PREVALENCE, CLINICAL FEATURE AND OUTCOME OF ACUTE APPENDICITIS AMONG ADULT PATIENTS ADMITTED TO HIWOT FANA COMPREHENSIVE SPECIALIZED HOSPITAL, HARAR, EASTERN ETHIOPIA

GENERAL SURGERY SPECIALITY THESIS

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February 2025

HARAMAYA UNIVERSITY, HARAR

Prevalence, clinical feature and Outcome of Acute Appendicitis Among Adult Patients admitted to Hiwot Fana Comprehensive Specialized Hospital, Harar, Eastern Ethiopia

A Thesis Submitted to The School of Medicine,

Post Graduate Programs Directorate

HARAMAYA UNIVERSITY

In Partial fulfillment of the requirement for the Degree of

MEDICINE IN GENERAL SURGERY SPECIALITY

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I hereby certify that I have read and evaluated this Thesis entitled "Prevalence, clinical feature and Outcome of Acute Appendicitis Among Adult Patients in Hiwot Fana Comprehensive Specialized Hospital, Harar, Eastern Ethiopia" prepared under my guidance by Dr. Hamse Migane Rayale. I recommend that it be submitted as fulfilling the thesis requirement.

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ACKNOWLEDGMENTS

My sincere and deepest gratitude goes to Haramaya University, College of Health and Medical Sciences, School of Medicine, Department of Surgery for providing me with an opportunity to prepare and conduct this study project. My thanks also go to my advisors, Dr Elias Serte and Dr Basit Ibrahim who supported me starting from developing my proposal up to now with full interest, encouragement and constructive criticisms. I would like to thank everyone wo assisted me in this thesis work, including the staff members and administration of Hiwot Fana comprehensive specialized hospitals, for their cooperation in providing me with all the necessary support during the writing of my research project, the data collection and processing. I would like to thank my colleagues for vital comments and supports during the design of the study.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONOMYS AND ABBREVATIONS

AA	Acute Appendicitis
ACHS	Amoud College of Health Science
HFCSH	Hiwot Fana Comprehensive Specialized Hospital
IHRERC	Institutional Health Research Ethics Review Committee
OR	Operation Room
RIF	Right Iliac Fossa
RLQ	Right Lower Quadrant
SGS	School of Graduate Studies
WBC	White Blood Cell

ABSTRACT

Introduction: Acute appendicitis is one of the most common surgical emergencies worldwide, characterized by inflammation of the appendix. The condition necessitates prompt diagnosis and surgical intervention to prevent complications such as perforation, peritonitis, and sepsis, which can be life-threatening. Despite the commonality of acute appendicitis, its prevalence, clinical presentation, and outcomes can vary significantly across different regions and healthcare settings. In this study setting (Hiwot Fana Comprehensive Specialized Hospital), there is limited data on assessment of the prevalence, clinical feature and treatment outcome of acute appendicitis.

Objective: To assess the prevalence, clinical feature and treatment outcome of acute appendicitis among adult patients admitted to Hiwot Fana Comprehensive Specialized Hospital from January 1, 2019 to December 31, 2023. Data collection was conducted from October 1-30, 2024.

Methods: A descriptive cross-sectional study design was employed among patients admitted to Hiwot Fana Comprehensive specialized hospital with clinical diagnosis of appendicitis. The sample size was 330 and census type sampling techniques applied. Data were extracted from patient chart using structured data collection format. After data quality checked. Data were collected by kobo toolbox and transferred into SPSS version 27 for analysis. Descriptive analysis was computed and described in text, graph and tables.

Results: Out of 1818 patient underwent surgery from emergency department, Appendectomy were performed for 309 (16.99%) patients. The most common clinical presentation, incision type and intra-operative findings was periumbilical pain shifting to right lower quadrant (89%), right lower quadrant transverse (98.7%) and inflamed appendix with inflammatory peritoneal fluid (73.46%), respectively. Only 29 patients (9.36%) developed complications in the post-operative period. The mean hospital stay was 3.2 days.

Conclusions: In this study the prevalence of acute appendicitis is 16.99 %. The most common clinical presentation, incision type and intra-operative findings was periumbilical pain shifting to RLQ, right lower quadrant transverse and inflamed appendix with inflammatory peritoneal fluid respectively. Only 29 patients (9.36%) developed complications in the post-operative period.

Key words: Acute appendicitis, Adult, Prevalence, Hiwot Fana Comprehensive Specialized Hospital

1. INTRODUCTION

1.1 Background

Acute appendicitis is a condition characterized by severe inflammation of the vermiform appendix. It occurs when the lumen of the appendix becomes obstructed, leading to inefficient emptying into the colon. Acute Appendicitis is the most frequent cause of acute inflammation in the right lower quadrant of the abdomen and is a leading cause of emergency abdominal surgery worldwide (Adu and Birhanu, 2021)..Acute appendicitis is a leading cause of acute abdominal surgery, with an incidence ranging from 86.2 to 106 cases per 100,000 population (Golz *et al.*, 2020). Appendicitis initially described in 1886 by pathologist reginald fitz, continues to be a major cause of abdominal pain seen in emergency departments. in the United States alone, over 250,000 cases of appendicitis are diagnosed annually, making appendectomy the most common emergency surgery worldwide (Vissers and Lennarz, 2010). The lifetime risk of developing appendicitis is estimated to be 7-8% in the general population. However, appendicitis is still associated with significant morbidity (10%) and mortality (1-5%)(Jamal, 2021).

Despite notable improvements in imaging accuracy, appendicitis still poses a significant risk of delayed or missed diagnosis in the emergency department. therefore, in cases of suspected acute appendicitis, some authors continue to rely on clinical parameters for diagnosis, with supplemental imaging modalities reserved for atypical presentations, pediatric patients, and reproductive-age females. clinical evaluation alone may not be sufficient to distinguish acute appendicitis from other abdominopelvic conditions in these patient groups (GEBRE SELASSIE *ET AL.*, 2021).

The surgical treatment of acute appendicitis has experienced a shift from open appendectomy to laparoscopic appendectomy, not only in adults but also in pediatric cases.(Di Saverio *et al.*, 2016). Due to resource limitations in our low-income country, our hospital does not have the capability to perform laparoscopic procedures. Therefore, all the procedures included in this study were open surgeries. Complications related to acute appendicitis have been found to be higher in cases of delayed presentation, elderly patients, and intraoperative identification of complicated appendicitis (GEBRE SELASSIE ET AL., 2021).

Treatment outcomes for acute appendicitis can be influenced by factors such as extreme age, delayed presentation, stage or duration of the condition, antibiotic use outside of healthcare facilities, presence of comorbidities, and the patient's immunologic status. In the developing world, morbidity and mortality rates following surgical treatment for acute appendicitis remain significant challenges (Afenigus *et al.*, 2022).

1.2 Statement of the problem

According to the global burden of disease, there were 17.7 million cases of appendicitis worldwide in 2019, which resulted in 33,400 deaths . (Wickramasinghe *et al.*, 2021).

Approximately 10% of the population in the developing world experiences acute appendicitis during their lifetime.(Shakya, 2023).Acute appendicitis is the most common cause of surgical acute abdomen. It is estimated that approximately 10% of the population will experience appendicitis in their lifetime. In regions like Europe, America, and Australasia, up to 16% of the population undergo appendectomy for appendicitis. However, diagnosing acute appendicitis can be challenging even for experienced clinicians due to the presence of various clinical conditions that mimic its symptoms (Obsa *et al.*, 2020). Data from newly industrialized countries suggest a rapid rise in appendicitis cases, although the incidence is still lower compared to the developed world. Appendicitis trends in South Africa align with those observed in developing regions (Weledji, 2022)

Ferris et al. (2017) found that the global incidence of appendicitis was 100 per 100,000 person-years in Northern America. Furthermore, since 2000, newly industrialized countries in Asia, Southern America, and Africa have experienced an increasing incidence of appendicitis. The lack of population-based studies on appendicitis incidence in developing countries underscores a significant gap in the existing literature.(Ferris *et al.*, 2017).

Acute appendicitis is more common in low-income countries in Africa. A study conducted in western Sudan; the prevalence of acute appendicitis was found to be 63% out of 421 patients with Acute abdomen (Edino *et al.*, 2004). Similarly, in Nigeria, the prevalence was reported to be 38.2% (Doumi and Mohammed, 2009). Potential risk factors for acute appendicitis include a low-fiber diet and gastrointestinal infections. Eating a high-fiber diet rich in whole grains, fresh fruits, and vegetables can be a preventive measure against appendicitis. Other factors that may contribute to the development of appendicitis include infection in the gastrointestinal tract, inflammatory bowel disease, parasites, a low-fiber diet, high intake of refined carbohydrates, and fecal impaction (Adu and Birhanu, 2021).

A meta-analysis done in Ethiopia included a total of 15 studies with 6886 study subjects. The pooled prevalence of acute appendicitis in Ethiopia was 46.95 % (95% CI, 41.62 to 52.28 %) with the Tigray region having the highest prevalence rate at 51.98%, followed by Addis Ababa at 49.53%, and the Oromia region at 47.75%. These discrepancies in the reported prevalence rates among studies in Ethiopia make it challenging to establish a comprehensive understanding of the true prevalence of AA. (Bereded and Lohide, 2024)

Appendicitis can lead to serious complications, including general peritonitis, abscess formation, and even death. These complications not only pose a significant risk to the individual's health but also place a burden on healthcare resources (Abdulla *et al.*, 2023) .As the most common intra-abdominal surgical emergency, where the majority of patients require surgery, and the surgery itself can be associated with complications, appendicitis accounts for a significant portion of healthcare expenditure. A better understanding of the disease epidemiology and trends will facilitate optimal resource allocation and superior patient outcomes (Wickramasinghe et al., 2021).

Despite the commonality of acute appendicitis, its prevalence, clinical presentation, and outcomes can vary significantly across different regions and healthcare settings. In Ethiopia, particularly in this study setting in Harar, there is limited data on the epidemiology and management outcomes of acute appendicitis. Understanding these local variations is crucial for improving patient care and outcomes and contributing practicable recommendations based on the study findings, so that this study aimed to assess the prevalence, clinical feature and treatment outcome of acute appendicitis among adult patients admitted to Hiwot Fana Comprehensive Specialized Hospital.

1.3 Significance of the Study

It helps HFCSH and other health institutions to improve diagnostic accuracy by identifying common clinical presentations, symptoms, and signs associated with the condition. This aids in making timely and accurate diagnoses, reducing misdiagnoses and unnecessary surgeries.

Second, understanding the Prevalence of acute appendicitis is essential for public health planning. It allows healthcare authorities to allocate appropriate resources, such as hospital beds, surgical facilities, and healthcare personnel, based on the incidence rates in different populations, age groups, and geographical regions. This ensures timely treatment for patients and optimizes healthcare services. The research serves as a valuable foundation and catalyst for future research endeavors. By providing a springboard for exploration, guiding the direction of future studies, and inspiring new methodologies, it contributes to the cumulative growth and development of knowledge in related areas.

1.4 Objectives

1.4.1 General objective

To assess the prevalence, clinical feature and treatment outcome of acute appendicitis among patients admitted to Hiwot Fana Comprehensive Specialized Hospital from January 1, 2019 to December 31, 2023. Data collection was conducted from October 1-30, 2024.

1.4.2 Specific Objectives

- To assess the prevalence of acute appendicitis among patients admitted to Hiwot Fana Comprehensive Specialized Hospital.
- To identify clinical features of acute appendicitis among patients admitted to Hiwot Fana Comprehensive Specialized Hospital.
- To determine treatment outcome of acute appendicitis among patients admitted to Hiwot Fana Comprehensive Specialized Hospital.

2. LITERATURE REVIEW

2.1 Prevalence of acute appendicitis

Epidemiological data on the prevalence of acute appendicitis (AA) and deaths were collected from the Global Health Data Exchange (GHDx) repository in 1990- 2019, there were approximately 17.7 million cases of AA worldwide, with a prevalence rate of 228 cases per 100,000 population. During the same period, there were over 33,400 deaths related to AA, resulting in a mortality rate of 0.43 deaths per 100,000 population. From 1990 to 2019, both the total number of cases and the incidence rate of AA increased by 38.8% and 11.4% respectively. However, the number of deaths and the mortality rate per 100,000 population declined by 21.8% and 46.2% respectively during this time period (Ferris et al., 2017).

A retrospective observational population-based cohort study conducted at General Hospital, Shisong, in the northwestern region of Cameroon from January 2006 to January 2016 revealed that out of an estimated total of 32,480 surgical operations, appendectomy accounted for 1,250 cases (3.85%). Therefore, the standardized incidence rate of appendicitis was 3.85 per 100,000 per year (Alegbeleye *et al.*, 2019). A prospective cohort study was conducted at Menelik II Referral Hospital in Addis Ababa, involving 227 patients evaluated at the adult emergency department. The patients were diagnosed with acute appendicitis based on clinical, laboratory, and imaging parameters during the study period and subsequently underwent surgery. Acute appendicitis accounted for 46.4% of all emergency operations during that time (Gebre Selassie et al., 2021).

A cross-sectional study done conducted in the surgical department of St. Paul's Hospital Millennium Medical College (SPHMMC) in Addis Ababa, Ethiopia from September 01, 2023 to December 01, 2023 G.C showed that the prevalence of acute appendicitis was higher among males in the 10-19 age group with 85 cases (22.1%). Similarly, among females, the prevalence was higher in the 10-19 age group with 43 cases (11.2%). Conversely, the prevalence of acute appendicitis decreased with age in both males and females (Bereded and Lohide, 2024).

Retrospective cross-sectional study done at Hawassa University Comprehensive Specialized Hospital from July 2020-Jun 2021 in Surgical ward showed that among the total 237 study patient card review the magnitude of AA was 36(15.2%) of them developed acute appendicitis while 201(84.8 %) of them did not develop acute appendicitis (Mosa, 2022).As to the place of residence, an observational prospective cohort study in St. Paul’s Hospital Millennium Medical

College, Addis Ababa, Ethiopia reported the majority of the patients (88.5%) came from the capital city (Gebre Selassie et al., 2021).

2.2 clinical features of acute appendicitis

A retrospective observational study conducted at the Department of Surgery, Chaya People's Hospital, Tibet revealed that the main symptoms and signs (frequency >50%) of appendicitis in patients who underwent appendectomy were right lower quadrant (RLQ) tenderness (100.0%), RLQ pain (97.8%), rebound tenderness (88.2%), nausea or vomiting (75.3%), and migratory pain (59.1%). A higher proportion of patients with complicated appendicitis presented with fever than those with uncomplicated appendicitis (31.6% vs. 9.1%; p=0.006). No significant differences were found between the two groups for other signs and symptoms. The study noted that since RLQ tenderness is a physical exam-based finding and RLQ pain is a complaint-based symptom, sometimes the two may not be consistent (Liu *et al.*, 2023)

In a cross-sectional study conducted in the surgical department of St. Paul's Hospital Millennium Medical College (SPHMMC) in Addis Ababa, Ethiopia, the researchers reported that all patients had an initial attack of abdominal pain, which either became localized to the right lower quadrant or diffuse. This was followed by anorexia in 378 (98.4%) of the patients, nausea and vomiting in 336 (87.7%), and fever in 231 (60.2%) of the patients. The key physical findings were right lower quadrant tenderness in 340 (88.5%) patients, diffuse abdominal pain in 32 (8.3%), and a right lower quadrant mass in 10 (2.6%) patients. The associated symptoms at presentation included diarrhea in 24 (6.3%), upper respiratory tract infection in 18 (4.7%), and dysuria in 12 (3.1%) patients. At the time of diagnosis, the mean pre-operative white blood cell count was 13,500 cells/mm3 (SD = 4.9), ranging from 3,000 to 3,200 cells/mm3, and the mean granulocyte count was 81% (SD = 9.2), ranging from 45% to 96% (Bereded and Lohide, 2024).

In an observational prospective study conducted in a teaching hospital in Addis Ababa, Ethiopia, the mean duration of symptoms was 51.34 ± 100.5 hours, with a range of 4 hours to 10 days. The median duration was 29 hours, and the mode was 24 hours. The most common presenting symptom was abdominal pain, reported in 223 (98.2%) patients, followed by migration of abdominal pain in 186 (81.9%) and anorexia in 159 (70%) patients. The most common physical sign was right lower abdominal tenderness, observed in 212 (93.4%) patients. At the initial evaluation in the emergency department, 72 (31.7%) of the patients were

tachycardic, 39 (17%) were febrile, and 2 (0.9%) were hypotensive (Gebre Selassie et al., 2021).

A cross-sectional study was conducted at Debre Markos Referral Hospital in the Amhara Region of North West Ethiopia from 2018 to 2019, in patients with acute appendicitis, abdominal pain was consistently the primary complaint. Among the participants, 119 (70.4%) initially experienced periumbilical pain that later shifted to the right lower quadrant (RLQ) of the abdomen, 33 (19.5%) had RLQ abdominal pain, 14 (8.3%) had generalized abdominal pain, two (1.2%) had pelvic pain, and one (0.6%) had flank pain. Additionally, among the study participants, 156 (92.3%) reported experiencing nausea/vomiting, 151 (89.3%) had anorexia, and 149 (88.2%) had fever as accompanying symptoms. Out of the respondents, seven (4.1%) mentioned constipation, seven (4.1%) mentioned diarrhea, and 11 (6.5%) mentioned dysuria as their presenting complaints (Afenigus et al., 2022)

2.3 Management related factors

2.3.1 Socio-demographic characteristics

In Pakistan, a facility-based cross-sectional study was conducted in the surgical department of Combined Military Hospital, Rawalakot, from October 2020 to March 2021. The sample size included 102 patients, comprising 61 males (60%) and 41 females (40%), resulting in a male-to-female ratio of 3:2 (Zafar *et al.*, 2021). In a cross-sectional hospital-based study conducted in the surgery department of King Abdullah Hospital for last six months of 2019., a total of 84 patients were included. Of these, 51.2% (43 patients) were male, and 48.8% (41 patients) were female. The study found that the complication rate was higher among male patients, with 27.9% (12 male patients) experiencing complications related to appendectomy. In contrast, 14.6% (6 patients) of the female patients showed complications related to the surgical procedure (ALshahrani *et al.*, 2020)

A study done at Aga Khan University Hospital, Nairobi, Kenya, between January 2018 and December 2019, hundred sixty-seven patients underwent an appendectomy: 111 (66%) were male, and 56 (34%) were female. The age range of the patients was 6 to 82 years, with a mean age of 35±15.6 years. Among males, the mean age was 35.2±15.0 years, while among females, it was 34.9±16.8 years. The overall peak age was 30 to 40 years (male, 30-40 years; female, 20-40 years; male-to female ratio, 2:1) (Munguti *et al.*, 2022).

In a retrospective cross-sectional study conducted at the general surgery department of the reference health center in Bamako, Mali, data from 103 cases of Acute Appendicitis were collected between October 1, 2019, and October 30, 2021. The average age of the patients was 29 years, ranging from 13 to 61 years. The average length of hospitalization was 3.75 days, with a range of 2 to 15 days (Kanthé *et al.*, 2023)

In another study done at Adama, Ethiopia, from January 1, 2018, to December 31, 2019, the total number of patient charts reviewed was 431, with a 100% success rate. The mean age of the respondents was 28.28 years, with a standard deviation of 13.79. The age range of the respondents was 15 to 75 years. The majority of the patients, 241 (55.9%), were in the age group of 15 to 25 years. Males accounted for 252 (58.5%) of the study participants, and the majority of the respondents, 296 (68.7%), were from urban areas (Dagne and Abebaw, 2022)

An observational prospective cohort study was conducted at St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia; Males constituted the majority of the study population, accounting for 63.9%, with a male-to-female ratio of 1.8:1. The mean age was 27.62 ± 8.6 years, ranging from 18 to 70 years. Half of the study participants fell within the 18-25 age group. Regarding place of residence, the majority of patients (88.5%) came from the capital city, Addis Ababa (Gebre Selassie et al., 2021).

2.3.2 Management Outcome of Acute Appendicitis.

A retrospective observational study in Germany from 2010 to 2017 found that the mortality rate for uncomplicated appendicitis was 0.03% (95% CI [0.02; 0.04]; n = 23) in 2017, compared to 0.06% in 2010 (95% CI [0.05; 0.08]; n = 57). For complicated appendicitis, the mortality rate in 2017 was 0.42% (n = 95), down from 0.62% in 2010 (n = 127). Among cases of acute appendicitis with at least one surrogate parameter of a complicated clinical course, in-hospital mortality was 3.4% (n = 86) in 2017, compared to 5.4% (n = 136) in 2010. Complicated appendicitis was more likely to involve a complicated clinical course (2017: 8.9% vs. 0.6%; 2010: 9.3% vs. 0.7%) (Stöß *et al.*, 2021).

A retrospective review at Tehran Hospital, Iran, from 2004 to 2009, included 453 patients, of whom 13% (59) had complicated appendicitis. There were no in-hospital deaths, and 4.9% (22) had pathology findings consistent with a normal appendix and no other abnormalities. Forty-three percent (194) of the patients were female, with no significant difference in the proportion

of females in the complicated appendicitis group (45.8% vs. 42.4%; p=0.625) (Nouri *et al.*, 2017).

A prospective multicenter observational study was conducted in 116 surgical departments across 44 countries globally, spanning a 6-month period from April 1, 2016, to September 30, 2016. The findings revealed that the median length of hospital stay was 3 days (interquartile range, 2-5). Out of the total patients, 172 (4%) were discharged after a single day of hospitalization. A total of 3117 (3117/4097, 76.1%) patients were monitored for complications at 7 days after the intervention. Major complications occurred in 199 patients (4.6%). Out of the 3,117 patients, a total of 287 (9.2%) experienced complications within 7 days. Among these cases, there were 60 instances of intra-abdominal abscesses (1.9%), 194 surgical site infections (6.2%), 6 cases of paralytic ileus (0.2%), 6 occurrences of seromas (0.2%), 9 other abdominal complications (0.3%), and 12 other medical complications (0.4%). Out of the 4,097 patients, a total of 2,667 (65.1%) were monitored for complications at 30 days after the intervention. Among these patients, 88 (3.3%) experienced a complication. Within 30 days, the observed complications included intra-abdominal abscesses in 35 cases (1.3%), surgical site infections in 51 cases (1.9%), paralytic ileus in 2 cases (0.1%), other abdominal complications in 6 cases (0.2%), and other medical complications in 5 cases (0.2%). The overall mortality rate was 0.28% (Sartelli *et al.*, 2018).

In a retrospective review study conducted at King Abdulaziz University Hospital, a total of 341 patients who underwent appendicectomy were included. Among these patients, 212 (62.2%) were males. Histopathological findings confirmed true appendicitis in 302 cases, while the remaining 39 cases (11.44%) did not exhibit the same histopathological confirmation. Among cases of true appendicitis, the most common operative finding was purulent appendicitis in 59 cases (17.3%), followed by perforation in 53 cases (15.5%). After surgery, the majority of patients (98.8%) remained stable, except for 4 cases, all of which were male and had a BMI over 35. Nine patients (2.6%) experienced fever, and 12 cases (3.5%) developed surgical site infections (SSI) following the surgery (Jamal, 2021).

A study done at Aga Khan University Hospital, Nairobi, Kenya between January 2018 and December 2019 showed that the records of 180 patients diagnosed with acute appendicitis were identified. Among them, 173 patients underwent surgery, 4 received medical management without surgery for an appendicular phlegmon, and 3 were managed with image-guided percutaneous drainage of an abscess. Three patients with grade 5 appendicitis underwent

laparotomy and washout, while three other patients diagnosed with appendicular phlegmon underwent a right hemicolectomy. The hospital stay duration ranged from a minimum of 1 day for both groups, with a mean of 3±2.6 days for the open approach and 3.6±3.0 days for the laparoscopic approach (p=0.18) (Figure 3). The overall complication rate was 10.9% (17/173), with a higher rate observed in the open group compared to the laparoscopic group (12%, 12/99, vs. 7.3%, 5/68) (Table 2). Sixteen (16%) patients who underwent open appendectomy experienced delayed wound closure with an open wound (Munguti et al., 2022).

A descriptive retrospective study conducted at the General Surgical Divisions of University College Hospital Ibadan, Nigeria over a 10-year period (July 2007 to June 2016) revealed a total of 1081 appendectomy operations performed during that time. Among the available records, 619 (57.3%) patients were male, and 453 (41.9%) patients were female. The male-to-female ratio was 1.37:1. The age range of the patients who underwent appendectomy ranged from 12 years to 80 years, with the highest frequency observed in the third decade of life. Acute appendicitis was diagnosed based on a clinical assessment of symptoms, which included vague epigastric or periumbilical discomfort that shifted to the right lower quadrant. Most patients also experienced tenderness and/or rebound tenderness in the right lower quadrant. Additional diagnostic signs, including Rovsing's, psoas, and obturator signs, were observed to further confirm the diagnosis. The white blood cell count (WBC) ranged from 3.7 to 12.8 × 10^3/UL. Approximately 75% of appendices are retrocecal, while the remainder are either sub-cecal, pelvic, or para-ileal .this study demonstrates approximately 20% or a fifth of the patients had a ruptured appendix at surgery; while this may appear relatively high (Afuwape *et al.*, 2018).

A cross-sectional study was conducted at Debre Markos Referral Hospital in the Amhara Region of North West Ethiopia from 2018 to 2019. The study focused on patients admitted with acute abdomen, and a total of 303 patients were included. Among them, 169 patients (55.7%) underwent surgery for acute appendicitis based on clinical diagnosis. Of the patients who underwent surgery for acute appendicitis and met the eligibility criteria, 107 (63.3%) were male and 62 (36.7%) were female. The study also found that 69 patients (40.8%) were urban dwellers, while 100 patients (59.2%) were rural dwellers. their mean age was 24.6+ 11.8 SD years. All patients (100%) received preoperative intravenous (IV) antibiotics. The most frequently used abdominal incision was RLQ transverse incision (89.3%; n=151), followed by midline vertical incision (6.5%; n=11). Furthermore, the most common operative procedure performed was appendectomy (74.6%; n=126), followed by appendectomy with abscess

drainage (18.9%; n=32). The majority of patients, 112 (66.3%), had a hospital stay of ≤ three days (Afenigus et al., 2022).

The most common intraoperative finding was an inflamed/phlegmonous appendix (39.1%; n=66), followed by a perforated appendix (28.4%; n=48). Other intraoperative findings included appendicular abscess (24.9%; n=42), gangrenous appendix (5.9%; n=10), fecalith (1.2%; n=2), appendicular mass (0.6%; n=1), normal appendix (0.6%; n=1), and other findings such as inflammatory peritoneal fluid collection, ectopic kidney, cecal mass, and edematous pancreas (3%; n=5). The position of the appendix, in almost all patients, was retrocecal (99.4%; n=168). Out of the 169 patients who underwent appendectomy for acute appendicitis, 45 (26.6%) experienced postoperative complications, resulting in unfavorable treatment outcomes. The main postoperative complications observed were wound infection (13.6%; n=23), pneumonia (7.02%; n=12), intraperitoneal fluid collection (4.7%; n=8), and death (1.1%; n=2) (Afenigus et al., 2022).

An observational prospective study done in Menelik II Referral Hospital, Addis Ababa, Ethiopia stated that the most common abdominal incision used was the right lower quadrant transverse incision, chosen for 195 (85.9%) of the patients. The midline sub-umbilical vertical incision was the second most common, used for 17 (7.5%) of the patients. The selection of the incision type was based on the findings of the abdominal examination. Patients with localized tenderness at the right lower quadrant of the abdomen received the right lower quadrant transverse incision, while patients with diffuse abdominal tenderness received the midline sub-umbilical vertical incision. Simple/uncomplicated appendicitis made up the majority of cases, accounting for 169 (74.4%). On the other hand, 54 (23%) cases were classified as complicated. Most patients who sought medical attention within 48 hours of symptom onset had simple/uncomplicated appendicitis (Gebre Selassie et al., 2021).

Complications occurred in 9 (3.8%) of patients during the post-operative period, with the most frequent complication being superficial surgical site infection, observed in 4 cases. Relaparotomy was necessary for 2 patients (0.8%) due to intra-abdominal collection. Among them, one patient who underwent initial surgery for complicated acute appendicitis with generalized peritonitis experienced complete wound dehiscence and intra-abdominal collection in the postoperative period, ultimately resulting in death due to sepsis. Therefore, the mortality rate in this study was 0.4% (Gebre Selassie et al., 2021).

2.4 Conceptual Framework

For conceptual framework is the document that "explains, either graphically or in narrative form, the main things to be studied and the key factors, concepts, or variables; and the presumed relationships among them (Tamene, 2016).

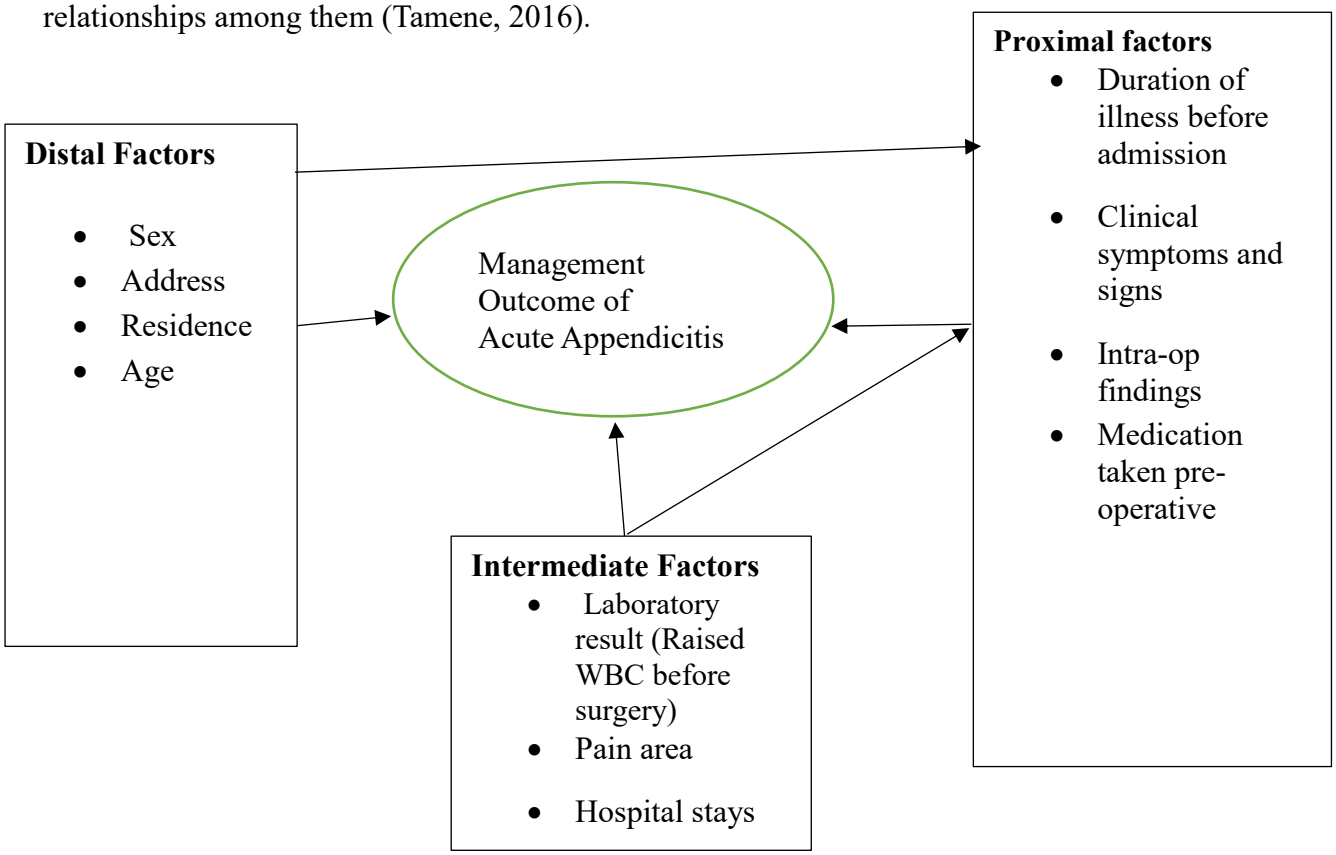

Figure 1 conceptual framework for management outcome of acute appendicitis

(Developed by Principal Investigator by reviewing different literature)

3. METHODS AND MATERIALS

3.1 Study Setting and Period

This study was conduct at Hiwot Fana comprehensive specialized Hospital from October 1-30, 2024. The Hiwot Fana Specialized Hospital is located in Harar, the oldest and most illustrious city in eastern Ethiopia. Harar is located 525 kilometers from Addis Ababa, the nation's capital. The region's two government hospitals are the Hiwot Fana Comprehensive Specialized Hospital and Jugal Regional Hospital. With catchment areas in the Eastern part of Ethiopia, including the majority of both Hararghe Zones, Harari regions, as well as some areas of the Somali regional state. HFCSH began as a referral hospital under Haramaya University administration in 2007. The hospital offers specialties in Emergency Medicine, Anesthesiology, Internal Medicine, Obstetrics and Gynecology, General Surgery and Orthopedics. Additionally, the hospital delivers treatments with different subspecialty level such as Radiology, Dermatology, Pathology, Oncology, Neurology, Neurosurgery, Plastic surgery, Pediatric surgery and ENT.

3.2. Study design

A descriptive cross-sectional study design was employed.

3.3 Population

3.3.1 Source population

The source population for this study were all adult patients who were underwent emergency surgery at Hiwot Fana comprehensive specialized Hospital from January 1, 2019 to December 31 ,2023

3.3.2 Study population

The study population for this study were all adult patients who were underwent surgery for acute Appendicitis at Hiwot Fana comprehensive specialized Hospital from January 1, 2019 to December 31 ,2023.

3.4 Inclusion and exclusion criteria

3.4.1 1nclusion criteria

All adult patients who were underwent surgery for acute appendicitis at Hiwot Fana comprehensive specialized Hospital from January 1, 2019 to December 31 ,2023.

3.4.2 exclusion criteria.

Medical charts that were lost

3.5 Sample size determination

Objective 1 The sample size was determined by a single population proportion formula using the prevalence of study conducted At Hawassa University Comprehensive Specialized Hospital for prevalence of acute appendicitis (15.2%) (Mosa, 2022) . With a margin of error of 0.05 and a z score for a 95% confidence interval of 1.96.

$$n = \frac{z^2 \, x \, pq}{d^2}$$

Where:

n= minimum sample size required for the study

Z= standard normal distribution (Z=1.96) with confidence interval of 95%

P= Prevalence of acute appendicitis (Mosa, 2022).

d =is a tolerable margin of error (d=0.05).

$$n = (1.96)^2 \, x \, 0.152x \frac{1-0.152}{(0.05)^2} \quad = \quad n = 3.8416 \, x \, 0.152x \frac{0.848}{0.0025} \quad = 198$$

Objective 3 The sample size was based on treatment outcome also determined by a single population proportion formula using the prevalence unfavorable treatment outcome of acute appendicitis of study conducted At Debre Markos Referral Hospital acute appendicitis which is 26.6% (Afenigus et al., 2022). With a margin of error of 0.05 and a z score for a 95% confidence interval of 1.96.

$$n = \frac{z^2 \, x \, pq}{d^2}$$

Where:

n= minimum sample size required for the study

Z= standard normal distribution (Z=1.96) with confidence interval of 95%

P= Prevalence unfavorable treatment of acute appendicitis (26.6%)

d =is a tolerable margin of error (d=0.05).

$$n = (1.96)^2 \, x \, 0.266x \frac{1-0.266}{(0.05)^2} \quad = \quad n = 3.8416 \, x \, 0.262x \frac{0.734}{0.05^2} \quad = 300$$

The third objectives give the largest sample size and after adding 10% non-response rate the final sample size was **330.**

3.6 Sampling procedure and Technique

Census type sampling techniques used after taking all medical record number who had emergency appendectomy as framework and reviewing the records of all patients who had emergency appendectomy, and it was retrieved and analyzed.

3.7 Data collection methods

3.7.1 Data collection instruments

A data collection tool was adopted from different studies (Omer, 2018, Hsu *et al.*, 2022, Mosa, 2022). Checklist consists sociodemographic characteristic, clinal features and management related factors.

3.7.2 Data collectors and supervisors

Four BSc holder nurses and one Master degree holder were used as data collectors and supervisor respectively. The data collectors were trained for one-day about the checklist on prevalence and treatment outcome of acute appendicitis.

3.7.3 Data collection procedure

Data were collected from medical charts after all medical record numbers taken from surgery registries book. Data were collected by using structured checklist that was pretested at jugal hospital one week prior to actual data collection period. During data collection period the trained data collectors surveyed patients charts and the assigning supervisor and principal investigator was following each activity of the data collector through checking consistency and completeness of chart.

3.8 Variables

3.8.1 Dependent variables

prevalence of acute appendicitis

Management outcome of acute appendicitis

3.8.2 Independent variables

Sociodemographic related factor: Age, Sex, Address, Residence,

Management and clinical related factors: Duration of illness**,** Clinical symptoms and signs, Pain area, intra-op findings, leukocytosis, hospital stays, medications taken pre-operatively

3.9 Operational definitions

Treatment outcome: The condition of the patient at discharge time either improved and had no operative complication (favorable outcome) or improved but developed one or more complications like surgical site infections or death (unfavorable outcome) (Bereded and Lohide, 2024).

Atypical presentation of acute appendicitis: Indigestion or Bowel irregularity or Diarrhea and Generalized malaise (Omer, 2018).

Classic presentation of acute appendicitis: Right lower quadrant (right iliac fossa) abdominal pain or Anorexia or Nausea and/or vomiting (Echevarria *et al.*, 2023).

Prevalence of acute appendicitis: is the occurrence of clinical presentation of acute appendicitis in different age group and sex (Bereded and Lohide, 2024) .

Complicated appendicitis: perforated and gangrenous appendicitis or appendicitis with abscess or phlegmon formation (Bereded and Lohide, 2024).

Length of Hospital stay: refers to the total bed days occupied by patient from the time of admission until discharge (Marfil-Garza *et al.*, 2018). prolonged length of stay (LOS) after surgery, defined as hospitalizations longer than or equal to the 75th percentile for LOS including the day of discharge (Martinez-Perez *et al.*, 2021).

Normal appendix: The vermiform appendix without any sign of inflammation, gangrene, abscess or perforation (Yilma and Gemechu, 2019)

Negative appendectomy: One, which is performed for a clinical diagnosis of acute appendicitis but where the appendix is found to be normal (Yilma and Gemechu, 2019).

3.10 Data quality control

To ensure data quality, properly designed data collection tools was used. One-day training was provided to data collectors and supervisor on the research objectives, data collection tools and procedures, and interview techniques. The principal investigator and one supervisor were overseen the data collection process and provide appropriate feedback on a daily basis. Before the actual data collection, the checklist was pretested on 5% of the total sample size at jugal hospital to check the contextual appropriateness. After the pretest, the checklist was revised.

3.11 Methods of data analysis

Data were collected by Kobo toolbox and transferred into SPSS version 27 for data cleaning, processing, analysis. Descriptive analysis such as frequencies percentage, mean, median, standard deviations were computed and explained by text, graphs and tables.

3.12 Ethical considerations

Ethical approval for the research proposal was obtained from the Institutional Health Research Ethical Review Committee (IHRERC) of Haramaya University College of Health and Medical Sciences with reference number IHRERC/243/2024. A formal letter was written to the HFCSH requesting permission to conduct the study. The data were collected after informed, written, voluntary and Signed consent obtained from hospital management and then reviewing the registration books using structured checklists. The obtained information from charts was carefully kept by the principal investigator.

4. RESULTS

Out of 1818 patients who were operated at emergency department of Hiwot Fana Comprehensive specialized Hospital from January 1,2019 to December 31 2023, 309 (16.99 %) patients underwent operative management for a clinical diagnosis of acute appendicitis.

4.1 Socio-demographic Characteristics

Males were accounted 76.05% of study participants. Median age of participants were 25 years with interquartile range between 20 and 30 years .55.34 % were ranged between 18 to 25 years old and about 80. 26% were from urban areas (Table 1).

Table 1 socio-demographic characteristic of study participants of acute appendicitis among patients admitted to Hiwot Fana Comprehensive Specialized Hospital from January 1, 2019 to December 31, 2023.

Variable	Category	Frequency	Percentage
Sex	Male	235	76.05
	Female	74	23.95
Age	18-25	171	55.34
	26-40	112	36.25
	>40	26	8.41
Residency	Urban	248	80.26
	Rural	61	19.74

4.2 Pattern of Clinical Features

Duration of Illness:

The median duration of illness was 24 hours with interquartile range of 24 to 72 hours. 50.16% of patients, duration of illness was ≤24 hours (**Error! Reference source not found.**).

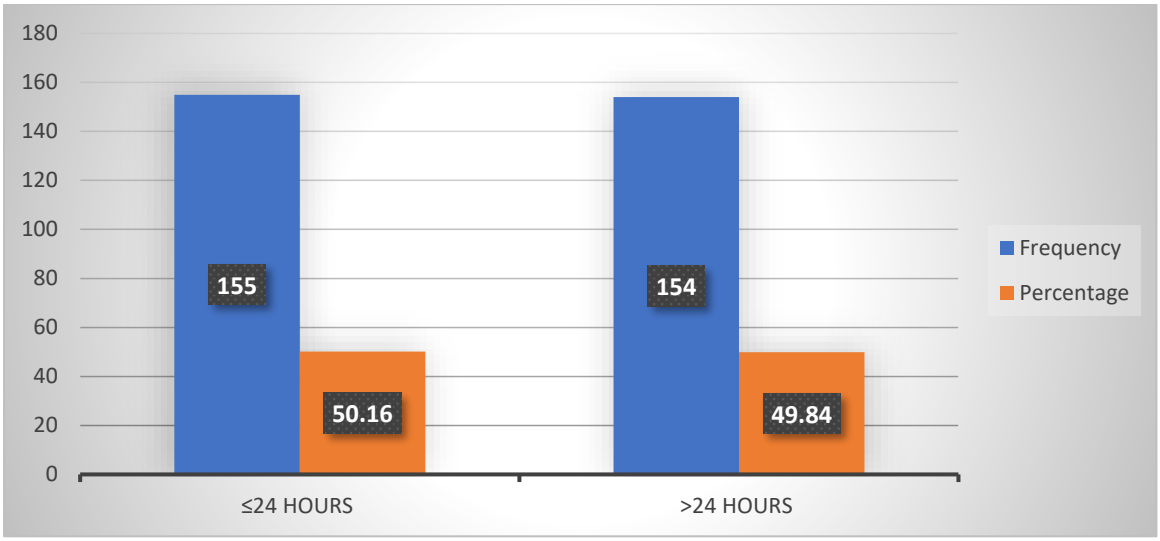

Figure 2 Durations of illness presented by patients operated for a clinical diagnosis of acute appendicitis at Hiwot Fana Comprehensive Specialized Hospital from January 1, 2019 to December 31, 2023.

Clinical presentation

The most common presentation was periumbilical pain shifting to RLQ 275 (89 %), followed by loss of appetite 258 (83.5%), vomiting 79.61 % and nausea 74.11 %. Fever and anorexia were other presenting symptoms 217 (70.23%), 7 (20.59 %) (Table 2), while the most Common physical sign was localized tenderness over right iliac fossa 259 (83.82 %), followed by psoas sign positive 32 (8.41%), Rovsing sign positive 25 (8.09%) and obturator sign positive 10 (3.24), unfortunately 257 (83.07%), 251 (81.33%) and 275 (89%) of patients physical examination for Rovsing sign, Psoas sign and Obturator sign were unknown, respectively.

Table 2 Clinical Symptoms of Acute Appendicitis Patients Operated at Hiwot Fana Comprehensive Specialized Hospital from January 1, 2019 to December 31, 2023.

Variables	Category	Frequency	Percentage
Periumbilical pain shifting to RLQ		275	89
Decreased/Loss of appetite	Yes	258	83.50
	No	51	16.5
Vomiting	Yes	246	79.61
	No	63	20.39
Nausea	Yes	229	74.11
	No	80	25.89
Fever	Yes	217	70.23
	No	92	29.77
Other features	anorexia	7	20.59
	constipation	7	20.59

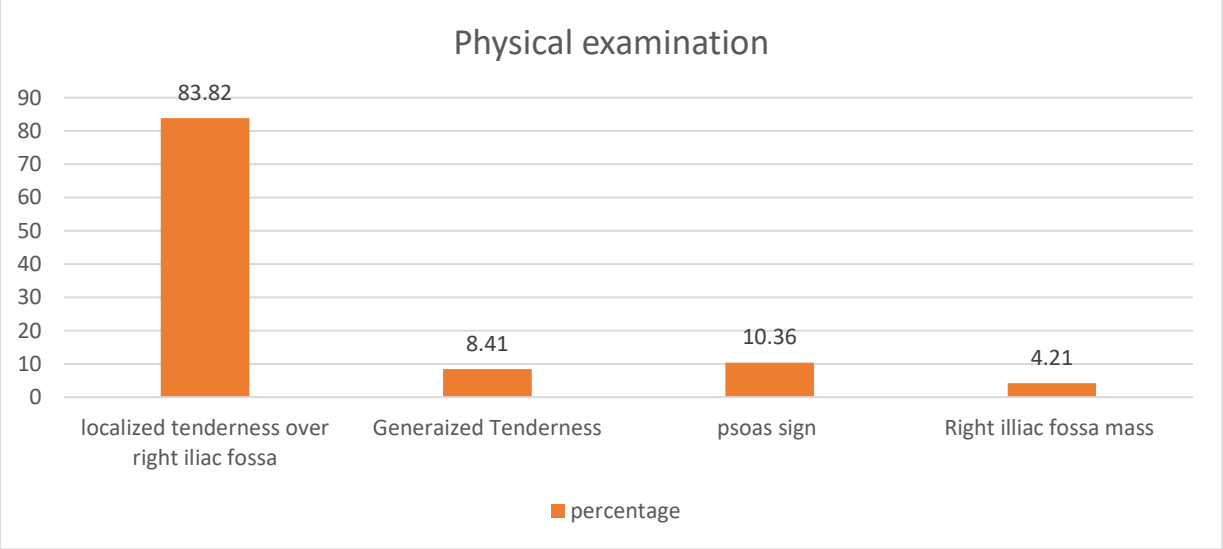

Figure 3 clinical signs of acute appendicitis patients operated at Hiwot Fana Comprehensive Specialized Hospital from January 1, 2019 to December 31, 2023.

4.3 Management Profile

Operative Findings

The most common abdominal incision was the right lower quadrant transverse incision (Lenz incision), performed in 305 patients (98.7%), followed by the midline sub-umbilical vertical incision in 4 patients (1.29%). The incision type was determined by the abdominal examination findings. A right lower quadrant transverse incision was performed for 257 (99.23%) patients with localized tenderness in that area, while a midline sub-umbilical vertical incision was used for those with diffuse abdominal tenderness.

The most common intra-operative findings were inflamed appendix with inflammatory peritoneal fluid 227 (73.46 %), Appendiceal abscess 19 (6.15%), Appendiceal Mass 12 (3.88%), Ruptured Appendix 9 (2.91 %), Gangrenous Appendix 4 (1.29 %) and normal Appendix was 2 (0.65%) (Figure 4).

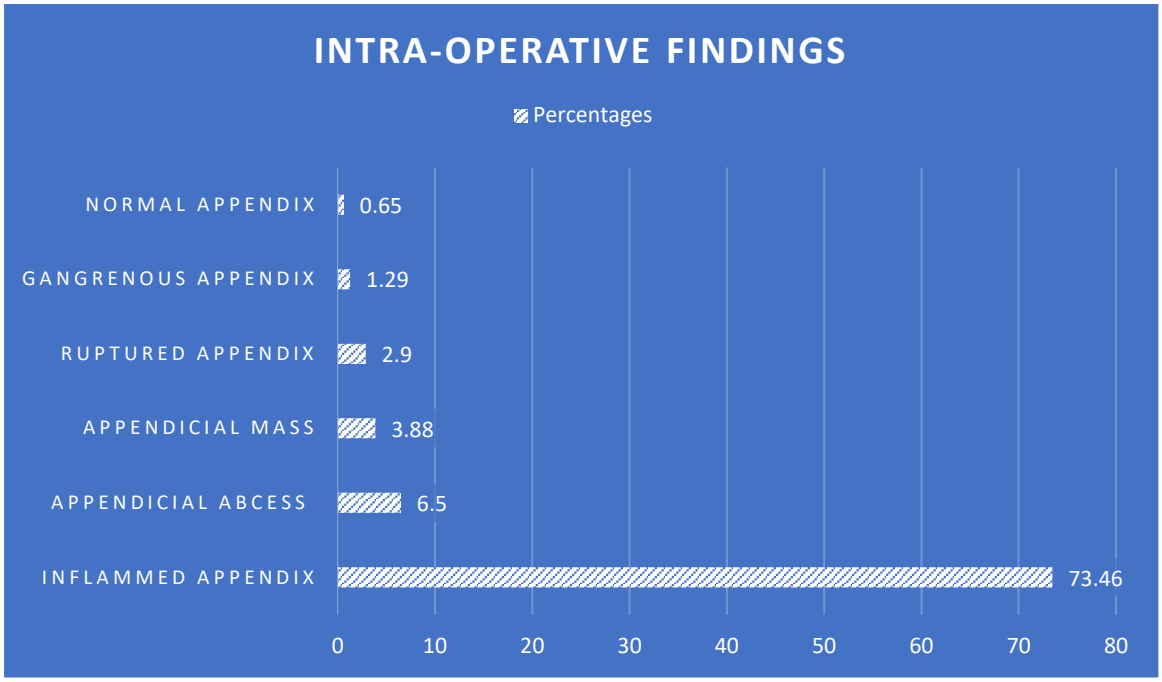

Figure 4 Intra-op findings of patients operated at Hiwot Fana Comprehensive Specialized Hospital from January 1, 2019 to December 31, 2023.

A total of 303 patients underwent appendectomy, while 26 patients had abscess drainage in addition to appendectomy. Four patients did not have an appendectomy, and two patients underwent a negative appendectomy (Table 3).

Table 3 Procedures performed among patients operated at Hiwot Fana Comprehensive Specialized Hospital from January 1, 2019 to December 31, 2023.

Variables	Frequency	Percentages
Appendectomy	303	98.06
Abscess Drainage	26	8.41
No Appendectomy	4	1.29
Negative/Prophylactic Appendectomy	2	0.64

Outcomes After Appendectomy

In this study, only 29 patients (9.36%) developed complications in the post-operative period. The most common was a superficial surgical site infection, affecting 28 patients (9.06%), while 1 patient developed a hospital-acquired infection (Figure 5). The median hospital stay for operated patients was 40 hours, with an interquartile range of 30.9 to 60.5 hours. Particularly for those that had surgical site infection 17 (60.71%) were stay at hospital for more than 2 days while the remain were stayed less than 2 days.

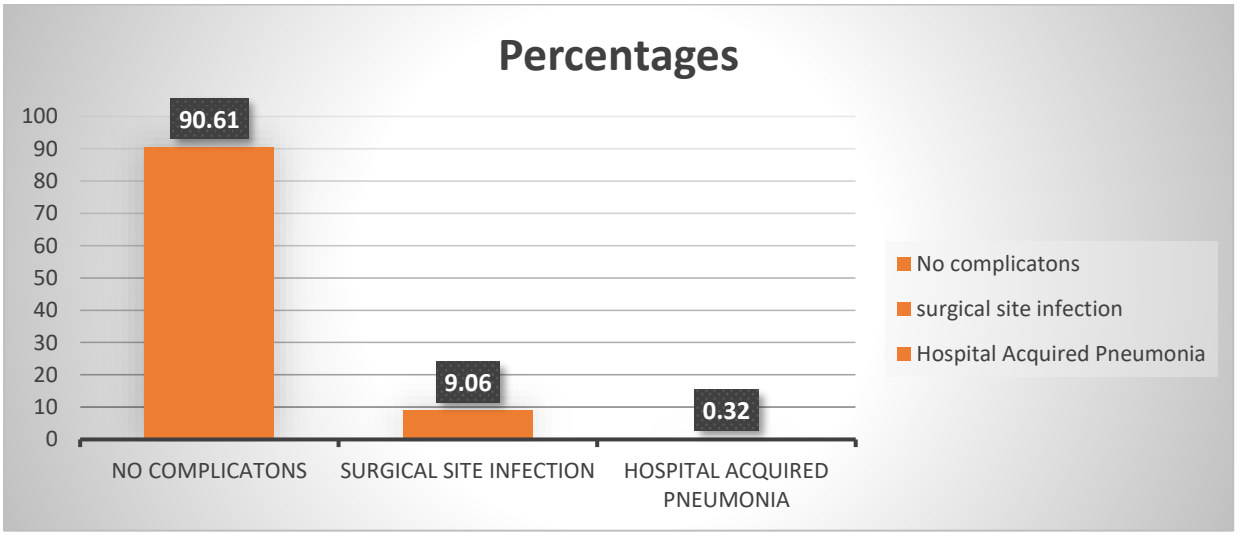

Figure 5 postoperative complications after appendectomy among patients operated at Hiwot Fana Comprehensive Specialized Hospital from January 1, 2019 to December 31, 2023.

5. DISCUSSION

In the current study the overall Prevalence of acute appendicitis is 16.99%, This finding was similar to other study in the country. For example Hawassa the prevalence of AA was 15.2% (Mosa, 2022). However, the finding of the current study was lower compared to the study conducted in at Mettu Karl Hospital, Ethiopia , (42.5%) (Yilma and Gemechu, 2019), Kenyatta National Hospital-Kenya,(34.4%) (Siachami, 2019).This might be due to the higher denominator of this study and to the fact they include pediatric age group to their study.

Acute appendicitis is primarily a condition affecting younger individuals, with the highest incidence observed in the second and third decades of life. This was also reflected in our study, where half of the patients were within the age group of 18 to 25 years. The same pattern was observed in other studies from a teaching Hospital in Addis Ababa (GEBRE SELASSIE ET AL., 2021) . The male predominance (76.05% with 95% CI 70.9 – 80.49%) has also been observed and in line with other study finding Hawassa (69.6%) , 76.06% in Jugal hospital(Omer, 2018) suggesting that the male is more likely prevalent among overall population of patients with acute appendicitis.

The residency pattern of patients with acute appendicitis in our study differs from that observed at Hawassa University Comprehensive Specialized where 165 (69.6%) of patients were from rural areas (Mosa, 2022). In contrast, a teaching hospital in Addis Ababa, Ethiopia, reported that the majority of patients (88.5%) were from urban areas, particularly from the capital (GEBRE SELASSIE ET AL., 2021) . In the current study, 280 participants (80.26%) were urban dwellers. The variation might due to different study setting.

The mean duration of illness was 2.27 days which is similar to other study finding of Hawassa 2-3 days (Mosa, 2022) , Aga Khan University Hospital, 2.98 days (Munguti et al., 2022) .Nearly all patients exhibited periumbilical pain that later shifted to the right lower quadrant (RLQ) accounted 88.99% (95% CI , 84.9 – 92%), consistent with findings from other studies conducted at Rural Tibet ,China ((97.8%) , Hawassa (96.6%) (Mosa, 2022),Addis Ababa (81.9%) (GEBRE SELASSIE ET AL., 2021) .The studies finding implies that most of the patients presented at hospital early.

The predominant incision utilized in this study was the right lower quadrant transverse incision (Lenz incision), applied in 305 patients (98.7%). This finding is comparable to other studies, such as one conducted at Debre Markos Referral Hospital in the Amhara region, which reported

an incidence of 89.3% (Afenigus et al., 2022a), Addis Ababa Teaching Hospital (85.9%) (GEBRE SELASSIE ET AL., 2021) .The finding suggesting that at presentation most of the patient comes with localized tenderness.

The most common intraoperative finding was inflamed appendix accounted 73.46 % with 95% CI (68.23% – 78.1%) .This goes in line with other studies done at Jugal hospital, (81.6%) with 95% CI (77.3% - 85.82%)(Omer, 2018) , Nasarawa state Nigeria with inflamed appendix (87.6%) (Oyeleke and SurajudeenOyeleke). This might be due to more than half of patient presented within 24 hours.

In this study, only 29 patients (9.36%) developed complications in the post-operative period. The most common was a superficial surgical site infection, affecting 28 patients (9.06%), while 1 patient developed a hospital-acquired infection. This is similar to study done in St. Paul's Hospital Millennium Medical College, Addis Ababa , (9.1 %) (Bereded and Lohide, 2024) .

The mortality rate in this study was found to be zero, which comparable with other studies conducted in the country. For instance, at Addis Ababa Teaching Hospital, the mortality rate was 0.4% (GEBRE SELASSIE ET AL., 2021) . This finding may reflect an improvement in health-seeking behavior within the community or enhancements in surgical care. The mean Hospital stay in this study was 2.03 ±1.33 Days which almost similar to other studies (GEBRE SELASSIE ET AL., 2021) .

6.CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

In this study the prevalence of acute appendicitis is 16.99 %. The most common clinical presentation, incision type and intra-operative findings was periumbilical pain shifting to RLQ, right lower quadrant transverse and inflamed appendix with inflammatory peritoneal fluid respectively. Only 29 patients (9.36%) developed complications in the post-operative period.

6.2 Recommendations

For Hiwot Fana Comprehensive Specialized Hospitals

I recommend the hospital administrative should have encourage the follow up system regarding Documentation in the medical chart of patients.

For clinicians

The clinicians need to record all the findings of patients on medical charts especially clinical finding such as physical examination because in this study, 251 (81.33%) and 275 (89%) of patient's physical examination for Rovsing sign, Psoas sign and Obturator sign were undocumented respectively.

To researchers

More comprehensive prospective cohort studies are recommended for future researchers to identify the reason why males are predominant than females because males are prevalent among patients with acute appendicitis. Again, further study also recommended through adding associated factors related to treatment outcome of acute appendicitis such as sex, age, duration of illness and their initial clinical presentation.

Strength and Limitation of the study

Strength

- It is the first of its kind to be done in hospital and it included all charts in the study period.
- Data were collected from the patient chart operated by different surgeons

Limitations

- since this study was from secondary data, there was incomplete documentation, including missing charts and the study limited on descriptive parts.

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8. ANNEXES

8.1: Information sheet and voluntary consent form for head of the Hiwot Fana hospital.

Introduction: Hello? My name is Dr Hamse Migane. I am a 4th year general surgery resident at HFCSH, College of Health and Medical Science of the Haramaya University. I am going to conduct research on Prevalence and Outcome of Acute Appendicitis. I kindly request you to give me your willingness to explain about this study.

The Study Title: Prevalence, Clinical feature and Outcome of acute Appendicitis among adult patients in HFCSH, Harar, Eastern Ethiopia: A Retrospective Cross-Sectional Study

The purpose of the Study: This study is aimed to provide better understanding of Prevalence, Clinical feature and Outcome of acute Appendicitis that help to choose the best treatment option for each patient.

Procedure and Duration: The study was carried out from October 1 – October 30, 2024 on adult patients with acute Appendicitis that was visited emergency by using medical record of the patients. The check list consists 22 questions and its takes 30 minute to fill.

Risk and Benefit: The risk of taking secondary data from the patients file is minimal, but only taking few minutes from your time. There would not be any direct payment for participating in this study but the findings from this research may reveal important information for the hospital, providers and for the patients.

Confidentiality: Patients information confidential was kept. There was no information that will identify you the participant in particular. The findings of this study were general for the study community and were not reflect anything particular persons. No reference will be made in oral or written reports that could link the participants to the research.

Rights: The hospital management have the right to terminate the study at any time if he/she considers something related to the study is wrong.

Contact Address: If you have any questions or inquiries about the study any time you can contact me by using my mobile phone number: +251-961535649 or E-mail: **Hmigane@gmail.com** and IHRERC office phone: 0254662011, P.O.BOX:235, Harar Ethiopia.

Declaration of Informed Voluntary Consent: I have read the participant information sheet. I have clearly understood the purpose of the research, the procedures, the risks and benefits, issues of confidentiality, the rights of participating and the contact address for any queries. I

have been given the opportunity to ask questions for things that may have been unclear. I was informed that participants have the right to withdraw from the study at any time or not to answer any question that they do not want. I am also informed that the Hospital has the right to stop this study from being conducted if any misdeeds and unethical procedures are observed during the data collection process in the Hospital's premises. Therefore, I declare my voluntary consent on behalf of Hiwot Fana Hospital management to allow this study to be conducted in the Hospital with my initials (signature).

Name and Signature of Head of the Hospital: _____Date _____

Name and Signature of the PI: _____ Date _____

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8.2 Checklist

Checklist for research on the prevalence, clinical features and outcome of treatment acute Appendicitis patients at Hiwot Fana Comprehensive Specialized Hospital, Eastern Ethiopia,2024.

Part I: Demographic Questions

No.	Questions	Category
Code number		----------
1	Admission date	date ----/-----/------ D/M/Y Time ------/------ in hour/minute
2	Age in years	
3	Sex	1. Male 2. Female
4	Residency	1. Town 2. Rural

Part II: Clinical Profile Questions

5	Duration of illness prior to admission in days	____
6	Abdominal pain location	1. Periumbilical pain shifting to the RLQ 2. RLQ 3. Unspecified sites
7	Decreased or loss of appetite	1. Yes 2. No
8	Vomiting	1. Yes 2. No
9	Nausea	1. Yes 2. No
10	Fever	1. Yes 2. No
11	Other features (please specify)	

12 Associated symptoms		1. Diarrhea 2. Constipation 3. Dysuria 4. Hematuria 5. Other specified
13	. Generalized abdominal	1. Yes 2. No

	tenderness	
	. localized tenderness over the right iliac fossa	1. Yes 2. No
	. Rovsing sign	1. Yes 2. No
	. Psoas sign	1. Yes 2. No
	. Obturator sign	1. Yes 2. No
14	Right iliac fossa mass	1. Yes 2. No
15	Raised white blood cells count (> 10,000 cells/mm3)	1. Yes 2. No
16	peritonitis (pre-operative) Localized Generalized	 1. Yes 2. No 1. Yes 2. No
17	**Type of incision** 1.Gridirone Incision 2. Lanz incision (Rocky Davis) 3. midline Incision	 1. Yes 2. No 1. Yes 2. No 1. Yes 2. No
18	Medication taken prior to admission to the hospital	1. Yes 2. No

part III: Management Profile Questions

19	intraoperative findings	1. Inflamed appendix 2. Gangrenous appendix 3. Perforated/ Ruptured appendix 4. Appendiceal abscess 5. Normal appendix 6. Appendiceal mass 7. Inflammatory peritoneal fluid 8. Peritonitis (Localized, Generalized) 9. Non appendiceal pus 10.Others specified
20	Procedure performed	1. Appendectomy 2. Abscess drainage 3. Negative /Prophylactic appendectomy 4. Negative laparotomy 5. Peritoneal lavage and appendectomy
21	Post-operative complications	1. Surgical wound infection / Wound dehiscence 2. Fistula
22	Discharge date	date ----/-----/------ D/M/Y Time ------/------ in hour/minute

8.3: Curriculum Vitae

PERSONAL DATA

Name: Dr. Hamse Migane Rayale

Marital Status: Married

Date of Birth: 27/Sept/1991

Gender: Male

Country of Origin: Somaliland

Present Nationality: Somali

Address: Telephone Mobile: +251915586499

Email: Hmigane@gmail.com

Education Background

University: Degree of Doctor of Medicine, Amoud University Borama, Somaliland, September 2011 – August 2018
Secondary school: SOS, HG, Sheikh, Somaliland September 2007 to May 2011
Elementary school: Guryo-Samo, Hargeisa, September 1999 to May 2007

Work Experience

Medical Intern: Borama Regional hospital. August 2018 to July 2019

General physician: Allale Hospital, Borama August 2019 to January 2020

Medical Doctor: Gargaar Hospital, Buhoodle from February 2020 to January 2021

General Surgery Resident, Haramaya University, January 2021 till now

Teaching Experience

Sept 2018-2019

Amoud College of Health Sciences, ACHS Borama, Somaliland Tutor to Medical Students

• Tutor to medical students for Community activity program

August 2019 - September 2020

Admas University, college of Health Sciences Borama, Somaliland Tutor to Medical Students

• Tutor for third-year Nursing students in their Health Assessment/Bedside technique course and in their preparation for ward exam

Activities and Services

Sept 2018 - July 2019

Community outreach services, ACHS Borama, Somaliland

Co-president

- A student-run community outreach effort of the School of Medicine. This program offers students and faculty the opportunity to practice their clinical skills while providing screening service and health education to underserved urban communities. Services include a free weekly clinic and referrals to Hospitals.

professional memberships

Somali Medical Association (SMA) 2020 - present

academic awards

Aug 2018 Outstanding contribution in supervising Med. students in community outreach activities, research and development center (RDC) office, ACHS

2012 - 2014 ACHS trustee academic scholarship Competitive academic scholarship

Key skills

Communication skills

Training

Organized and detailed

Microsoft

Hobbies, Interests and Activities

cycling, reading, outdoor activities, football, fitness exercises

languages

Somali:	fluent
English:	Excellent
Arabic:	Proficient
Amharic:	Proficient

REFERENCES

Prof. Dr. Said A.Walhad,
Principle at college of health sciences, ACHS Amoud University
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