% CI: 0.47-0.81). Binary logistic regression shows the degree of association between duration of pain and desire to take analgesic was not statistically significant. ($p=0.175$).

Table 2.0 Demographic and Clinical Characteristics of patients Versus Desire for Analgesics, TASH, July 15-19, 2019, Addis Ababa, Ethiopia.

Patient Demographic and Clinical Characteristics	Desire to take Analgesics		Univariate Analysis	Multivariate Analysis
	Yes	No	p-value	p - value
Gender			<i>0.43</i>	
Male (<i>n</i> = 61)	50	11		
Female (<i>n</i> = 45)	34	11		
Mean Age in Years (SD)	41.84(15.52)	45.05(19.22)	0.644	
Mean Duration of Pain (SD)	4.33(4.98)	7.12(7.34)	0.037	0.037
Time of Presentation			<i>0.74</i>	
Day Time (<i>n</i> = 74)	58	16		
Nighth Time (<i>n</i> = 32)	26	6		
Triage Color Code			<i>0.67</i>	
Red (<i>n</i> = 3)	3	0		
Orange (<i>n</i> = 14)	11	3		
Yellow/Green (<i>n</i> = 89)	70	19		
Source of Referral to ED			<i>0.43</i>	
Self (<i>n</i> = 45)	34	11		
Referral by Primary care taker (<i>n</i> = 61)	50	11		
Medical Coverage			<i>0.12</i>	
Free (<i>n</i> = 34)	30	4		
Payer (<i>n</i> = 72)	54	18		
Location of Pain			<i>0.745</i>	
Head and Neck (<i>n</i> = 11)	9	2		
Chest (<i>n</i> = 11)	8	3		
Abdomen (<i>n</i> = 26)	17	8		
Pelvis (<i>n</i> = 10)	8	2		
Upper Extremities (<i>n</i> = 13)	10	3		
Lower Extremities (<i>n</i> = 15)	12	3		
Flank (<i>n</i> = 3)	3	0		
Back (<i>n</i> = 3)	2	1		
NRS Score at Triage			<0.001	<0.001
< 4 Mild Pain (<i>n</i> = 16)	6	9		
4-7 Moderate Pain (<i>n</i> = 70)	60	11		
> 7 Severe Pain (<i>n</i> = 20)	18	2		
Pre-ED Analgesics			0.087	<i>0.579</i>
Yes	20	5		
No	64	17		
Category of Illness			<i>0.71</i>	
Medical Emergencies (<i>n</i> = 38)	29	9		
Surgical Emergencies (<i>n</i> = 14)	10	4		
Trauma (<i>n</i> = 21)	18	3		
Oncologic Emergencies (<i>n</i> = 33)	27	6		

Underlying Chronic Illness

0.72(0.4)

Yes (*n* = 68) Malignancy (*n* = 36)

54, 30

14, 6

No (*n* = 38)

30

8

Patients that did not desire for analgesics during the initial evaluation account for 19.8% (*n*=21). Bearable pain (*n*=13) was the commonest reason. followed by taking analgesics prior to ED presentation (*n*=6), and needs to settle diagnosis rather than symptomatic treatment (*n*=2).

Despite the fact that 80.2% (*n*=85) of the patients desired analgesia, it was prescribed only for 51% (*n*=54) patients and actually taken by only 41.5% (*n*=44) patients. The most common analgesics prescribed in ED was tramadol (*n*=34) followed by morphine and paracetamol.

Out of 58 patients who were not given analgesia in ED, Failure of the physician to prescribe accounted for the majority of cases (*n*=52), followed by nurses not giving the analgesics even when readily available and unavailability of medication in hospital pharmacy.

From the 22 patients who initially refused analgesics, 6 patients received analgesics at the time of second assessment. Out of 84 patients who initially desired analgesics, 46 of them did not receive analgesics.

Taking only 38 patients who desired analgesics and received them, and 16 patients who did not desire analgesics and did not get them, the following sub group analysis is done. Patients who received analgesics in the ED at the time of second assessment had significantly higher initial NRS pain score than those who didn't receive them. $p=0.001$ [NRS score of 6.7 versus 5.3]. Levene's test for equality of variances was significant in independent sample t-test ($p=0.049$), which mandates Mann-Whitney test to be done, and it revealed the mean initial NRS Pain score in those who take analgesics was significantly higher than who didn't take analgesics. ($U=833.5$, $p=0.001$). Repeat NRS pain score measured 2-4 hours after arrival has decreased significantly in patients who received analgesics, with NRS score of 3.68. which is significantly higher than the reduction NRS score in patients who did not take analgesics (NRS=1).

Table 3.0 Mann-Whitney test for initial and repeat NRS, Association with Analgesics intake, TASH, July 15-19, 2019, Addis Ababa, Ethiopia.

NRS pain score	Did Patient take Analgesics	n	Mean NRS	Levene's Test for Equality of Variance		Mann-Whitney U	P
				F	p		
Initial NRS Score	Yes	44	6.73	3.97	0.049	833.5	0.001
	No	62	5.29				
Repeat NRS Score	Yes	44	3.05	9.7	0.002	958.5	0.008
	No	62	4.29				

Predictor Variables of ED Analgesics Prescription by Physicians

The likelihood of physician prescribing analgesics showed association by Chi-square test, with time of day at presentation, Category of Illness and patient asking for analgesics while in ED. Those univariately associated variables were subjected to multivariate analysis. There was independent association with patient asking for analgesics and physician prescribing analgesics. Since Levene's test for equality of variance between groups (prescribed and not prescribed) was significant (<0.05) for time of the day at presentation and category of illness. Those two variables were subjected to Mann-Whitney test. Mann-Whitney revealed both category of illness ($U=996$, $p=0.007$) and time of day at presentation ($U=1123$, $p=0.026$), are independently associated with physician analgesics prescription.

Binary logistic regression shows statistically significant association between patient asking for analgesics ($p<0.001$) $OR=102.43(95\%CI: 21.34-491.69)$, and time of the day at presentation ($p=0.034$), $OR=4.99 (1.13-21.99)$ with physician prescribing analgesics.

Patient Sex, triage colour, source of referral, pain location, payment method, pre-ED analgesics administration, and presence of chronic illness has shown no association with physician prescribing analgesics.

Independent sample t-test showed there is association between triage NRS score and physician prescribing analgesics. While age, duration of pain, and triage TEWS score showed no association with physician prescribing analgesics. The degree of association between initial NRS and physician prescription of analgesics was not statistically significant. [$p=0.557$, $OR=0.912$ with $95\%CI (0.67-1.24)$]

Out of 20 patients with severe pain ($NRS>7$) who deserves strong opioids, only two patients took strong opioids (morphine $n=1$, pethidine $n=1$). 8 of the patients who deserved strong opioid were given only tramadol, the rest 9 patients did not receive any kind of analgesics.

Table 4.0. Factors Associated with Physician Analgesics Prescription, TASH, July 15-19, 2019, Addis Ababa, Ethiopia.

Predictors Physician Analgesics Prescription	Analgesics Prescribed		Univariate Analysis p-Value	Multivariate Analysis p-value
	Yes	No		
Sex			<i>0.716</i>	
Male ($n = 61$)	32	29		
Female ($n = 45$)	22	23		
Mean Age in Years (SD)	44.8(15.67)	40.17(16.77)	<i>0.145</i>	
Mean Duration of Pain (SD)	4.97(5.58)	4.84(5.73)	<i>0.913</i>	
Time of Presentation			<i>0.025</i>	<i><0.001</i>
Day Time ($n = 74$)	43	31		
Nighth Time ($n = 32$)	11	21		
Triage Color Code			<i>0.82</i>	
Red ($n = 3$)	1	2		
Orange ($n = 14$)	7	7		
Yellow/Green ($n = 89$)	46	43		
Source of Referral to ED			<i>0.275</i>	

Self (<i>n</i> = 45)	19	26		
Referral by primary care taker (<i>n</i> =61)	35	26		
Medical Coverage			<i>0.334</i>	
Free (<i>n</i> = 34)	15	19		
Out of Pocket Payment (<i>n</i> = 72)	39	33		
Location of Pain			<i>0.209</i>	
Head and Neck (<i>n</i> = 11)	2	9		
Chest (<i>n</i> = 11)	12	14		
Abdomen (<i>n</i> = 26)	12	13		
Pelvis (<i>n</i> = 10)	5	5		
Upper Extremities (<i>n</i> = 13)	10	3		
Lower Extremities (<i>n</i> = 15)	9	6		
Flank (<i>n</i> = 3)	2	1		
Back (<i>n</i> = 3)	2	1		
NRS Score at Triage			<i>0.005</i>	0.131
< 4 Mild Pain (<i>n</i> = 15)	5	11		
4-7 Moderate Pain (<i>n</i> = 71)	38	32		
> 7 Severe Pain (<i>n</i> = 20)	10	10		
Pre-ED Analgesics			<i>0.563</i>	
Yes 22.6%(<i>n</i> =24)	14	10		
No 77.4%(<i>n</i> =82)	40	42		
Patient Asks for Analgesis			<i><0.001</i>	<i>0.281</i>
Yes (<i>n</i> =52)	47	5		
No (<i>n</i> = 54)	7	47		
Category of Illness			<i>0.004</i>	<i>0.048</i>
Medical Emergencies 35.8%(<i>n</i> = 38)	11	27		
Surgical Emergencies 13.2%(<i>n</i> = 14)	8	6		
Trauma 19.8%(<i>n</i> = 21)	16	5		
Oncologic Emergencies 31.1%(<i>n</i> = 33)	19	14		
Underlying Chronic Illness			<i>0.14(0.786)</i>	
Yes (<i>n</i> = 68) Malignancy (<i>n</i> = 36)	(31, 19)	(37, 17)		
No (<i>n</i> = 38)	23	15		

Effect of Pain Treatment on Satisfaction of Patients

The majority of patients 58.5%(*n*=62) subjectively felt improvement from their initial condition, 35.8%(*n*=38) of patients felt the same, while the rest 5.7%(*n*=6) patients felt worse at the time of second evaluation. The overall repeat mean NRS score is 3.77 with (SD=2.24).

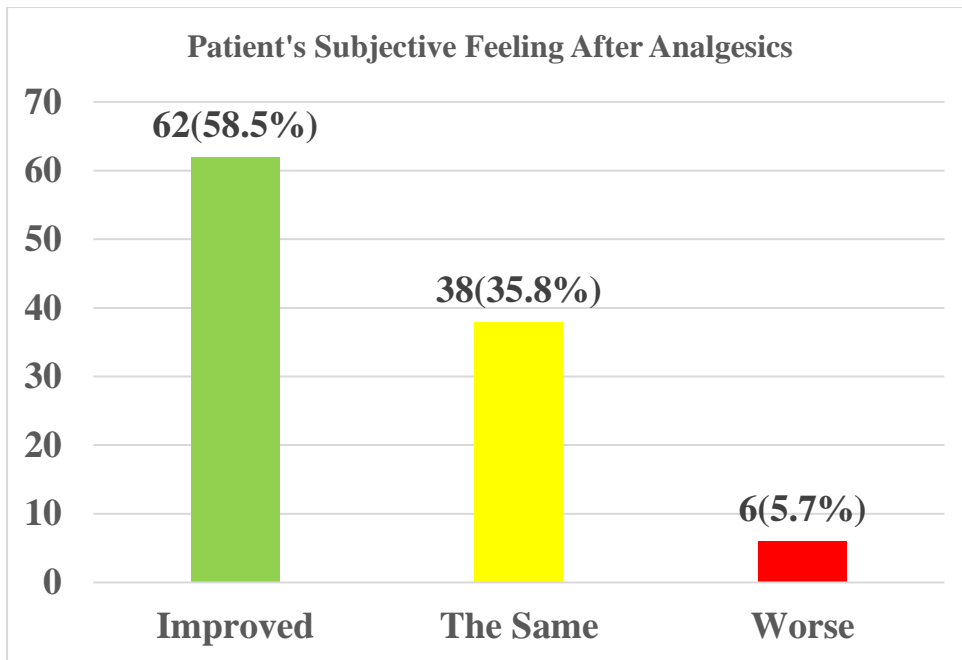


Fig.3.0 Patient's subjective feeling after analgesics administration in the ED, TASH, July 15-19, 2019, Addis Ababa, Ethiopia

The majority 68.87%(n=73) patients reported overall satisfaction with pain management, and 9.43% reported even highly satisfied. Out of 106 patients 31.13% (n=33) reported dissatisfaction with pain treatment, and 13.21% were highly unsatisfied.

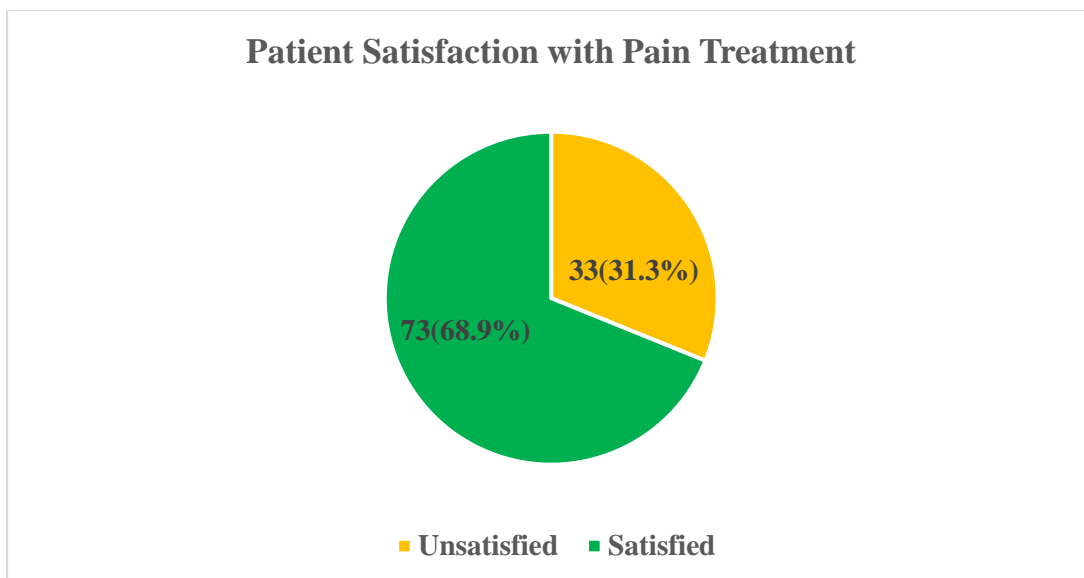


Fig.4.0 Patient Satisfaction with pain treatment in the ED, TASH, July 15-19, 2019, Addis Ababa, Ethiopia

Triage score, initial NRS, duration of pain and age of the patient showed no association with overall ED satisfaction on One-way ANOVA

Factors that were found to be univariately associated with satisfaction by chi-square test (Time of day at presentation, chronic illness, Patient asking for analgesics, Patient actually taking

analgesics, kind of analgesics taken, patient's subjective perception of change in pain, and repeat NRS pain score) were subjected for multivariate analysis.

In multivariate analysis, time of the day at presentation, patient asking for analgesics, patient taking analgesics in ED, Subjective change in pain and repeat NRS were found to be independently associated with patient satisfaction.

Multinomial logistic regression showed coming to the ED at day time [Chi-square = 6.86, df=1, and p=0.016 (<0.05)] with OR:8.09 (95%CI: 1.48-44.2) and lower repeat NRS [Chi-square = 4.4, df=8 and p<0.001(<0.05)] has statistically significant association with overall ED satisfaction. Out of 5 patients who left the ED against medical advice, one patient was highly unsatisfied with the pain treatment (p=0.424).

Table 5.0 Predictors of Overall Satisfaction with Pain Treatment in ED, TASH, July 15-19, 2019, Addis Ababa, Ethiopia.

Predictors of Overall Satisfaction	Association	df	Univariate p - value	Multivariate Analysis p - value
	Chi Square			
Time of the day	19.33	4	< 0.001	< 0.001
Patient Sex	8.1	4	0.88	
Payment Method	3.39	4	0.494	
Mode of Referral	21.02	16	0.178	
Location of Pain	37.32	28	0.112	
Pre-ED Analgesics	6.75	4	0.15	
Wish to take Analgesics	2.08	4	0.722	
Triage Category	6.28	8	0.616	
Chronic Illness	11.12	4	0.024	0.22
Category of Illness	22.74	12	0.03	
Patient Asking for Analgesics who taking Analgesics	12.19	4	0.016	< 0.001
Kind of Analgesics	22.44	4	< 0.001	< 0.001
Subjective Change in pain	44.77	28	0.023	
	35.25	8	< 0.001	< 0.001
	ANOVA			
Triage Score	F = 1.06	1	0.282	
NRS at Triage	F = 1.17	1	0.282	
Repeat NRS	F = 77.97	1	< 0.001	< 0.001
Age of Patient	F = 0.708	4	0.588	
Duration of Pain	F = 1.016	4	0.403	

Effect of Pain Treatment on ED length of Stay

The mean patient length of stay in ED was 2.14 days (SD=2.36). The maximum ED length of stay was 13 days, while the minimum was 4 hours. 49.06% (n=52) were disposed from the ED in ≤ 24 hours.

Out of 106 patients, 50% were discharged home improved, while 39.6% of them got admitted for inpatient treatment and 5.7% were transferred out to other hospital.

Pearson correlation was done between length of stay and continuous variables. It showed association for NRS at triage and TEWS score. On the other hand, Age, duration of pain, repeat NRS, overall satisfaction has no association with ED length of stay.

Linear regression analysis revealed the association between TEWS and ED length of stay. Is statistically significant. [mean *TEWS*=3.1, $p=0.032$], OR= 2.17 at 95% CI (0.027-0.59).

There is also statistically significant association between triage NRS and ED length of stay. [mean *NRS* = 5.88, $p=0.036$] and OR=2.1 at 95% CI (0.016-0.439).

One-way ANOVA showed association between length of stay and mode of referral, triage category, chronic illness, Repeat NRS category.

Binary logistic regression showed statistically significant association between mode of referral and 24 hours ED length of stay with ($p=0.005$), OR=3.3 at 95% CI (1.42-7.66).

5. Discussion

There was a male predominance in this study with M:F ratio of 1.3. Mean age was 42.53 years.

Most patients are seen at day time 69.8%(n=74). Majority 57.5%(n=61) of patients were referred to the ED by primary care taker. Despite that 77.4% (n=82) of patients didn't take analgesics prior to coming to the ED. There was no difference for patients between coming by themselves and being referred by other primary care taker on their pre-ED analgesics status. This shows possibility of undertreatment of pain at referral site as well.

The majority 84% (n=89) of patients are triage yellow/green. In 64% (n=68) of the cases there was underlying chronic illness, malignancy was the commonest chronic illness.

Mean duration of illness before presentation was 4.9days. 2/3rd of patients had moderate pain at presentation. Back pain contributes only to 2.8% of cases, unlike the common assumption that it is common. Medical emergencies were followed by oncologic emergencies and trauma in order. According to the study by *Gelaw et,al* 5 years back trauma was the commonest category of illness in the ED. The number of trauma patients seen is showing decreasing trend.(19)

Tramadol was the most commonly used analgesics taken prior to the ED and in the ED as well, probably because its availability and less adverse effect on the kidney and stomach.

Desire for analgesics

The desire for analgesics was independently associated with initial NRS score. The mean NRS score for patients who desire analgesics and for those who did not desire analgesics was (NRS: 6.3 Vs 4.3) It is consistent with previous other studies as well. The mean NRS score for those patients who desired analgesics and who did not desire analgesics in previous studies was as follows ; *Singer et, al (2008) – 7.5 Vs 6.4 ; Allione et, al (2011) - 7.1 Vs 5.1; Van Zanden et, al (2018) – 7.01 Vs 5.14 .(17)(25)* There was also association with duration of pain and desire for analgesics, even if strength was not statistically significant. Patients who have been in pain longer tend to desire less ED symptomatic pain relief.

Commonest reason for not desiring analgesics was bearable pain followed by taking pre-ED analgesics and need to settle diagnosis.

Despite the fact that 80.2% (n=85) of patients desired analgesics, it was given only to 41.5% (n=44). this shows there is clearly undertreatment of pain in the ED, even while patients clearly need it. The unusually high percentage of desire for analgesics may be due to small number to pre-ED analgesics.

Out of the 62 patients who did not take analgesics in ED, 89.6% (n=56) of them was because analgesics was not prescribed by treating physician. This could be because of lack of training

in recognition and treating of pain or non-pharmacological means of pain treatment affecting physician's decision to order analgesics.

Analgesics was not given to 58.4% of patients. Repeat NRS score significantly decreased in patients who took analgesics compared to those who didn't take.

Predictors of Physician Analgesics Prescription

In this study, coming to the ED at day time and asking for analgesics showed statistically significant association with physician ordering analgesics. This has implication even for predisposition to opioid misuses and addiction. If ever comes a time by which we will get strong opioids readily available, our practice is highly at risk of increased opioid dependence if we order more to those who asked us, rather than rightly recognizing who need them the most by our self. On the other hand, staff response for patient asking analgesics is good. The degree of pain association between initial NRS score and physician analgesics prescription was not statistically significant. Both shows there a problem of pain recognition in the ED. Physicians needed to be asked for analgesics even in patients with high NRS score, to order analgesics. Out of 20 patients with NRS > 7, who deserves strong opioids, only two get them. the rest were undertreated or not treated altogether. Factors that affect physicians' decision to prescribe opioids in ED are multidimensional. Open-ended, semi-structured qualitative interview with 52 physicians grouped possible reasons affecting physician decision to prescribe opioids into 3 domains. The first is provider assessment of pain characteristics (Acuity, Diagnosis, and perception of pain severity), second domain consists of patient-based considerations (trustworthiness, and risk of misuse). Having multiple visits, being from out of town, and a clinical history that doesn't add up leads to suspicion on possibility of opioid misuse. The third consideration is health system, policy and practice related. Patient satisfaction scores directly results in more opioid prescription for fear of hospital administrations hustle due to decreased patient satisfaction scores. (22)

Effect of Pain Treatment on ED pain treatment Satisfaction

Majority 58.5% (n=62) of patients reported subjective improvement in their condition. Over all repeat NRS is also significantly lowered 3.77. Despite the presence of 58.4% oligoanalgesia, 68.7% (n=73) of patients reported overall satisfaction. Overall improvement on mean NRS could be attributed to non-pharmacological methods of pain control. Coming at day time and lower repeat NRS score has statistically significant association with overall ED pain treatment satisfaction. Previous studies have also showed consistent result showing significant association between satisfaction and change in pain score.(16) (17) *Allione et, al (2011)* – reported 80% patient satisfaction, *Gelaw et, al (2014)* – reported 72% patient satisfaction of their pain management. And *Van Zander et, al (2018)* – reported 67.1% satisfaction.

Effect of Pain Treatment on ED Length of Stay

The proportion of patients were disposed form the ED within 24 hours of presentation was 49.06% (n=52). Initial triage NRS and TEWS scores significantly affect ED length of stay. In other studies, it is early initiation of analgesics that showed clinically significant decrement in ED length of stay. *Sokoloff et, al (2014)* – reported length of stay is shortened by 2hrs, when delay to give analgesia is <90min. (28) Those who were referred by primary care taker tend to stay more in the ED compared to those who came by themselves, probably due to their complicated nature of illness.

6. Conclusion

The overall change in pain severity is good during re-evaluation. Numeric rating scale at initial evaluation at triage was 5.88, which decreased to 3.77 during re-evaluation at emergency department.

Mean initial NRS of those who were given analgesics in the emergency department was higher than those who were not given [NRS: 6.7 Vs 5.3] ($U=833.5$, $p < 0.001$)

Majority of patients did not take pre-ED analgesics, even when they had prior physician contact.

Triage NRS pain score is a significant predictor of desire for analgesics ($p < 0.001$)

Under recognition of pain and physician not prescribing analgesics are major causes of oligoanalgesia identified.

Overall satisfaction with pain treatment is 68.9%

7. Limitation of The Study

The study tries to assess the practice of pain treatment and its impact on patient satisfaction in emergency department. It is by far not without limitations. Large number of patients were ineligible during initial screening.

Non pharmacologic methods of pain treatment were not given consideration in this study. They might have even affected the physician decision for prescription, patients' change in pain score and patient satisfaction.

8. Recommendations

Integration of pain recognition and treatment in the undergraduate and postgraduate studies is recommended, as there is a significant gap on physicians to recognize even patients with severe pain.

Pain treatment protocol will also help to make a standardized pain treatment practice in the ED. A quality improvement project may help to improve the 58.4% oligoanalgesia in the emergency room.

Night time patient analgesics order and administration needs due attention

Future studies may focus on non-pharmacologic analgesics methods.

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Annex 1.0 – Triage Early Warning Score (TEWS)

Score	Measured V/S	3	2	1	0	1	2	3
HR			≤ 40	41-50	51-100	101-110	111-129	≥ 130
RR			≤ 8		9-14	15-20	21-29	≥ 30
SBP		≤ 70	71-80	81-100	101-199		≥ 200	
SPO2					≥ 94%	90-93%	≤ 89%, not for CO & Severe Anemia	
TEMP			≤ 35		35.1-37.2	37.3-37.9	≥ 38.5	
Mobility					Walking	With Help	Stretcher/Immobile	
CNS/AVPU			Confused		Alert	React to Voice	React to Pain	Unresponsive
TRAUMA								

Triage Colour	RED	ORANGE	YELLOW	GREEN	BLACK
TEWS	≥ 7	5-6	3-4	1-2	Dead
Time to Treat	immediate	< 10 min	< 60 min	< 240 min	

Annex 2.0 Format of Verbal Consent Used

I am **Dr. Demmelash Gezahegn** a **Final Year Resident** in the Department of **Emergency Medicine** at Addis Ababa University, College of Health Sciences

I am conducting a research study to **assess the practice of pain treatment and its impact on Patient Satisfaction in Emergency Department**

The name of the study is **Pain Treatment Practice and Its Impact on Patient Satisfaction in Emergency Department: Experience from Tikur Anbessa Specialized Hospital**. The person in charge of the study is **Dr. Demmelash Gezahegn**.

If you agree to participate, you will be asked to rate the intensity of pain you are in and level of satisfaction on the second assessment. Your participation in this study does not involve any physical or emotional risk to you beyond that of everyday life. You are not likely to have any direct benefit from being in this research study. Taking part in this study may help researchers to better understand the current practice of Pain Treatment in Emergency and to identify gaps. You may choose to not participate in this research study, if you don't want to.

Participation in this study will involve no cost to you. You will not be paid for participating in this study. Study records that can identify you will be kept confidential by coding the questionnaires. Only the researchers will have control over your data. The results of the research study may be published, but your name will not be used. Your participation in this research study is completely voluntary. You can withdraw at any time. Choosing not to be in this study or to stop being in this study will not result in any penalty to you or loss of benefit to which you are entitled. Your choice to not be in this study will not negatively affect any rights to which you are otherwise entitled, including your treatment course in the Emergency.

Whom to contact with questions

If you have any questions or problems during your time on this study, you should call (Dr. Demmelash Gezahegn) as the person in charge of this research study and can be reached at +25191321929.

Consent Section

Do you wish to participate?

Record Subject's response:

Yes

No

Name (printed) and Signature of Person Obtaining Consent

Date

- b. Surgical emergency
- c. Trauma
- d. Oncologic emergency + Hematologic malignancy (Any patient with malignancy coming to ER with its complications)

To be filled After 2-4 hours of ED Stay

PART III

1. Working diagnosis for current presentation (Clinical impression + After Work up)
 - a.
 - b.
 - c.
 - d.
2. Was analgesic prescribed by treating physician? a. Yes b. No
3. **Did the patient ask for analgesics to the treating team?** a. Yes b. No
4. Was analgesics given/taken to the patient/by the patient in ER? a. Yes b. No
5. What analgesics, Route and dose?
 - a. Paracetamol.....
 - b. NSAIDs.....
 - c. Weak opioids
 - d. Strong opioids.....
 - e. Others.....
6. If no to question 4, why?
 - a. Analgesics not ordered by treating team
 - b. Patient couldn't afford to buy from hospital pharmacy
 - c. Medication not available in hospital pharmacy
 - d. Analgesic not yet administered by the treating team
7. **How is your pain (የህመም ስሜት፣ ስቃይ፣ ቃንዛ) now?**
 - a. Improved
 - b. The same
 - c. Worse
8. **Repeat Numeric Rating Score**

0 1 2 3 4 5 6 7 8 9 10
9. **How is your overall pain management in the ER? (በህመም ማስታገሻ ህክምናው ምን ያህል ረከተዋል?)**

1 2 3 4 5

PART IV

10. Length of stay in the ER
11. Disposition/ Outcome of Treatment in ER
 - a. Discharged home improved
 - b. Went home against medical advice
 - c. Admitted to ward
 - d. Transferred to other hospital
 - e. Died

Approval

This thesis has been submitted for examination with my approval as university advisor.

Name of Advisor: 1. Prof. Aklilu Azazh (MD, Professor of Emergency Medicine, Internist)

Signature:.....

Date:.....

Name of Advisor: 2. Dr. Tigist Zewdu (MD, Assistant Professor of Emergency medicine)

Signature:.....

Date:.....