



ASSESSMENT OF PATTERN, OUTCOME AND ASSOCIATED FACTORS
OF NON TRAUMATIC ACUTE ABDOMEN IN EMERGENCY
DEPARTMENT, ST. PAUL'S HOSPITAL MILLENNIUM MEDICAL
COLLEGE, ADDIS ABABA, ETHIOPIA

By: Jelalu Hussen (MD, EMCC Resident)

THIS THESIS SUBMITTED TO DEPARTMENT OF EMCC, St PAUL'S
HOSPITAL MILLENNIUM MEDICAL COLLEGE, FOR PARTIAL
FULFILLMENT OF THE REQUIREMENT OF SPECIALTY CERTIFICATE
IN EMCC

Jan, 2024

Addis Ababa, Ethiopia

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St. Paul's Hospital Millennium Medical College

Graduate Study Program

Name of investigator	Jelalu Hussen (MD, EMCC Resident)
Full title of the research project	Assessment of Pattern, Outcome And Associated Factors Of Acute Abdomen In Emergency Department, St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia, 2023
Duration of the project	From January 2022 G.C up to December 2022 G.C.
Study Area	SPHMMC
Total Cost of the project	34500
Source(s) of Funding	SPHMMC
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Abstract

Background: Acute abdomen is a major surgical problem in Ethiopia, requiring prompt diagnosis and surgery. This study aimed to assess the patterns, outcomes, and associated factors of non-traumatic acute abdomen in the Emergency Department of St. Paul's Hospital in Addis Ababa, Ethiopia, during 2022.

Objective: The objective of this study was to assess pattern, outcome and associated factors of non-traumatic acute abdomen in emergency department, St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia, 2022, Addis Ababa, Ethiopia.

Methods: Hospital based one-year retrospective cross-sectional study done on 356 participants (Jan 1 - Dec 30, 2022) extracted secondary data from adult non-traumatic acute abdomen patient records. Simple random sampling finalized the participants. Epi-Info v7 cleaned and SPSS v25 analyzed the data, including descriptive statistics. Goodness-of-fit was assessed with the Hosmer and Lemeshow test ($p=0.272$). Logistic regression explored the association ($p\leq 0.05$, 95% CI) between independent variables and acute abdomen management outcome, leading to the final interpretation and report.

Result: The study investigated 356 patients presenting with acute abdomen at St. Paul Hospital, Addis Ababa, Ethiopia. The most prevalent diagnoses were Acute appendicitis 46 (12.9%), perforated PUD 41 (11.5%), and Intestinal obstruction 33 (9.2%). Surgical management was implemented in 256 (72%) of cases, with an average length of stay of 3.8 days (range: 2-6 days). Post-operative complications were observed in 103 (28.9%) of patients, with intra-abdominal abscesses 37 (10.4%), surgical site infections 36 (10.7%), and wound dehiscence 30 (8.4%) being the most frequent occurrences. Notably, the mortality rate associated with acute abdomen was 53 per 1,000 patients, with a significant association observed between this outcome and various factors, including elevated heart rate ($P = 0.047$, AOR = 0.000, 95% CI = 9.529E-04 - 0.914), specific abdominal disorders Acute Cholecystitis ($P = 0.000$, AOR = 57.025, 95% CI = 37.475 - 62.135), Acute Appendicitis ($P = 0.000$, AOR = 26.001, 95% CI = 7.03 - 30.54), perforated PUD ($P = 0.000$, AOR = 77.605, 95% CI = 44.36 - 85.03), SBO ($P = 0.000$, AOR = 33.398, 95% CI = 29.058, 55.08) and post-operative complications.

Conclusion: Our study at St. Paul Hospital reveals both global echoes and Ethiopian nuances in managing acute abdomen. While sharing common presentations and surgical proficiency

with international settings, the slightly higher complication and mortality rates call for tailored interventions and resource allocation specific to the Ethiopian context. By embracing both global practices and regional needs, we can optimize care for acute abdomen patients in Ethiopia.

Key words: Acute abdomen ; Acute Appendicitis ; Perforated PUD Intestinal obstruction, ETHIOPIA .

Acknowledgements

Frist and foremost, it is my great pleasure to extend my sincere gratitude to creator of earth and heaven, Almighty God, who stand nearby me from my childhood to the moment of this proposal's work. I always thank him for he has not been left me alone. Next, I'm deeply indebted to my academic advisors, Dr. Dagimawi Tesfaye and Dr. Haimanot Tessema, who this work could have not been possible without their persistent advice, support, comment and encouragement. Finally but not the least, I am indebted to all of my colleagues, staff co-workers, classmates, and my families who directly and indirectly engaged in this work and boost my moral, thanks a lot!

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Acronyms

AA- Addis Ababa

AAA- Abdominal Aortic Aneurism

AOR- Adjusted odd ratio

DPL - Diagnostic Peritoneal Lavage

LBO- Large Bowel Obstruction

NRH-NEKMETTA REFRALE Hospital

PPUD - Perforated Peptic Ulcer Disease

REEA-Resection and End-End Anastomosis

RESA-Resection and End-Side Anastomosis

SBO- Small Bowel Obstruction

SPHMMC– Saint Paul’s hospital millennium medical college

TAH- Tikur Ambessa Hospital

ZMH - Zewuditu Memorial Hospital

AOR-adjusted odd ratio

CT-confidence interval

COR-crud odd rati

1. Introduction

1.1 Background

Acute abdomen is defined as a sudden onset abdominal disease condition which often requires an immediate surgical intervention. The causes of acute abdomen are several and their relative incidence varies in different populations. Several factors are described to be responsible for these differences. Socioeconomic factors and diet have mostly been incriminated to be responsible for the observed differences(1).

Age-related death rates vary, peaking at the oldest and youngest ages. The rupture abdominal aortic aneurysm, perforated peptic ulcer, and laparotomy for respectable malignancy all have the highest fatality rates. Age, sex, and ethnicity are among the most common causes in any group, as well as genetic and environmental influences(2).

In certain African nations, intestinal blockage has been the main cause of acute abdomen, but acute appendicitis is the most common cause in the industrialized world. Hernia and volvulus have been the main causes of intestinal blockage in Africans, although adhesions are more common in the industrialized world. However, certain African studies suggest that these well-established trends are changing(3).

On the other hand, intestinal blockage is the main cause of acute abdomen in a number of African nations. Various populations have various causes and proportional incidences of acute abdomen. These differences are attributed to a number of variables. Most of the responsibility for the observed discrepancy has been placed on socioeconomic factors and food(1)

1.2 Statement of the problem

In the practice of general surgery, the surgical acute abdomen is one of the emergencies that is frequently seen and treated with emergency surgery. The most common causes of acute abdomen include acute appendicitis, intestinal blockage, and perforated peptic ulcer disease (PPUD). Despite the fact that sophisticated surgery is performed, acute abdominal surgical emergencies still have a significant death rate. The overall mortality rate was 4.2%, while patients over 60 had a considerably higher mortality rate. Compared to non-operated patients, postoperative mortality was 5.8% higher than in non-operated patients. Preoperative deaths were caused by abdominal cancer (15.4%), perforated peptic ulcers (9.4%), and urgent colonic resections (9.4%) (1).

Due to socioeconomic, demographic, and dietary differences, the severity of surgically induced acute abdomen varies according to location. Additionally, the frequency of post-operative problems varies across settings and geographical regions. The ability to early clinically diagnose non-traumatic acute abdominal pain and place more attention on diagnosis and treatment time is greatly aided by knowledge of the severity, common causes, and common manifestations of this condition. Surgery for an acute abdomen is a common and largely preventable emergency, but by identifying and treating postoperative complications quickly, the risk of death can be decreased (4).

In Ethiopia little is known about general pattern of surgical acute abdomen. Knowing patterns of acute abdomen has epidemiological and clinical benefits. Patients with acute abdomen in Africa countries present late due to factors categorized as patients' factors and institutional inadequacies. Efforts to reduce delay may reduce complications. Surgery is often the only solution to prevent death from surgical cause of acute abdomen (5).

1.3 Significance of the study

This study result will benefit In St. Paulo's Hospital Millennium Medical College, studying the patterns and management outcomes And Associated Factors of acute abdomen can help the medical staff to provide better care for patients, inform medical education and research, and contribute to public health efforts in Ethiopia. And also, for:

Better patient care: Studying the patterns of acute abdomen can help medical professionals to identify the causes of the condition and come up with appropriate management options. This can lead to better patient outcomes and improved quality of care.

Public health: Acute abdomen is a significant health burden in Ethiopia, and understanding the patterns and management outcomes can help public health officials to design effective prevention and treatment strategies.

Improved medical education: By studying acute abdomen cases, medical students and professionals can gain a better understanding of the condition, its causes, and management options. This can lead to improved medical education and training.

Research: Studying patterns and management outcomes of acute abdomen can provide valuable data for research purposes. Researchers can use this data to identify risk factors, test treatment options, and develop new interventions.

The result of the study will also help the local Health institutions: regional Hospitals, Health centers, Zonal Health departments and Health Bureaus so that proper planning implementation and evaluation of perspective health service activities will be conducted in the area.

2. Literature review

2.1. Causes of Surgical Acute Abdomen

According to a study done at the Sinai Hospital in 2006, in Tehran Iran, 139 patients with acute abdomen had emergency laparotomies. The most frequent cause of acute abdomen was acute appendicitis (56.8%). In 67% of male patients and 38.8% of female patients, acute appendicitis was the underlying cause of acute abdomen. Other frequent causes of acute abdomen were peritonitis (14.4%), of which 5.7% were due to PPUD, perforated appendicitis (3.5%), pancreatitis (1.4%), and cholecystitis (7.2%). Bowel blockage 7.2%, of which 2.2% were caused by adhesion and volvulus, 1.4% by an imprisoned hernia, and just 0.7% by imagination (5).

Study done on 190 cases at Kamuzu Central Hospital in Lilongwe, Malawi, during the calendar year 2008 31% of the population was female, and 69% were men. The age range was 10 to 84, with a median of 32. Ten of the subjects were under the age of 18, with the youngest being 10 years old. Appendicitis (22%), intestinal volvulus (17%), perforated peptic ulcer (11%) and small bowel perforation were the most frequent etiologies (6). According to a study done in a tertiary hospital in North West Nigeria, out of a total of 1330 patients, 849 (or 63.8%) of them were men and 481 (or 36.2%) were women, making the male to female ratio there 1.77:1 (7).

Acute appendicitis was the most common cause of acute abdomen, accounting for 375 cases (55.26%), and it was more prevalent in individuals under 25 years old (occurring in 50% of cases). In this study, there were no patients over 55 who had acute appendicitis. The second most common cause of acute abdomen, accounting for 245 cases (18.42%), was intestinal obstruction. Typhoid ileal perforation 180 (13.53%), abdominal trauma 95 (7.14%), and perforated PUD 45 (3.38%) were the other causes of acute abdomen (8).

In study conducted at emergency department of combined military hospital Kharian, Pakistan (2012) the most frequent cause was found to be acute appendicitis (21.4%), followed by nonspecific abdominal pain (15.4%), acute Cholecystitis (12.7%), acute intestinal obstruction (14.5%), perforated duodenal ulcer (11.8%), renal colic (9%), acute pancreatitis (4%), acute gynecological disorders (4%), mesenteric ischemia (0.9%), Meckel's diverticulitis (1.3%), gastrointestinal perforation (1.3%), ileo-caecal tuberculosis (1.3%), perforated liver cell

carcinoma (0.4%), Ruptured giant liver abscess (0.4%), emphysematous pyelonephritis (0.4%) and typhlitis (0.4%) (9).

Retrospective research of 270 surgically treated acute abdominal cases at Wolaita Sodo University Teaching and Referral Hospital 2016 .reveals that 196 of the patients were men and 74 were women. The majority of patients—63.3% (171)—presented before surgery within 2–5 days of their sickness. Abdominal pain, vomiting, constipation, and abdominal distention were the predominant presenting symptoms, and 99.3% (268), 92.2% (249), 62.6% (169), and 53.3% (144) of the study participants, respectively, reported them. Bowel blockage (49.3% of cases; 133), acute appendicitis (31.5% of cases; 85), and peritonitis (19.2% of cases; 52) were the three leading causes of non-traumatic surgical acute abdomen. 40 (or 40.8%) of the 39 primary small bowel volvulus obstructions were nonviable, and 36 (or 90%) and 4 (or 10%) of them were treated by REEA and RESA, respectively. 43.1% (25) of the viable SBO cases had primary small intestinal volvulus blockage, and derotation was performed on them (10).

Emergency laparotomies for non-traumatic acute abdomen accounted for 43.3% of all laparotomies over a four-year period at Gondar University Hospital, according to the study. The most common surgical diagnoses were appendicitis (34.6%), SBO (43.4%), and LBO (11.5%). Acute abdominal patients who underwent surgery were mostly from rural locations (58.2%).The three most frequent symptoms in individuals with acute abdomen were abdominal pain (100%) and vomiting (90.3%), as well as abdominal distension (58.3%) and constipation (55.3%). Early (in the hospital) postoperative problems were present in 77 (26.6%) of the patients who underwent surgery (1).

Study conducted in Tikur Anbessa Hospital (TAH), 2016 Addis Ababa, Ethiopia, shows that from a total 2149 adult laparotomies, 587 (36.4%) were surgical emergency operations for acute abdomen. Acute appendicitis was the leading cause of acute abdomen which accounts 52%, of whom (67%) was males and (33%) females. Small bowel obstruction due to adhesions and volvulus were the leading causes of intestinal obstruction each accounting for 27%. Sigmoid volvulus was the leading cause of colonic obstruction (58.6%). PPUD was the 3rd most common cause of acute abdomen identified accounting for 9% of cases, for which simple closure with omental patch was done (1).

In a three-year retrospective study conducted at Zewuditu Memorial Hospital, 277 patients with a clinical diagnosis of acute appendicitis out of 653 patients with an acute abdomen

(72.6%) and (27.4%) were male, yielding a male to female ratio of 2.6:1. The average age at presentation was 25.6 years, ranging from 13 to 75 years old. 76.5 percent of cases (76.5%) involved people between the ages of 13 and 30. In Africa, appendicitis is regarded as a rare cause of acute abdomen. According to this study, acute appendicitis is a common condition in Africa. All patients' stomach discomfort presents clinically as shifting pain in 80.5% of cases, and concomitant vomiting in 76.9% of instances (4).

2.2. Management Outcome of Surgical Acute Abdomen

According to a study done in a tertiary hospital in North West Nigeria, out of a total of 1330 patients, 849 (or 63.8%) of them were men and 481 (or 36.2%) were women, making the male to female ratio there 1.77:1. 100 patients in total passed away, resulting in an overall mortality rate of 7.52%. Among all causes of mortality, typhoid ileal perforation accounted for 36 (20%), followed by intestinal blockage 40 (16.33%) and abdominal trauma 15 (15.79%)(7).

An investigation was done on 190 cases at Kamuzu Central Hospital in Lilongwe, Malawi, in 2008 31% of the population was female, and 69% were men. The total mortality rate from peritonitis was 15%, with solid organ rupture (35%), perforated peptic ulcer (33%), primary/idiopathic peritonitis (27%), tubo-ovarian abscess (20%), and small bowel perforation (15%) showing the greatest fatality rates. Age, gender, and symptoms (vomiting, constipation) as well as the length of the symptoms are factors that are linked to an elevated death rate(6).

The study conducted at Suhul General Hospital, Shire, Northwest Tigray, Ethiopia, from 166 patients who underwent emergency abdominal surgery for non-traumatic acute surgical abdomen 94(56.6%) patients were male and 72(43.4%) female. Fourteen patients (20.5%) who underwent surgery experienced an early post-operative problem. The post-operative complications were sepsis 1(0.6%), anastomosis leak 2(1.2%), pneumonia 3(1.8%), and wound infection 21(12.7%).During the study period, there were 7 fatalities, yielding a case fatality rate overall of 4.2% (11).

A total of 1006 adult surgical emergency operations were performed during the study period at Goba Referral Hospital. Of these, 299 patients were admitted with an acute abdominal diagnosis, accounting for nearly 30% of adult emergency surgical procedures. Surgery for an acute abdomen resulted in 281 (94%) patients improving, and 16 (5.4%) patients dying. The

three leading causes of death among patients who underwent surgery for acute abdomen were acute appendicitis, intestinal obstruction, and perforated PUD, respectively (12).

Hospital based cross sectional study conducted on 270 surgically operated patients in southern Ethiopia revealed that three top causes of non-traumatic surgical acute abdomen were bowel obstruction 49.3% (133), acute appendicitis 31.5% (85) and Peritonitis 19.2% (13) Study conducted in tertiary hospital of central Ethiopia on 587 acute abdomen patients indicated 36 deaths giving an overall mortality rate of 15.3% and higher mortality rate was observed in patients who presented late (1).

2.3. Associated factors of Surgical Acute Abdomen

A case-control study which involved 402 participants was carried out in Brazil. The research's findings indicated that fever, diarrhea, abrupt positive decompression, and changes in radiological and sonographic parameters were all associated with Complications (14).

According to the study done at Nekemte Referral Hospital, 230 (78%) men participated in the 295 instances of non-traumatic acute abdomen that were collected. The average age was 33.7 + 18.65 years, with ages ranging from 6 months to 80 years. Out of 295,158 patients, 56.7% were from rural areas. More than 51.5% of patients arrived within two days after being ill, and less than 8.1% arrived after seven days. Patients under the age of 14 had a 15.4 times higher chance of a successful management outcome compared to patients in other age groups [AOR=15.4, 95% CI (1.61- 19.98)]. Patients from rural areas are five times more likely than patients from urban areas to experience poor management outcomes [(AOR=7.5, 95% CI (1.46-38.46)] (15).

According to a study conducted at the Dill Chora Referral Hospital between October 2011 and September 2012, the age groups between 20 and 29 years old had the highest prevalence of acute abdominal patients (228 operated cases). The death rate from acute abdomen was 10.9%. AOR=3.89, 95% CI=1.094-13.84), age between 18 and 50 years old (AOR=5.06, 95% CI=1.327-19.349), and presentation season of September to November were all associated with the outcome of acute abdomen in a statistically significant manner(16).In a research conducted at Suhul General and Goba Referral Hospitals, patients who presented late had greater rates of morbidity and mortality (11).

According to hospital-based prospective cross sectional study conducted in Southern Ethiopia, Late presentation of patients before intervention, sex, age and postoperative complications were independent predictors with management outcome (17).

2.4 Conceptual Frame work

The following conceptual framework adapted and modified from a research done in Nekemte referral hospital will try to summarize cause of acute abdomen association factors between dependent and independent variables(15).

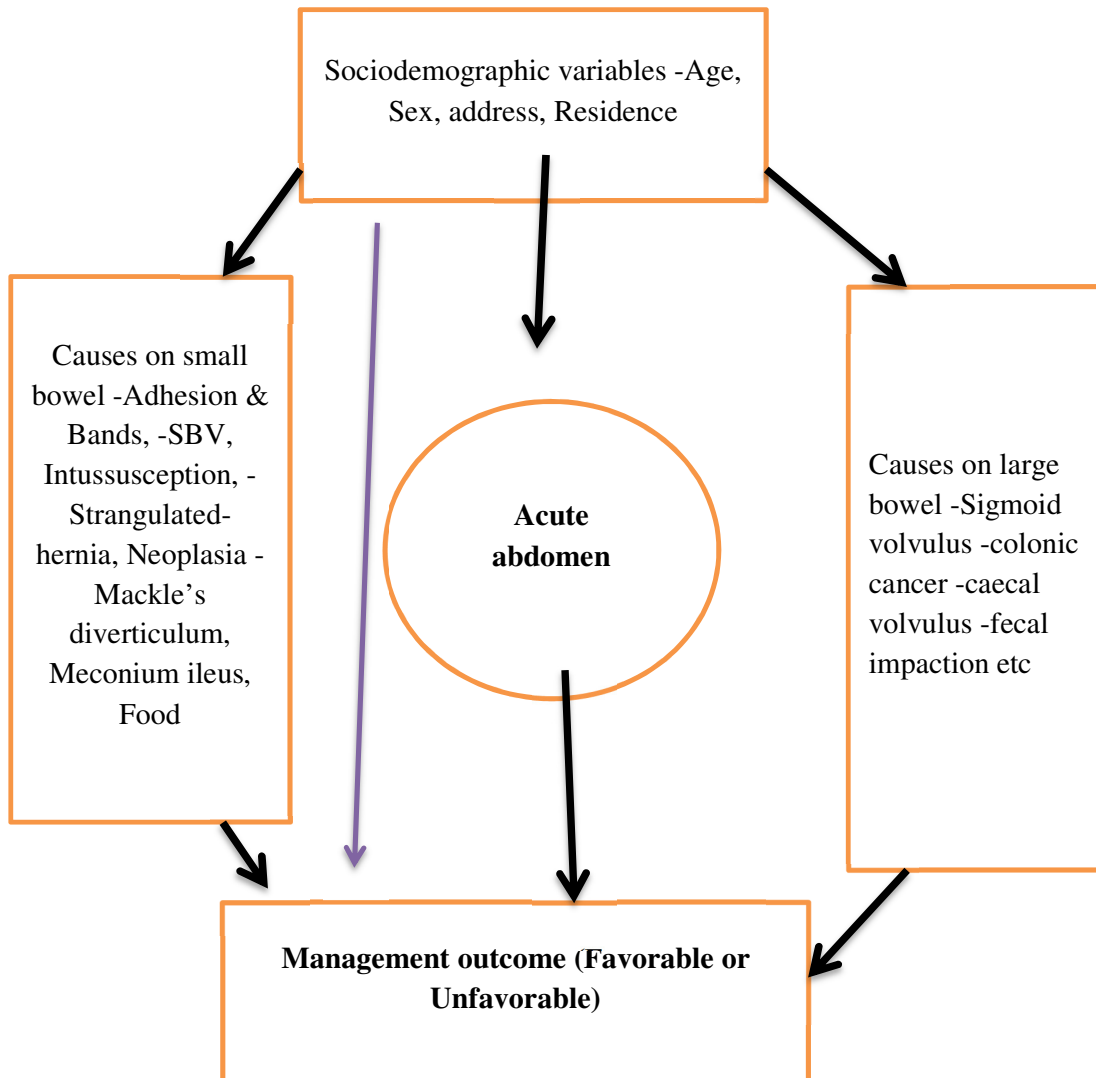


Figure 1: Conceptual framework on management outcome of acute abdomen

3. Objectives

3.1. General objective

General objective of this study was to assess pattern, outcome and associated factor of acute abdomen in emergency department, St. Paul`s hospital millennium medical college, Addis Ababa, Ethiopia,

3.2. Specific objectives

Specific objective of this study was:

- To determine pattern of patients with acute Abdomen admitted to emergency department of St. Pauls Hospital Millennium Medical College (SPHMMC).
- To asses management outcome of patients with acute abdomen admitted to emergency department of St. Pauls Hospital Millennium Medical College (SPHMMC).
- To identify factors associated with management outcome of patients with acute abdomen admitted to emergency department of St. Pauls Hospital Millennium Medical College (SPHMMC).

4. Methods

4.1. Study area and period

This study was conducted at Saint Pauls' Hospital Millennium Medical College . SPHMMC is one of the specialized and teaching hospital located in the northwestern part of Addis Ababa a capital city of Ethiopia. Its catchment population is over 5 million making it one of the largest referral centers in the country. As a tertiary center, it receives severe patients, which cannot managed with other hospitals from every corner of the country. The hospital has around 250 faculty members, more than 2800 clinical, academic, administrative and supportive staffs. Its inpatient capacity is more than 700 beds and the hospital gives a service for an average of 1200 outpatient and emergency clients daily. Furthermore, SPHMMC provides healthcare and training to its students through its different biomedical and clinical departments, including Anatomy, Physiology, Biochemistry, Pharmacology, Public health, Pathology, General Surgery, Internal Medicine, Obstetrics and Gynecology, Pediatrics and child health, Emergency Medicine, Urology, Neurology, Orthopedics, Psychiatry, Ophthalmology, ENT, Dentistry and Maxillofacial Surgery, Radiology, Anesthesiology, Nursing, ICU (Intensive Care Unit), ART (HIV care), Endoscopy, Physiotherapy, Laboratory and Pharmacy . The addresses of SPHMMC is info@sphmmc.edu.et or +251112750125. This study design was conducted from January to December , 2022.

4.2 Study design and period

A facility-based, one year retrospective study was Conducted to assess the pattern and outcome , Associated factors of non traumatic acute abdomen from January 2022 G.C up to December 2022 G.C.

4.3 Source population

Source population of this study was all surgical patients St. Paul's hospital millennium medical college.

4.4 Study population

Study population of this study were those patients who were diagnosed with non-traumatic acute abdomen in emergency department and admitted to surgical ward in St. Paul's hospital millennium medical college Emergency department.

4.5 Inclusion and Exclusion criteria

4.5.1. Inclusion criteria

All cases who were diagnosed with non-traumatic Acute abdomen at Adult Emergency department And Admitted to surgery ward SPHMMC, during the study period.

4.5.2. Exclusion criteria

Patients with diagnosis of Acute abdomen and who was operated, but do not have complete data and those who were arrested while surgical operation is ongoing, traumatic, gynecological, who operated out of SPHMMC and admitted after operation were not enrolled in this study.

4.6 Sample Size Determination

Sample size of this study was calculated using single population proportion formula at 95% of confidence interval and margin of error (d) 0.05 based on previous study conducted in Ethiopia where with the proportion of 36.4% (1).

$$\text{Accordingly, sample size (n)} = \frac{(Z^{\alpha}/2)^2 P(1-P)}{d^2} = \frac{(1.96)^2 \times 0.364 \times (1-0.364)}{(0.05)^2} = 356$$

4.7 Sampling procedure

Sampling technique and procedure of the study was followed this steps: first all acute abdomen patients were considered to be selected using medical registration number (MRN) from registration book of adult emergency department. Secondly, based on the eligible criteria mentioned in the above 'inclusion criteria' part, irrelevant participants were excluded from the sample frame and the rest were proceeded to the next procedure. Then next, relisting out MRNs of acute abdomen patients, 356 participants were selected from sampling frame using systematic random sampling using regular interval.

4.8 Data collection Tool and Data Collectors

Data extract checklist was prepared by principal investigator after reading literatures used in this study. The data was collected by trained physicians. Supervisors were follow the activity at the department and principal investigator were have a major role.

4.8.1 Data collection procedures

Patients who were admitted to Emergency Department of St. Paul's hospital with the diagnosis of non-traumatic Acute abdomen from January 1, 2022 - December 30, 2022 were identified from admission log-books of Emergency Department and card number of patients obtained accordingly. Then cards of the patients were identified and collected from file storage and used to collect important information.

4.9 Data management and analysis

Data was first checked manually for completeness and then entered and analyzed using SPSS version 25. Univariate and Bivariate logistic regression analysis were used to identify factors affecting **management outcome (Favorable and unfavorable)** in patient with non-traumatic Acute abdomen. The Multivariable analysis was done to control (adjust) for possible confounding variable. During the analyses P-value < 0.05 with 95% confidence interval (CI) for OR (odds ratio) were used in judging the significance of the associations. Results were presented in text, tables, charts and graphs.

4.10 Study Variables

4.10.1 Dependent variable

- Management Outcome (favorable/ unfavorable)

4.10.2 Independent Variables

- Age
- Sex
- Place of residence
- Causes of acute abdomen (Acute appendicitis, intestine obstruction, perforated PUD)
- Operative procedure
- Duration of illness

4.11 Operational Definition

- ✓ **Appendectomy:** - surgical removal of appendix for those of the organ, with acute appendicitis
- ✓ **Intussusception:** - Imagination of one part of bowel lumen in to the other resulted in obstruction

- ✓ **Peritonitis:** - Inflammation of peritoneum due to viscus perforation like Perforated PUD and appendix or gangrenous bowel
- ✓ **Acute abdomen:** - is any sudden condition with chief manifestation of pain of recent onset in the abdominal area which may require surgical intervention.
- ✓ **Intestinal obstruction:** - prevention of passage intestinal contents for functional or mechanical reasons and patient presented with abdominal pain, distension, vomiting & failure to pass feces and flatus.
- ✓ **Anastomosis:** - the surgical union of two hollow organs, e.g. parts of the intestine, to ensure continuity of the passageway
- ✓ **Anastomosis leak:** - refers to leakage through surgical union site post operatively and patient's vital signs deranged.
- ✓ **operative procedure:-** The procedure that can be done after laparotomy was done like appendectomy, omental patch, Resection-anastomosis
- ✓ **common presenting features:-** The reason why patient came to health facility (complaint of patients at presentation; chief complaint)
- ✓ **Management outcome :** condition of patient after operation and before discharge which may be favorable or unfavorable
- ✓ **Favorable management outcome :** patient cured and signs & symptoms resolved after operation without complications
- ✓ **Unfavorable management outcome:** patient died

4.12. Data quality control

To ensure the quality of data, preceding data collection, training of the data collectors was carried out for one day, on the objective, relevance of the study and confidentiality of information. English version questionnaire was pretested on 5% of the study population in similar areas outside of the study site at Tikur Anbessa specialized hospital, which is located 6 Km approximately from study area, prior to the actual data collection. Before data collection, the prepared checklists in English were assessed and commented by research advisors. The facilitators and supervisor were taken training for two days. During data collection, in order to avoid the interpersonal variation between data collectors, data were collected by the same data collectors throughout the data collection. Regular, twice per week supervision was taken place for checking the consistency and completeness of checklist by the principal investigator. Before starting data analysis, completeness was rechecked.

4.13. Ethical Considerations

Ethical approval and clearance was taken from Research and Ethics board of SPHMMC. The letter of permission was written to Emergency Department the purpose of the study was explained for the respondents and assent were obtained. The right to withdraw from the study at any time was also assure. Coding was used to eliminate names and other personal identification of respondents throughout the study process to ensure participants confidentiality.

4.14. Plan for dissemination of results

The findings of the study was submitted to the department of EMCC and it will be presented as one of the partial fulfillments of residency program in EMCC. All efforts were made to publish the results to the local and international journals. Furthermore, it will be presented on different meetings, national conferences and workshops. Then after, it will be prepared as manuscript to be published on reputable journals.

4. Chapter Four

4.0 Result

4.1 Socio-demographic Characteristics of the respondent

A total of 356 patients who were visited emergency department of St Paul Hospital were enrolled. Most of the participant were males 210 (59%) and females were 146(41%). The participants' ages ranged from 17 to 85. It's interesting to note that the majority of participants clustered around the mean age of 50.23. This finding raises the possibility that people in their mid-fifties are more vulnerable to particular post-operative problems, which calls for increased monitoring in clinical settings.

The study also looked at the participants' geographic distribution, finding that 71.1% of the participants 253 people hailed from urban areas, while 28.9% (103) people resided in rural areas. This unequal distribution begs the question of whether urban and rural people may have different access to healthcare and post-operative care.

Table 1. Socio demographic characteristics of the respondent and clinical features

Socio demographic characteristics		Clinical features and Frequency		
Mean Age	Range	Symptom	Frequency	Percent
50.23 ± 19.32	17 – 85	Tenesmus	260	73.03
Sex Ratio 3:2		Dysuria	68	19.10
		Abdominal pain	330	92.70
Residence	No of patient (%)	Vomiting	160	44.94
Rural	28.9	Fever	241	67.70
Urban	71.1	Loss of appetite	50	14.04
		Diarrhoea	237	66.57

A A = Addis Ababa. *356 patients

4.2 Assessment of Pattern and Outcome of Acute Abdomen

4.2.1 Causes Management and Outcome of Acute Abdomen

The result of this research revealed that 46(12.9%) were Acute Appendicitis, 45 (12.6%) Spontaneous primary peritonitis, 44 (12.4%) Ileo-sigmoid Knotting, 41 (11.5%) of acute abdomen is due to Perforated PUD, 40 (11.2%) Acute pancreatitis, 37 (10.4%) Acute cholecystic, 35 (9.8%) LBO, 35 (9.8%) Pelvic inflammatory disease and 33 (9.3%) SBO were acute abdomen. About 15% of acute abdomen cases has at least one mass. (**Table 2**)

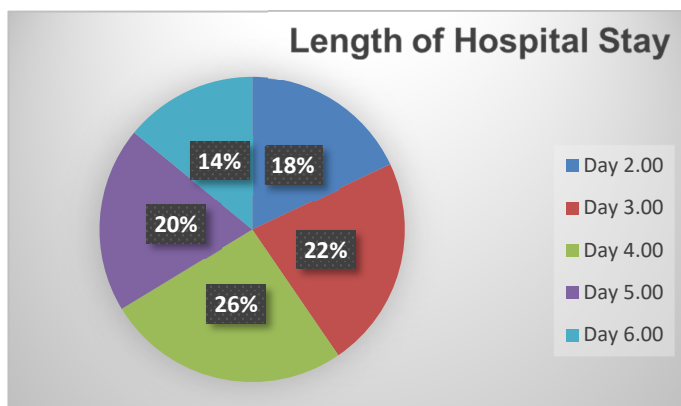
Table 2. Causes of Acute Abdomen

What was the case		
Cause of Acute Abdomen	Frequency	Percent
Acute Appendicitis	46	12.9
SBO	33	9.3
LBO	35	9.8
Perforated PUD	41	11.5
Ileo-sigmoid Knotting	44	12.4
Acute cholecystitis	37	10.4
Acute Pancreatitis	40	11.2
Pelvic inflammatory disease	35	9.8
Spontaneous primary peritonitis	45	12.6
Total	356	100.0

A A = Addis Ababa. *356 patients

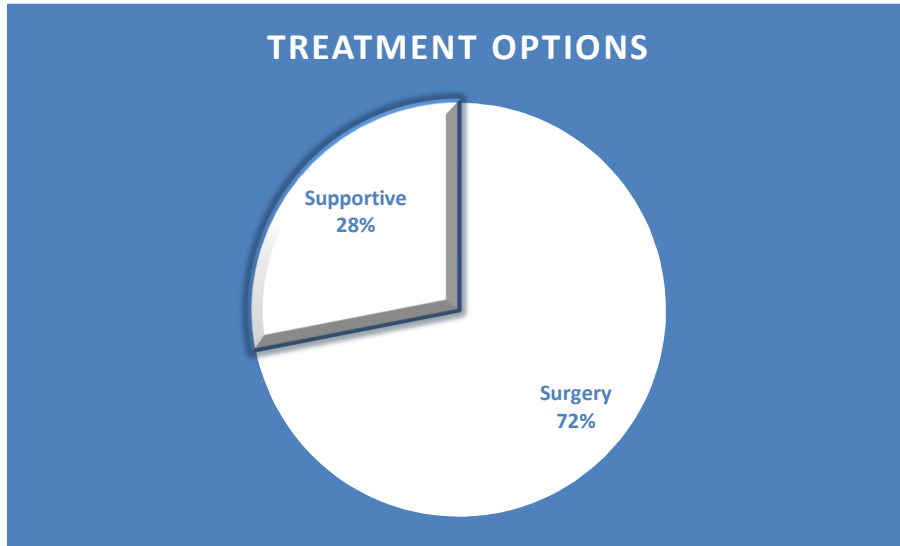
Based on the study results, patients in such cases typically stay between two and six days, with the majority (66%) being released after four days. According to a thorough investigation, 18% of patients were discharged within two days, 40% in three to four days, and 34% in five to six days. These findings imply that although most patients stay in the hospital for a comparatively short period, a significant number of them require a longer stay because of post-operative complications or the seriousness of their disease. (Figure 2)

Figure 2. Length of Hospital Stay in St. Paul



The research result found that about 72% (256) of the cases were managed by surgery; the rest 28% (100) were managed by supportive. (Figure 3)

Figure 3. Treatment options used in managing acute abdomen cases



The patient who were presented with post-operative complication were about 28.9%. Most of them were having Intra-abdominal collection Abscess 37(10.4%), surgical site infection about 36(10.7%), and 30 (8.4%) were having wound dehiscence complication. (Table 3).

Table 3. post-operative complications

Post-Operative Complications				
	Frequency	Percent	Valid Percent	Cumulative Percent
No Complication	153	59.76	59.76	59.76
Wound dehiscence	30	11.7	11.7	11.7
Intra-abdominal collection abscess	37	14.45	14.45	14.45
Surgical site infection	36	14.06	14.06	14.06
Total	256	100.0	100.0	

The study results also indicated that the mortality rate of patients with Acute Abdomen is 53 death per thousand people. Out of the 19 deaths, 10 were female and 9 were male. Therefore, the gender ratio of the deaths is 10:9 or 10 women for every 9 men. Cause of death were 10(52.6%) sepsis and 9 (47.4%) were from respiratory failure. Most of the patient 337 were healed. (Table 4)

Table 4. Treatment outcome and causes of death

Final Outcome and Cause of Death			
		Frequency	Percent
Final Outcome	Died	19	5.3
	Improved	337	94.7
	Total	356	100.0
Cause of Death (unfavourable)	No	337	94.7
	Sepsis	10	2.8
	Respiratory failure	9	2.5
	Total	356	100.0

4.3 Associated Factors of Acute Abdomen

This study looks at the factors associated with acute abdomen and post-operative complications in patients experience after surgery. The study employed statistical analyses (both binary and multinomial regression), including P-values and adjusted odds ratios (AOR), along with confidence intervals, to establish associations. Acute abdomen is a serious medical illness that frequently requires surgery. (Table 5).

The study indicated that elevated heart rate shows a significant association ($P = 0.047$, AOR = 0.000, 95% CI = 9.529E-04 - 0.914), suggesting it may serve as an indicator for increased risk of unfavourable complications following surgery.

The study also found certain abdominal disorders that have significant associations with post-operative problems. There was a significant association between acute cholecystitis and surgical outcomes ($P = 0.000$, AOR = 57.025, 95% CI = 37.475, 62.135). Similarly, there was a significant correlation found for perforated peptic ulcer disease (PUD) ($P = 0.000$, AOR = 77.605, 95% CI = 44.36, 85.03).

Acute appendicitis and small bowel obstruction were also found to be important risk factors for post-operative complications. Significant correlations were seen with acute appendicitis ($P = 0.000$, AOR = 26.001, 95% CI = 7.03, 30.54) and small bowel obstruction ($P = 0.000$, AOR = 33.398, 95% CI = 29.058, 55.08).

Table 5. Factors associated with favorable and unfavorable treatment outcomes in acute abdomen patients.

Associated Factors with Treatment Outcome (Improved, Dead)					
	Improved	Dead	COR 95% CI	Sig.	AOR 95% CI
If yes for post-operative complications, which of the following complication the patient develops			0.389 (0.108, 1.402)	0.095	21.827 (10.588, 42.83)
No	269	0			
Wound dehiscence	25	8			
Intra-abdominal collection abscess	28	9			
Surgical site infection	34	2			
Length of hospital stay			0.775 (0.547, 1.099)	0.265	0.373 (0.066, 2.114)
>= 2 days	61	3			
3 to 4 days	140	2			
5 to 6 days	106	15			
Does the patient has any post-operative complications			0.000 (0.000, .)		
YES	84	19			
NO	253	0			
What treatment options were considered or used for managing the acute abdomen case?			0.416 (0.319, 2.595)		
Surgery	210	16			
Suppository	93	3			
Acute appendicitis			0.219 (0.000, 1.283)	0.000	26.001 (7.03, 30.54)
Yes	39	7			
No	305	12			
Small bowel obstruction			0.002 (0.000, 1.000)	0.000	33.398 (29.058, 55.08)
Yes	15	18			
No	322	1			
Large bowel obstruction			0.919 (0.000, 3.629)		
Yes	33	2			
No	305	17			
Perforated PUD			2.023 (0.000, 3.154)	0.000	77.605 (44.36, 85.03)
Yes	40	1			
No	298	15			
Ileo-sigmoid knotting			2.633 (0.000, 3.625)		
Yes	43	1			
No	294	18			
Pelvic inflammatory disease			2.019 (0.000, 3.798)	1.000	1.000 (0.000, b)
Yes	34	1			
No	303	18			
Spontaneous primary peritonitis			0.854 (0.000, 1.000)	1.000	1.000 (0.000, b)
Yes	42	3			
No	295	18			
Acute cholecystitis			2.153 (0.000, 4.274)	0.000	57.025 (37.475, 62.135)
Yes	36	1			
No	301	18			
Acute pancreatitis			0.673 (0.000, 1.000)	1.000	28.376 (26.376, 35.636)
Yes	38	3			
No	301	16			

Heart rate (bpm)			0.917 (0.893, 0.943)	0.047	0.000 (9.529E-04, 0.914)
High		240	14		
Normal		95	5		
Tenesmus				1.20 (0.422, 2.745)	
	Yes	260	14		
	No	77	5		
Diarrhoea				0.846 (0.355, 2.257)	
	Yes	237	14		
	No	100	5		
Loss of appetite				0.487 (0.166, 1.207)	0.141
	Yes	50	5		
	No	287	14		
Abdominal distension				2.868 (0.880, 6.379)	
	Yes	255	10		
	No	80	9		
Fever				2.818 (0.790, 5.732)	0.267
	Yes	241	9		
	No	95	10		
Residency				1.559 (0.633, 4.115)	
	Yes	99	4		
	No	238	15		
Gender				1.118 (0.443, 2.820)	
	Female	10	7		
	Male	136	203		
Age in years?				1.004 (0.980, 1.029)	
	15 – 18	12	0		
	19 – 24	18	2		
25 – 35		66	2		
	36 – 45	56	3		
	46 – 55	47	3		
	56 – 65	49	3		
	66 – 79	71	2		
	80=<	18	4		

5. Chapter Five

5.0 Discussion

With 356 participants, this study at St. Paul Hospital in Addis Ababa, Ethiopia, sheds light on the trends, treatment, and results of acute abdominal patients in the Ethiopian medical system.

This research revealed a wide variety of underlying causes for acute abdomen. The most common diagnoses were found to be appendicitis (12.9%), small intestinal obstruction (9.3%), and perforated peptic ulcer disease (PUD) (11.5%). These results are consistent with those of other studies carried out in North-West Nigeria (55.26% appendicitis, 18.42% intestinal blockage), Malawi (22% appendicitis, 17% intestinal volvulus), and Iran (56.8% appendicitis). Our findings, however, are not consistent with certain Ethiopian studies that give intestinal blockage a higher prevalence than appendicitis. This demonstrates how important it is to take regional differences into account when creating strategies for treatment and distributing funds.

In relation to the course of treatment and the length of hospital stay, Similar to results from other Ethiopian hospitals (77% in Gondar University Hospital and 94% in Goba Referral Hospital), the majority of cases (72%) were treated surgically. This implies that surgical proficiency is uniform across the entire country. Interestingly, the duration of stay (2–6 days) in our study is similar to what has been observed in other contexts (2–5 days in Wolaita Sodo University Teaching and Referral Hospital). This could point to effective patient management procedures and resource allocation.

Our study found a 28.9% risk of post-operative complications, with the most frequent events being intra-abdominal abscesses (10.4%), surgical site infections (10.7%), and wound dehiscence (8.4%). Similar results were obtained from other Ethiopian hospitals (20.5% at Suhul General Hospital and 15.3% at Nekemte Referral Hospital) regarding this complication rate. But our study's death rate (53/1000) is a little bit higher than what other hospitals have reported (4.2% at Suhul General Hospital and 5.4% at Goba Referral Hospital). Further research into possible relevant elements in our situation is necessary in light of this disparity.

In terms of the associated factors, elevated heart rate emerged as a predictor of high risk, in line with findings from a study conducted in Brazil. Furthermore, it was discovered that a number of specific abdominal conditions posed a considerable risk for complications,

including small intestinal obstruction (9.3%), acute appendicitis (12.9%), perforated PUD (11.5%), and acute cholecystitis (10.4%). This is consistent with findings from other research that emphasize the necessity for customized treatment plans that take the patient's general health and underlying reason into account.

This study results highlight the necessity of ongoing initiatives to standardize surgical methods by Optimizing surgical results and minimizing complications can be achieved by utilizing evidence-based recommendations and best practices. Enhance post-operative care by putting into practice efficient infection prevention and control. This will have a big impact on patients' ability to heal. To improve surgical capacity and manage the volume of acute abdominal cases, it is imperative to invest in infrastructure, equipment, and qualified personnel in order to address resource restrictions. By considering regional differences and customizing treatment modalities to the Ethiopian setting, we can create guidelines that are context-specific and improve patient results.

Additional investigation is required to fully explore the significance of particular issues. Examine the long-term effects of abdominal pain. Rehabilitation and support services can be directed by an understanding of the condition's long-term effects on the health of the patients. By incorporating research findings and customizing evidence-based guidelines to the unique requirements of the Ethiopian healthcare system, we can guarantee that patients with acute abdomens receive the best possible care. By situating our results within the framework of previous studies, we are able to have a thorough grasp of the parallels and differences in acute abdominal care amongst various geographical areas. Future clinical research and practice can benefit from this knowledge, which will ultimately enhance patient outcomes and care. This knowledge can inform future research and clinical practice, ultimately leading to improved patient care and outcomes in Ethiopia and beyond.

Finally, this study recommends the following steps be taken to improve the management of acute abdomen in Ethiopia. Starting with standardizing surgical techniques with evidence-based protocols; improving post-operative care with strong protocols for pain management, infection prevention, and early mobilization; addressing resource limitations through infrastructure upgrades, equipment acquisition, and staff training; creating guidelines that are specific to the Ethiopian healthcare system; and constant refinement of evidence-based guidelines to guarantee the best possible care for patients.

In conclusion, the strength of this study lies in its substantial sample size of 356 participants, providing a robust foundation for analysing patterns, management, and outcomes of acute abdomen cases. By focusing specifically on the Ethiopian context, the research delves into unique challenges and opportunities related to acute abdomen management in this region. Comprehensive data collection, encompassing demographics, clinical presentations, diagnoses, treatments, complications, and mortality rates, contributes to a holistic understanding. Additionally, the study's comparison with previous research strengthens the analysis by identifying both similarities and discrepancies across different regions. The identification of novel findings, such as the unexpected association between dysuria and a lower risk of post-operative complications, adds depth to the study's contributions. However, limitations include its single-centre design, potentially limiting generalizability, a retrospective approach that restricts establishing causality, the absence of a long-term assessment of patient health impacts, and the potential for selection bias due to recruiting participants from a single hospital. These limitations underscore the need for cautious interpretation and the potential for variations in the broader population with acute abdomen in Ethiopia.

Chapter Seven

6.0 Conclusion

6.1 Conclusion

This Study at St. Paul Hospital, Addis Ababa, illuminates the nuanced landscape of managing acute abdomen within the Ethiopian healthcare system. Drawing on both quantitative and qualitative data from 356 patients, offer insights into patterns, treatment, and outcomes, revealing not only global echoes but also distinct local challenges.

The prevalence of appendicitis, small bowel obstruction, and perforated peptic ulcer disease as leading diagnoses aligns with international studies, highlighting the universality of certain risk factors and the importance of evidence-based protocols. Surgical success and average hospitalization duration mirror observations elsewhere, showcasing the proficiency and efficiency of surgical care within Ethiopian hospitals. These findings suggest a shared foundation for managing common acute abdominal presentations, paving the way for collaborative knowledge exchange and best practice dissemination.

However, our research delves deeper, unearthing regional complexities that whisper the need for tailored interventions. The slightly higher post-operative complication rate and mortality figure compared to some Ethiopian hospitals warrant further investigation. Addressing these local nuances through targeted interventions and resource allocation is crucial for improving patient outcomes.

In conclusion, our journey through the complexities of acute abdomen in Ethiopia underscores the importance of both global best practices and regional specificities. By embracing the multifaceted data landscape, we can refine evidence-based guidelines, and optimize resource allocation. This comprehensive approach improve care for acute abdomen patients in St. Paul's Hospital Millennium Medical College.

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7.1 Assurance of Principal Investigator

I the undersigned agree to accept all responsibilities for the scientific and ethical conduct of the Research paper. I will provide timely progress report to my advisor and seek the necessary Advice and approval from my primary advisors in the course of the research. I will communicate timely to my advisors all stakeholders involved in the study including any source of funding for this research.

Name of the student: Jilalo Hussein

Signature: _____

Date: _____

Approval of the Primary Advisor

Name of the primary advisor: _____

Signature: _____

Date: _____

Approval of the Co-Advisor

Name of the primary advisor: _____

Signature: _____

Date: _____

Annex 1

Data extraction checklist

Part 1: Socio-demographic characteristics

S.N	Variables	Response
1	Age in years	-----
2	Sex	1. Male 2. Female
3	Residency	1. Urban 2. Rural

Part 2: Symptoms of acute abdomen and vital signs

S.N	Variables	Response
1	Abdominal pain	1. Yes 2. No
2	Vomiting	1. Yes 2. No
3	Fever	1. Yes 2. No
4	Failure to pass feces and/flatus	1. Yes 2. No
5	Abdominal distension	1. Yes 2. No
6	Loss of appetite	1. Yes 2. No
7	Diarrhea	1. Yes 2. No
8	Dysuria	1. Yes 2. No
9	Tenesmus	1. Yes 2. No
10	Other	1. Yes 2. No
11	Heart rate (bpm):	
	Blood pressure (mmHg):	
	Respiratory rate (breaths per minute):	
	Temperature (°C):	

Part 3: Signs of acute abdomen

S.N	Variables	Response
1	Direct tenderness	1. Yes 2. No
2	Rebound tenderness	1. Yes 2. No
3	Tachycardia	1. Yes 2. No
4	Abdominal distension	1. Yes 2. No
5	Fever	1. Yes 2. No
6	Guarding	1. Yes 2. No
7	Mass per abdomen	1. Yes 2. No

8	Hyperactive bowel sounds	1. Yes 2. No
9	Positive sound of peritoneal fluid collection	1. Yes 2. No
10	Other/associated signs	1. Yes 2. No

Part 3: Causes of acute abdomen

S.N	Variables	Response
1	Acute appendicitis	
2	Small bowel obstruction Post-op adhesion Hernia Intussusception Small bowel/ileocecal mass Small bowel volvulus	
3	Large bowel obstruction Sigmoid volvulus Large bowel tumors	
4	Perforated PUD	
5	Ileo-sigmoid knotting	
6	Pelvic inflammatory disease	
7	Spontaneous primary peritonitis	
8	Acute cholecystitis	

Part 4: Laboratory investigations and diagnosis

S.N	Variables	Response
1	What imaging modalities were used for evaluation	
2	What were the findings from the imaging studies	
3	Has the patient received any analgesic medication before assessment in the emergency department	
4	laboratory investigations	
5	Has the patient received any analgesic medication before assessment in the emergency department	CBC Cr BUN K+ Na Ca2+