

2022-08-07

Treatment out come and Associated Factors of Bowel Obstruction Among Patients Treated Surgically in Debre Tabor Comprehensive Specalized Hospital, North West Ethiopia, 2022.

Getiye, Mihiretie

<http://ir.bdu.edu.et/handle/123456789/14963>

Downloaded from DSpace Repository, DSpace Institution's institutional repository



BAHIR DAR UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCE

DEPARTMENT OF Integrated Emergency Surgery
and Obstetrics

Treatment out come and Associated Factors of Bowel Obstruction Among Patients Treated Surgically in Debre Tabor Comprehensive Specialized Hospital, North West Ethiopia, 2022.

By: Getiye Mihiretie (Bsc)

A RESERCH PAPER SUBMITTED TO BAHIR DAR UNIVERSITY,
COLLEGE OF MEDICINE AND HEALTH SCIENCES, DEPARTMENT OF
INTEGRATED EMERGENCY SURGERY AND OBSTETRICS IN
PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE
OF MASTERS IN INTEGRATED EMERGENCY SURGERY AND
OBSTETRICS.

AUGUST, 2022

BAHIR DAR, ETHIOPIA

Candidate's Declaration form

This is to certify that Operative treatment out comes of bowel obstruction and associated factors in Debre Tabor comprehensive specialized Hospital,2022,Thesis report submitted in partial fulfillment of the requirements for the degree of masters of science in integrated emergency surgery and obstetrics of Department of integrated emergency surgery and obstetrics, Bahir Dar university, is a record of original work carried out by me and has never been submitted to this or any other health institution to get any other degree and certificates. The articles are properly cited, results are accordingly discussed.

Advisor's approval form

This is to certify that I have supervised, read, and evaluated this thesis report titled Operative treatment out comes of bowel obstruction and associated factors in Debre Tabor comprehensive specialized Hospital, 2021, submitted by Getiye Mihiretie in partial fulfillment of the requirements for the degree of masters of science in integrated emergency surgery and obstetrics of Department of integrated emergency surgery and obstetrics, Bahir Dar university, is Prepared under my guidance. I recommend the thesis Report be submitted for Desertion.

1,.....

Advisor's name

Signature

Date

2,.....

Advisor's name

Signature

Date

Approval of Thesis report desertion result

We here by certify that we have examined this thesis report entitled “Operative treatment out comes of bowel obstruction and associated factors in Debre Tabor comprehensive specialized Hospital, 2021, by Getiye Mihiretie. We recommend and approve the thesis report a degree of“ _____”

Board of Examiners

1,.....

External examiner's name

Signature

Date

2,.....

Internal examiner's name

Signature

Date

3,.....

Chairperson's name

Signature

Date

Acknowledgment

I would like to express my deepest gratitude to my divisors Mr. Yosef Wasihun and Dr. Abenzer Mekonnen for their indispensable comments and suggestions in the preparation of this research proposal.

I am greatly indebted to Department of Integrated Emergency Surgery and Obstetrics of Bahir Dar University College of medicine and Health science for giving me the opportunity to conduct this research.

I would also like to thank all staffs of Debre Tabor compressive Specialized Hospital for providing me relevant information, allowed me to collect the data about surgically managed bowel obstruction from registered document and helped me during the data collection period.

Abstract

Background: Bowel obstruction is a global public health problem consuming much in terms of surgical services which varies between regions of the world. It is a common surgical emergency and a significant health problem in Ethiopia. Several factors contribute to poor management outcomes in the case of Bowel obstruction.

Objective: The aim of this study was to assess the operative treatment outcomes of bowel obstruction and associated factors in Debre Tabor comprehensive specialized hospital north west Ethiopia 2022.

Methods: Institution based cross sectional study with patients' chart review was conducted among 400 patients operatively managed for bowel obstruction, from April 08 to June 30, 2022. The charts of patients were selected using a systematic random sampling technique. Checklist was used to collect the data from the patients' medical records. The data were analyzed using SPSS version 25. Frequencies with percentages were used to present the data. Bivariable and multivariable logistic regression analysis was used to identify factors associated with dependent variable. Factors at $P < 0.05$ were declared statically significant.

Result: 79% patients have Good surgical management outcomes of Bowel obstruction. History of chronic illness (AOR :0.184, 95 CI(0.076-0.445)), Abdominal tenderness (AOR: 0.207, 95 CI(0.086-0.497)), preoperative diagnosis (AOR:2.13, 95CI(1.33-3.41)), postoperative vital sign (AOR:0.108, 95 CI (0.28-0.413)), intraoperative blood transfusion (AOR: 0.344, 95 CI (0.134-0.883)), and intraoperative procedure (AOR :0.369, 95 CI(0.177-0.771)) were significantly associated.

Conclusion: In this study, good surgical management outcomes of bowel obstruction are lower related to study done University of Gondar comprehensive specialized Hospital. Thus, designing a strategy addressing the significantly associated factors could help to decrease poor surgical management outcome.

ABBREVIATIONS AND ACRONYMS

IESO..... Integrated emergency surgery and obstetrics

DTCSH.... Debre Tabor comprehensive specialized hospital

SBO..... Small bowel obstruction

LBO..... Large bowel obstruction

AOR..... Adjusted Odds Ratio

CI..... Confidence Interval

P Value....Probability value

BO..... Bowel obstruction

DD..... De-rotation and Decompression

MBO.... Mechanical Bowel Obstruction

RAResection and Anastomosis

SOP..... standard operating procedure

PI..... Principal investigator

SV..... Sigmoid Volvulus

Table of Contents

Acknowledgment	4
Abstract	5
ABBREVIATIONS AND ACRONYMS	6
List of tables.....	10
List of Figures	11
1. Introduction.....	12
1.1. Background	12
1.2. Statement of the problem	12
1.3. Significance of the study	13
2. Literature reviews	14
2.1. Treatment outcomes	14
2.2. Associated factors	19
2.2.1. Socio-demographic factors	19
2.2.2. Preoperative clinical characteristics	19
2.2.3. Intraoperative clinical characteristics	20
2.2.4. Postoperative characteristics.....	21
3. Conceptual Frame work.....	22
4. Objectives	22
4.1. General objective.....	23
4.2. Specific objectives.....	23
5. Methodology	24
5.1. Study area and period	24

5.2 Study design	24
5.3 Source population.....	24
5.4. Study population	25
5.5 Eligibility Criteria	25
5.5.1. Inclusion Criteria	25
5.5.2 .Exclusion Criteria.....	25
5.6. Sample size and Sampling technique	25
5.6.1. Sample	25
5.6.2. Sampling.....	26
5.7. Variables.....	27
5.7.1Dependentvariable	27
5.7.2 Independent variables	27
5.8. Operational definitions.....	27
5.9. Data collection instrument and data collection procedures.....	28
5.10. Data entry, processing and analysis	28
5.11. Data quality assurance.....	29
5.12. Ethical clearance	29
6. Result	29
6.1. Socio demographic Characteristics	29
6.2. Preoperative Clinical Characteristics	31
6.3. Intraoperative Clinical Characteristics	35
6.4. Postoperative Clinical Characteristics.....	36
6.5. Treatment outcome.....	38
6.6 Factors associated	39
7. Discussion	41

7.1. Surgical Management Outcome:	42
8. Conclusions.....	45
9. Recommendation	46
10. Limitation.....	47
12 Appendixes	50
11. Refferences	55

List of tables

Table 1: Sample size determined using the second objective	26
Table 2: Independent Variables	27
Table 3: Socio-Demographic characteristics of Bowel Obstruction (N=400).....	30
Table 4: Preoperative characteristics of Bowel obstruction patients at Debre tabor comprehensive specialized hospital, Ethiopia (N=400).....	31
Table 5:: Intraoperative characteristics of Bowel obstruction patients at Debre tabor comprehensive specialized hospital, Ethiopia(N=400).....	35
Table 6: Postoperative clinical characteristics of Bowel obstruction patients at Debre tabor comprehensive specialized hospital, Ethiopia (N=400).....	37
Table 7 Treatment outcome of Bowel obstruction patients at Debre tabor comprehensive specialized hospital, Ethiopia (N=400).....	38

List of figures

Figure 1: This Framework is compiled with Reference from Articles Used in the Literature. 22

1. Introduction

1.1. Background

Bowel obstruction constitutes about 10 percent of all non-trauma surgical emergencies. Adhesions, neoplasm, hernia and volvulus were the leading causes. Morbidity and mortality remains high due to intestinal strangulation. Concerted efforts directed towards adhesion prevention, early elective hernia repair, prompt screening and cancer treatments will therefore likely reduce the morbidity and mortality of bowel obstruction(1).

Intestinal obstruction has been the leading cause of acute abdomen in several African countries whereas acute appendicitis is the most frequently seen cause in the developed world(2). The leading causes of intestinal obstruction in Africans have mostly been hernia and volvulus whereas adhesions are most frequent in the developed world(3).

Regardless of its underlying causes, a surgery for Bowel obstruction sometimes led to a variety of postoperative complications such as surgical site infections, wound Separation, pneumonia, and sepsis which are not rare especially after an emergency surgery for bowel obstruction and even death as the poor outcome of that surgical management(4, 5). Outcome of operative treatment can be influenced by several patient related and clinical-related factors(6, 7).

Little is known in Ethiopia about this issue, and there are no data available on my particular study area; therefore, the aim of this study was to assess the operative treatment outcomes of Bowel obstruction and its associated factors at a Debre-Tabor comprehensive specialized hospital in northwest Ethiopia (8).

1.2. Statement of the problem

Bowel obstruction is a global problem consuming much in terms of surgical services. It is a common surgical emergency and a significant health problem in Ethiopia(9, 10).

In Debre Tabor comprehensive specialized Hospital Bowel obstruction is one of acute abdominal conditions among patients who require immediate surgical intervention but it is not determined what factors contribute to treatment outcomes. All patients after the operative management for bowel obstruction are followed until improvement and discharged home. However, Treatment outcomes and associated factors are not studied in the study area. Information on the Operative treatment outcomes of bowel obstruction and associated factors would enable better preparation

for prevention of complications as well as reduction of morbidity, mortality and cost of healthcare. Designing a strategy for addressing factors affecting Operative Treatment outcomes of bowel obstruction which will be determined would be helpful to further increase the likelihood of good surgical management outcome for the patients attending hospitals(8).

Despite of modern surgery is being practiced; the mortality rate following acute abdominal surgical emergencies is still high worldwide. It is always advantageous to do an early surgery than a late surgery, so knowing pattern and causes of diseases will help to make diagnosis early, then starting treatment accordingly and this will decrease delays in management and related complications. This study is believed have epidemiological and clinical benefits and would also serve as a base for other studies(3).

Mortality and morbidity associated with the disease and its management outcomes are somehow different from continent to continent, from country to country and from place to place. With only a few studies conducted in north central Ethiopia there is a paucity of research about management outcome of bowel obstruction in Ethiopia, particularly in the south Gondar. Furthermore, there is no recently published literature that has explored bowel obstruction in Debre Tabor comprehensive specialized hospital. Thus, this study was conducted to fill this information gap and generate information about Operative Treatment outcome of bowel obstruction and associated factor(3, 8)

1.3. Significance of the study

This study helps to indicate the operative Treatment out comes of bowel obstruction and associated factors in the study area. The study is going to be used as base-line for those who need to conduct similar study. The result of the study helps the local Health institutions: Zonal Health departments and regional Health Bureaus as well as policy makers for proper planning, implementation, and evaluation of health service activities as well as policy amendment. It also helps the local health workers as baseline information to provide quality Health service for better follow up and treatment for those patients with Bowel obstruction. It also provides information for researchers about operative Treatment outcomes of bowel obstruction and associated factors that are to be conducted on similar health institutions around selected countries in the world including Ethiopia.

2. Literature reviews

2.1. Treatment outcomes

Acute abdomen is a medical emergency, in which there is onset of sudden and severe pain in the abdomen with accompanying signs and symptoms that involves abdominal area(9).

The causes of the acute abdomen are several and their relative incidence varies in different populations(11).

Worldwide, appendicitis, bowel obstructions, incarcerated or strangulated hernias, volvulus, and acute biliary pathology remain the most common causes of the acute abdomen in adults(12). The most common symptoms are abdominal pain and vomiting whereas tenderness and guarding are the most frequent clinical signs. It is common surgical emergency accompanied with high morbidity and mortality if not managed properly(10).

Bowel obstruction vexed medical practitioners as long ago as 350 B.C .and it continues to do so today as Presentation, Diagnosis, Decision making for treatment options and predicting possible outcomes is not straight forward(13). The majority of patients had good treatment outcomes of Bowel obstruction and the proportion of patients with poor outcomes was however considerable (8).

The major predictors of management outcome of intestinal obstruction were: duration of illness before surgical intervention, intraoperative findings, intraoperative procedures, and length of hospital stay(11). Study shows 83.3 percent of 227 patients have favorable surgical management outcomes of BO which was defined as the absence of all types of postoperative complications and overall success rate of the surgery is 95.6 percent with 217 patients discharged on improvement(8). Among 299 patients who underwent surgery for acute abdomen 39.1 percent were bowel obstruction cases second to acute appendicitis .Regarding the outcome of Patient who underwent Surgery for acute abdomen 94 percent were improved(14). Bowel obstruction may be partial or complete, simple or complicated. Partial obstruction allows some liquid contents and gas to pass through the point of obstruction, whereas complete obstruction impedes passage of bowel contents. Simple obstruction enhances good out come as the involved segment of bowel is not deprived of nutrients(15). There is a study of adult patients with acute large bowel obstruction over a 6-year period. The diagnosis of adult obstruction was made from a

history of constipation, abdominal distension, abdominal pain, nausea, and radiography features of large bowel obstruction. Laparotomy was performed on patients with contraindications for deflation after resuscitation. If the obstruction involved the right colon resection and primary ileo-colic anastomosis was performed, while for a lesion in the left colon a resection and primary colo-colic anastomosis was performed after intraoperative judgment. If the obstructing lesions were thought to be malignant and too advanced to merit any excisional or the patient's general condition was too poor to withstand resection, a biopsy was taken and a decompress or by pass procedure given pending the confirmation of the diagnosis and this procedure enhanced good treatment outcomes like lengthening life expectancy(16). Large bowel obstruction is most often the result of colorectal malignancies and the lesions usually arise in the recto sigmoid area. Death due to acute intestinal obstruction is decreasing with better understanding of pathophysiology, improvement in diagnostic techniques, fluid and electrolyte correction ,much potent anti-microbial and knowledge of intensive care(17). Intestinal obstruction contributed to 6.5 percent of all surgical admissions. It was nearly twice more common in males. 43 percent patients presented with features of acute intestinal obstruction in comparison to 57 percent who presented with features of sub-acute intestinal obstruction. Most common cause observed was obstruction due to Intra-abdominal adhesion followed by abdominal tuberculosis 48 and 29 percent respectively. Features of intestinal obstruction resolved in 60 percent patients with conservative management. Adhesion's, abdominal tuberculosis and malignancy counted for majority of patients with sub-acute obstruction. Emergency surgery was done in 32 percent of patients and 36.5 percent of patients were discharged none operatively. After successful expectant management was done in 24 percent of patients planned surgery helps for good treatment outcomes(18). Good treatment outcomes of bowel obstruction who underwent for Operative Treatment improves the economic impact of the disease on an individual as it shortens length of hospital stay ,Decreases health cost of post-operative complications, allowing client to go back for work earlier(19).

Even though majority of cases managed surgically for intestinal obstruction end up with good treatment out comes there are cases who will proceed with poor treatment out comes by facing either postoperative complications like surgical site infection, anastomotic breakdown, facial Dehiscence, Intra-abdominal collection, Adhesion, or Death(20).

From a study done at university of Gondar comprehensive specialized hospital 16.7 percent of all cases have poor surgical treatment outcomes of bowel obstruction, which was characterized by the presence of the recorded postoperative complications or death at the health care facility. The finding on this poor outcome rate was in line with a study conducted in Debre Berhan Referral Hospital in northeastern Ethiopia, but it is lower than the studies from eastern and southeastern Ethiopia, such as 32.8 percent in Gelemso General Hospital and 24.6 percent in Adama Hospital, and also lower than the findings from other countries, such as 24.6 percent in India and 24.2 percent in Uganda. The possible reason for the difference might be due to variation in the distribution of the clinical and socio demographic characteristics of the study participants, the Health institution internal setups itself, and the overall infrastructures of the study area, as well as may depend on the operational definitions used between the literature (8, 11).

The magnitude of poor surgical outcome of intestinal obstruction was 21.3 percent for patients enrolled into an investigation .This magnitude of poor surgical outcome was high. Age, late presentation of illness, and gangrenous bowel obstructions were significantly associated with poor outcomes. So, concern should be given in early detection and follow up of patients who presented late and older patients. Bowel resection and anastomosis was the commonest intraoperative procedure done and is associated with postoperative complications(21). Four point five percent inpatient postoperative deaths were documented, among a total of 227 analyzed cases who were engaged for the surgical management of bowel obstruction manage at tertiary health care level in north western Ethiopia(8).

There were 299 patients of which 67.2 percent were males and 32.8 percent were females. About 58.2 percent of patients visited the hospital after 2 days of onset of symptoms. Abdominal pain and vomiting were the most common complaints(22). Acute appendicitis was the most common cause accounting for 49.2 percent of the patients, followed by acute intestinal obstruction 39.1percent.Regarding the outcome of patients who had acute abdominal Surgery 31.4 percent had developed postoperative complications. Wound infection was the most frequently identified complication in 15.7 percent followed by sepsis in 8 percent and pneumonia in 4.7 percent. Overall, 5.4 percent of patients admitted with acute abdomen died .Regarding the outcome of Patient who underwent Surgery for acute abdomen 5.4 percent died. Acute appendicitis,

intestinal Obstruction, and perforated peptic ulcer disease were the main causes of death among patients surgically treated for acute abdomen respectively(14). If the patient developed one or more postoperative complications including wound infection, facial Dehiscence, anastomotic leakage, developed septic shock, pelvic collection and pneumonia or death this was considered poor outcome of bowel obstruction(11). Wound infection and septicemia were the most common postoperative complications. The overall case fatality rate was 16 percent. Acute appendicitis was the common cause for acute abdomen. The overall case fatality rate of acute abdomen found was unacceptably high. Early diagnosis, adequate preoperative and postoperative care was mandatory(12).

Small bowel obstruction was more prevalent than large bowel obstruction. Intussusception and sigmoid volvulus were the leading causes of small and large bowel obstruction. Laparotomy was the most common methods of intestinal obstruction management. Wound infection in the affected area should be improved because it is the most common postoperative complication. This can be decreased by appropriate surgical technique and wound care with sterile techniques (8, 11). Acute intestinal obstruction was the diagnosis in 9.87percent of all patients admitted and the main cause of obstruction was obstructed hernia followed by malignancy with adhesion's coming third. Among those who underwent surgery Postoperative complications occurred in 95 patients and of these, 38 patients had a single complication and the rest, more than one. The main complications were wound infection, basal atelectasis, burst abdomen and prolonged ileus. The mortality rate was 7.35 percent .The highest mortality occurred in those with intestinal tuberculosis .the pattern of intestinal obstruction differs from the Western world with obstructed hernias being the most important cause and also emphasizes the fact that intestinal tuberculosis assumes a prominent role. It also highlights the necessity of using universal precautions because of the ever increasing number of HIV patients in those with intestinal obstruction(23).

Most frequently seen complication was wound site collection followed by respiratory tract infections. Total mortality in a study was 12.6 percent of which 41 percent was post-operative mortality and 59 percent mortality seen in patients who dies during conservative management. A watchful expectant management can be tried in patients with prior operative history and those with history of tuberculosis(18). The common cause of mechanical bowel obstruction was benign diseases, such as adhesion's, and sigmoid torsion while 20 percent of causes were

malignancies, like colorectal and small bowel tumors. The 56.8 percent of the patients underwent surgery in the first 24 hours. Intra-operatively, severe ischemic features in the bowel were determined in 48 percent of the patients, while perforation in 2.7 percent and necrosis in 7.4 percent. Resection procedures were performed in 60.1 percent, while 37.8 percent of the patients underwent Adhesiolysis and, Morbidity rate was 41.9 percent, and 12.8percent of the patients had died(24). Discharge rates were maximum in patients of adhesion and minimum in patients of volvulus. It had been observed that early diagnosis, adequate preoperative hydration, prompt investigations and early operative intervention improves survival in patients of intestinal obstruction. If preoperative preparation is improved and anesthetic management is more skillful, the mortality from abdominal exploration should approach to minim(25).

Sigmoid volvulus is relatively rare in our community. It commonly affects males particularly the old. Most of the patients presented acutely, requiring immediate resuscitation and surgical approach. In viable bowel, primary resection and anastomosis of the twisted sigmoid is feasible as it may not adversely affect outcome. Nevertheless colostomy should be considered if the bowel is gangrenous or perforated. Though the disease carries a high mortality, most of the patient who die are either older or have co-morbid conditions(26). Self-expanding metallic stent placement is a viable alternative to multistage surgery, providing patients with benefits as a bridge-to-surgery and relief of obstruction in a palliative context, with minimal differences in clinical success and safety compared to multistage surgery(27). In Cohort study including 345 patients with Mechanical Large Bowel obstruction and if resection is not part of the treatment plan, stenting is safe and improves the efficiency of care with obvious quality-of-life benefits. It should be offered at experienced centers, and patients should be counseled regarding increased risk of subsequent stenting within1year (28). Colonic volvulus is a rare cause of bowel obstruction in the United States and is associated with high mortality rates. Colon could be obstructed at its different parts alone or in combination with small bowel in case it needs management of both small bowel and large bowel. Colonic volvulus and sigmoid volvulus affect different populations and the incidence of colonic volvulus is on the rise. The presence of bowel gangrene and coagulopathy strongly predicts mortality, suggesting that prompt diagnosis and management are essential(29).

2.2. Associated factors

Three factors such as, co morbidity, and length of hospital stay were significantly associated with the surgical management outcome of bowel obstruction unlike other factors like age, Sex, Residency, marital status, educational status, Preoperative diagnosis, intraoperative diagnosis, Intra operative procedure, co morbidity (30). Factors that contribute to the outcomes of surgically treated bowel obstruction could be socio demographic characteristics, Life style characteristics, preoperative clinical characteristics, intraoperative clinical characteristics, postoperative clinical characteristics, length of hospital stay(8).

2.2.1. Socio-demographic factors

Age greater or equal to 55 years old were with significant statistical association with poor outcome of bowel obstruction since these age group were nearly three times more likely to develop poor outcome of Bowel obstruction surgical treatment, compared with patients whose age group of less than 55 years (12). A total of 69 male and 31 female patients, presented with acute mechanical bowel obstruction during the period of a study. Mean patient age was 48.5 years with peak incidence in those aged 31-45 years (15). The global prevalence of mechanical bowel obstruction is estimated to be 3 to 15 percent of cancer patients. Surgery should always be considered for patients in the initial stages of the disease with a preserved general status and a single level of occlusion. Less invasive approaches such as duodenal or colonic stenting should be considered when surgery is contraindicated in obstructions at the single level. The priority of care for in operable and consolidated mechanical bowel obstruction is to control symptoms and promote the maximum level of comfort possible (31). Residency, educational status and working environment are factors which affect the prevalence of bowel obstruction as well as treatment outcomes. In Neonates bowel obstruction is usually caused by intussusception and rarely a ganglionic mega colon. From these for early diagnosis and management of bowel obstruction those who can provide information by themselves unlike neonates will favor good outcome (32).

2.2.2. Preoperative clinical characteristics

Abdominal pain, vomiting, abdominal distension, and failure to pass abdominal contents, such as feces or flatus are the leading clinical symptoms among patients presenting with Bowel obstruction at the health care facility of a study. The most common specific preoperative clinical diagnosis of the patients was simple small bowel obstruction, followed by simple large bowel

obstruction and gangrenous small bowel obstruction. Others including gangrenous large bowel obstruction and incarcerated hernia are the less common preoperative clinical diagnoses identified among those patients presenting with bowel obstruction at the hospital facility [8, 20]. Regarding the duration of illness, 66.5 percent cases are presented longer than 24 hours after the onset of bowel obstruction symptoms until undergoing operation. The duration however ranges from 2 to 120 hours among them. The study also shows 13.2 percent of patients had a previous history of abdominal surgery, and 5.7 percent of all bowel obstruction cases had at least one diagnosed co morbid condition of cardiovascular diseases, lung diseases, diabetes mellitus, or other chronic disorders as documented in their medical records(8, 18). Elements of preoperative care were assessed in a study, Intra venous fluid resuscitation was given for all patients; nasogastric tube was inserted for 54.2 percent patients; and preoperative prophylactic antibiotics was initiated for 79.3 percent patients with a combination of ceftriaxone and metronidazole, with ceftriaxone alone 37.9 percent, and with ampicillin 5.7 percent, whereas the rest 20.7 percent of all patients did not received any prophylactic antibiotics before their operation for bowel obstruction management,(8, 17). Right preoperative diagnosis and best decision making preoperatively are some of the factors that determine the surgically managed bowel obstruction outcome along with other factors. Preoperative resuscitation until patient is stable, Preoperative broad spectrum antibiotics; nasogastric tube insertion and catheterization are also important preoperative steps which help in the post-operative improvement of such clients(9, 10). Absence of passage of flatus and or feces and abdominal distension are the most common symptoms and physical finding of patients with acute mechanical bowel obstruction, respectively. Adhesion, hernias, and large bowel cancer are the most common causes of obstruction, as well as of bowel ischemia, necrosis, and perforation. Although an important proportion of these patients can be conservatively treated, a substantial portion requires immediate operation. Great caution should be taken for the treatment of these patients since the incidence of bowel ischemia, necrosis, and perforation is significantly high (33).

2.2.3. Intraoperative clinical characteristics

Factors which had a significant statistical association with the development of poor outcome of Bowel obstruction surgical treatment were Gangrenous large bowel obstruction and Gangrenous small bowel obstruction. Early intervention had lower poor outcome. Following standard operating procedure for every procedure decrease the acquisition of microorganism into surgical

wound, hence the lower the infectious organism, the lower the magnitude of poor outcome. Cause of obstruction, viability of bowel, type of procedure done all affects bowel obstruction treatment outcomes(12). Gangrenous sigmoid volvulus was the leading specific intraoperative clinical diagnosis of bowel obstruction, followed by simple small bowel volvulus, gangrenous small bowel volvulus, adhesion and band, intussusception, and simple sigmoid volvulus among others. The commonest specific type of intraoperative procedure done, after a general laparotomy, to treat the patients with Bowel obstruction was resection and anastomosis. Postoperative antibiotics were initiated for the majority of patients and this enhances good outcomes(8, 20).

2.2.4, Postoperative characteristics

Fluid resuscitation and electrolyte balance, administration of antibiotics after the operation and properly applying infection prevention protocol with proper post-operative follow up all enhance good outcome. Clients with co morbidities like with hypertension, Diabetes mellitus, Human immune deficiency virus, Renal Disease, Cardiac disease shall be followed in more strict way possibly in the intensive care unit to favor good treatment outcomes (10, 12). Since American Society of Anesthesiologists score, presence of proximal colon damage, and preoperative renal failure were significant predictors of outcome in clients with these risks post-operative intensive care with the most senior physician will enhance good outcome. Regarding the length of hospital stay, 36.1 percent patients stayed in the hospital for >8 days after their surgery for bowel obstruction. The mean, median, and standard deviation of hospital stay in days were founded to be 9.07, 7, and 7.32, respectively, with the minimum of 1 day and the maximum of 60 days .Longer hospital stay is either effect of poor outcome or cause(8).

There was not much study conducted concerning the operative Treatment outcome and associated factors of Bowel obstruction in Ethiopia particularly in the study area. Hence, this study will be conducted with the aim of assessing Operative treatment outcomes of bowel obstruction and associated factors in Debre Tabor comprehensive specialized hospital.

2.3. Conceptual Frame work

Figure 1: This Frame works are compiled with Reference from Articles Used in the Literature(19)

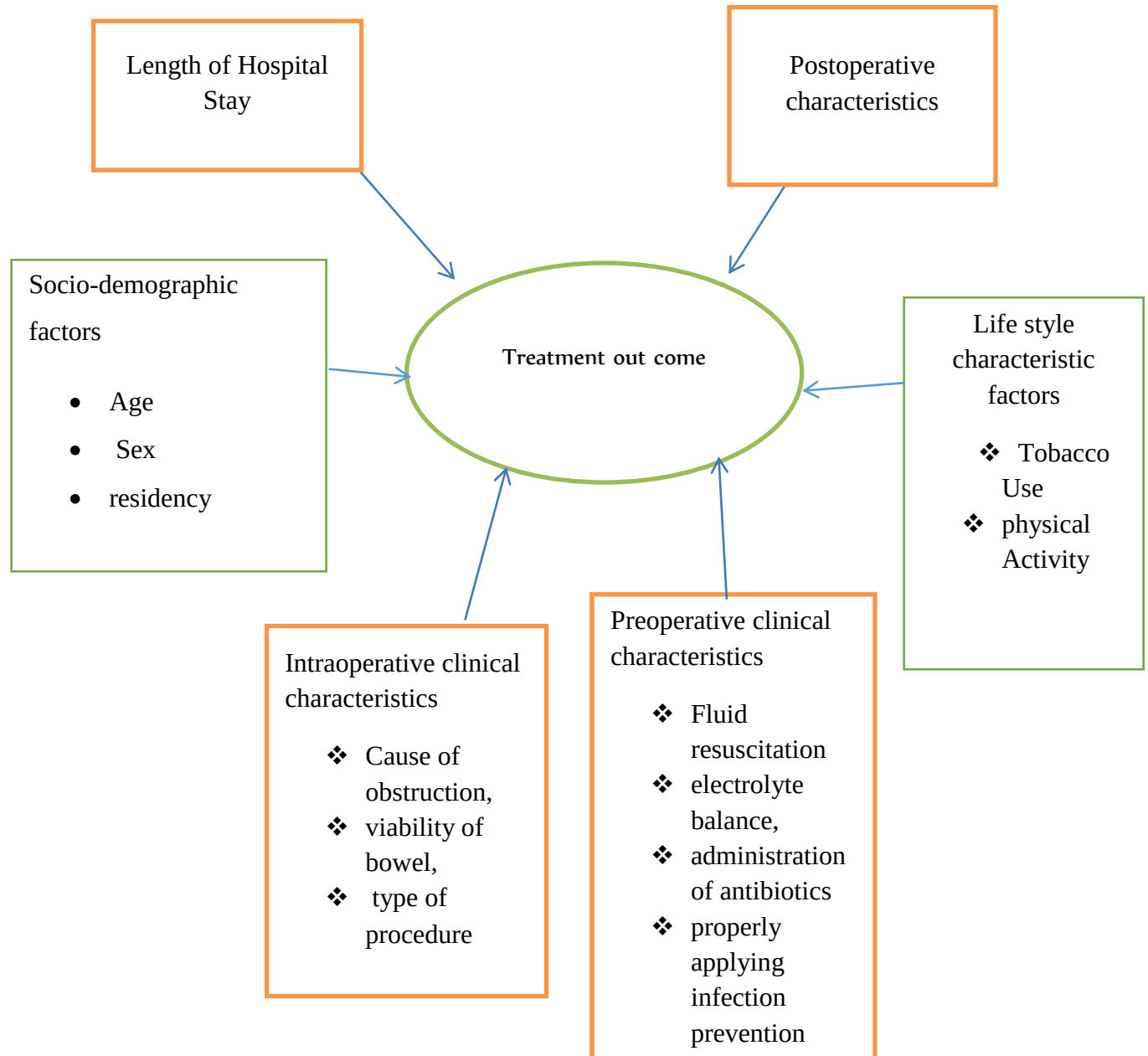


Figure 1: Conceptual frame work developed from reference from Articles Used in the Literature.

4. Objectives

4.1. General objective

- ❖ To assess the Operative Treatment outcomes of Bowel obstruction and Associated factors in Debre Tabor comprehensive specialized hospital, north central Ethiopia.

4.2. Specific objectives

- ❖ To determine Operative treatment outcomes of bowel obstruction in Debre Tabor comprehensive specialized hospital.
- ❖ To identify associated factors for operative Treatment out comes of bowel obstruction in Debre Tabor comprehensive specialized hospital.

5. Methodology

5.1. Study area and period

This study was conducted In Debre Tabor comprehensive specialized hospital in Debre Tabor town. Debre Tabor town is a town in north Central Ethiopia found 667 KM away from Addis Ababa, 100 KM south east of Gondar and 50 KM east of Lake Tana, in South Gondar zone of Amhara Regional state. Currently the hospital serves as a referral hospital for all woredas of south Gondar Zone with estimated population of 2,578,906 and some parts of south Wollo- zone [Office2020].

Debre Tabor comprehensive specialized Hospital has a bed capacity of 165, out of this 35 belongs to the surgical ward. In this ward there are thirteen general surgeons, six IESOs, seven general practitioners, 08 nurses and also in operation room 11 anesthetics and 9 nurses giving care for surgical patients. It also has laboratory and x-ray facilities [Office2020]. This study was conducted from April 08 2022 to June 30 2022 by reviewing operatively treated bowel obstruction Patient Charts and Operation room Registration books by using structured Checklist since January 01 2018 to December 30-2021 in Debre Tabor Comprehensive specialized Hospital, South Gondar zone of Amhara Region.

5.2 Study design

Institution based Cross sectional study with patient chart and Register Review was Conducted on patients, who had operatively treated Bowel obstruction from April 08 to June 30, 2022 in Debre Tabor Comprehensive specialized Hospital, South Gondar zone of Amhara Region.

5.3 Source population

The source population Comprised of all patients with Operatively Treated Bowel obstruction in Debre Tabor comprehensive specialized Hospital.

5.4. Study population

The study populations comprised of all patients with Operatively Treated Bowel obstruction in Debre tabor comprehensive specialized Hospital during January 9 2019 to January 08/2021.

5.5 Eligibility Criteria

5.5.1. Inclusion Criteria

Patients who had Operative Treatment for Bowel obstruction at Debre Tabor comprehensive specialized Hospital during January 01 2018 G.C to December 30 2021 was included in the study.

5.5.2 .Exclusion Criteria

In complete or lost record over the data of interest was excluded from the study.

5.6. Sample size and Sampling technique

5.6.1. Sample

Sample size was be calculated by using single population proportion formula. $n_i = (z^2_{@/2} * p(1-p)) / d^2$ which was be 131 with considering the following assumptions. $Z=1.96$, $P =21.8\%$ from similar study that was conducted in Adama Hospital south eastern Ethiopia,2016[12] and $d=5\%$. Z is the value of standard normal distribution curve at the 95% level of confidence, p is the proportion of population with Bowel obstruction among surgically Treated acute abdomen, d is the margin of error.

This study also planned to determine associated factors and study participants of higher value shall be taken for better conclusion so sample size will also be calculated Using associated Factors the second objective. From a study conducted in university of Gondar comprehensive specialized hospital in 2018(10).Some variables are determined to be associated with either good or poor outcomes of surgical management of acute abdomen for bowel obstruction which are duration of illness, Co-morbidity, Preoperative diagnosis, intraoperative diagnosis, intraoperative procedure and hospital stay analysis done and with components sample size is going to be calculated from this articles results using some associated factors as follows.

Table 1: Sample size determined using the second objective

S.no	Variables	Assumptions						
		Confidence interval	Power	Design Effect	Ratio Exposed to Un Exposed	Percent of exposed without come	Odds Ratio	Sample size with 10% non-responses Rate
1	Duration of illness	95	80	2	1:1	97.6	8.99	308
2	Preoperative Diagnosis	95	80	2	1:1	46.2	0.1	98
3	Intraoperative Diagnosis	95	80	2	1:1	60.5	0.04	106
4	Intraoperative procedure	95	80	2	1:1	70.9	0.09	176
5	Co morbidity	95	80	2	1:1	41.4	0.12	98
6	Length of hospital Stay	95	80	2	1:1	89.4	3.28	400

NB. Sample size was taken from second objective and it will be 400.

5.6.2. Sampling

Systematic sampling technique was used to select study participants. For this purpose, all patients who had been treated surgically BO with in the study period at DTCSH was listed by using medical record number as a sampling frame.

5.7. Variables

5.7.1 Dependent variable

□ **Treatment outcome (good vs poor)**

5.7.2 Independent variables

Table 2: Independent Variables

Socio demographic	Preoperative	Intraoperative	Postoperative
Age	Duration of illness	Intraoperative diagnosis	Postoperative antibiotics
Sex	Comorbidity	Intraoperative procedure	Length of hospital stay
Residence	Preoperative care	Estimated Blood loss	Vital sign follow up
Religion	Preoperative diagnosis	Blood transfusion	Postoperative hemodynamic status
Occupation	Presenting symptom		
Marital status	Hemodynamic status		

5.8. Operational definitions

□ Bowel obstruction is partial or complete blockage of the Bowel producing symptoms of vomiting, constipation, distension and abdominal pain(10).

□ Laparotomy - is a surgical procedure involving an Incision usually greater than five centimeter through the abdominal wall to gain access in to the Peritoneal Cavity(9).

□ Length of Hospital stay:-Number of days elapsed while the patient is in the hospital(9).

□ Outcome:-Condition of the patient at discharge either improved and developed no postoperative complication or improved but developed one or more complications, or dead(12, 34).

□ Good outcome:-Patients who undergo laparotomy for the clinical diagnosis of bowel obstruction improved and discharged from the hospital and developed no postoperative complications following operation(35).

□ Poor outcome: Patients with a clinical diagnosis of bowel obstruction who improved but developed one or more postoperative complication, e.g. wound infection, adhesion and Patients with a clinical diagnosis of large bowel obstruction who have died in the Intra or postoperative period(9, 35).

5.9. Data collection instrument and data collection procedures

After Operatively treated bowel obstruction cases identified from Operation Register their Medical record number was listed, and study participants was selected using systematic random sampling. By using checklist data were collected by two trained nurses who were supervised by principal investigator.

5.10. Data processing and analysis

All collected data were checked by the investigator, then coded and entered into Epi Data version 3.1, and then exported in to SPSS version 25 for analysis. Frequencies with percentages used to describe the entire variables of the study assessed. Bivariable analysis was used to select the independent variables associated with the surgical management outcome of Bowel obstruction as the binary dependent variable. All factors with a P value <0.25 in the Bivariable logistic regression analysis were considered as a candidate to be entered into the multivariable logistic regression analysis, in which statistical significance was based on a P value <0.05 . For this purpose, adjusted odds ratios with 95% confidence interval were calculated as measure of the strength of the association.

5.11. Data quality assurance

The data collector was trained for one day. Before data collection started patient cards and Operation room registration books was crosshatched.

5.12. Ethical clearance

Initially Study was approved by Institutional Health Research and Ethical Review Committee of Bahir Dar University, CMHS. Following this Official letter was written to DTCSH and permission was obtained from the DTCSH. Then written and signed consent was obtained from the chief executive office of DTCSH. The staffs including Card room workers and operation room staffs was informed about the purpose of the study and verbal consent was obtained, Confidentiality of patient's chart information was assured and Data was collected.

6. Result

6.1. Socio demographic Characteristics.

A total of 400 patients who had a history of surgery for Bowel obstruction at Debre Tabor comprehensive specialized Hospital were included. In this study 188(47%) patients were between 30 and 49 years old, 45(11.3%) were above 70 years old and 2 were <15 years old between the range of 11 and 87 years. Three hundred sixteen (79%) of patients were males and 203(50.7%) of them were rural dwellers (see table 3)

Table 3: Socio-Demographic Characteristics of Bowel Obstruction Patients, July 2022 (N=400)

Variable	Category	Frequency	Percent
Age in Years	<15	2	0.5
	16-29	61	15.3
	30-49	188	47
	50-69	104	26
	>70	45	11.3
Sex	Male	316	79
	Female	84	21
Residence	Rural	203	50.7
	Urban	197	49.3
	Married	295	73.8
	Single	69	17.3
	Widowed	24	6
	Divorced	12	3
Religion	Orthodox	333	83.3
	Protestant	23	5.8
	Muslim	44	11
Occupation	Civil servant	107	26.8
	Merchant	54	13.5
	Driver	14	3.5
	Farmer	184	46
	Others	41	10.3

6.2. Preoperative Clinical Characteristics

The findings show all patient have abdominal pain, 334(83.5%),had vomiting, abdominal distension 345 (86.3%), and failure to feces 313(78.3% and flatus, 396(99%) ,149(37.3%) patients are febrile,264(66%) had anorexia, are the leading clinical symptoms among patients presenting with bowel obstruction at the health care facility 88(22 %) were with known chronic illness like cardiovascular disease 20(5%) lung disease 22(5.5%), diabetes mellitus 36(9%) , liver disease 4(1%) renal disease 5(1.3%) as documented in their medical records, 398(99.5%) were sick looking, 312(78 %) with unstable vital sign on arrival,298(74.5%) were dehydrated,140(35%) in shock on arrival,23(5.8%) with history of previous abdominal surgery,147(36.8%) with abdominal tenderness,,96(24%)presented with similar attack,131(32.8%) had visible peristalsis,32(8%) with abdominal mass,110(27.5%) with board like tense abdomen,16(4%) with hernia,238(59.4%)presented with empty rectum, 135(33.8%)with Leukocytosis and 344(86%) given prophylactic antibiotics with the most common specific preoperative clinical diagnosis of the patients was simple SBO 182(45.5%) followed by simple LBO 111(27.8%) and gangrenous SBO 54(13.5%) and GangrenousLBO38(9.5%) finally hernia accounted15(3.8%). Regarding the duration of illness, 76(19%) cases are presented within 24 hours after the onset of Bowel obstruction symptoms and 211(52.8%) presented with in 24-48 hours and 113(28.2) presented after 48 hours of onset of symptoms and signs.321 (80.3 %) under goes surgery within 24 hours after diagnosisand79(19.8%)after 24 hours of diagnosis. Concerning the key elements of preoperative care for all patients; and preoperative antibiotics was initiated generally for, 344(86%) as prophylactic and both given a combination of ceftriaxone and metronidazole.

Table 4: Preoperative characteristics of Bowel obstruction patients at Debre tabor comprehensive specialized hospital, Ethiopia (N=400).

Variable	Category	Frequency	Percent
Presenting symptom	Abdominal Pain	400	100
	Abdominal Distension	345	86.3

	Vomiting	334	83.3
	Fever	149	37.3
	Failure to pass feces	313	78.3
	Anorexia	264	66
	Failure to pass flatus	396	99
	Visible peristalsis	131	32.8
	Failure to pass urine	40	10
	Spo2<95	30	7.5
	Sick looking	398	99.5
	Pulse rate >100	312	78
	Systolic BP <90	148	37
	Temperature >37.5	154	38.5
Abdominal mass	Yes	32	8
	No	368	92
Preoperative Diagnosis	Simple SBO	182	45.5
	Gangrenous SBO	54	13.5
	Simple LBO	111	27.8
	Gangrenous LBO	38	9.5
	Hernia	14	3.5

Variable	Category	Frequency	Percent
History of similar attack	Yes	96	24
	No	304	76
Hernia site free	Yes	384	96
	No	16	4
Abdominal scar	Yes	23	5.8
	No	377	94.3
Empty rectum	Yes	238	59.5
	No	162	40.5
Preoperative Antibiotics prophylaxis	Yes	344	86.8
	NO	56	14
Preoperative IV fluid started	Yes	400	100
Duration of illness in hours	Lessthan24Hours	76	19
	24-48Hours	211	52.8
	>48Hours	113	28.2
Comorbidity		312	78

	No		
	yes	88	22
	RVI	22	5.5
	DM	36	9
	Asthma	22	5.5
	Cardiac Disease	20	5
	Renal disease	5	1.3
Previous Abdominal surgery	Yes	36	9
	No	364	91
Duration of hospital stay before surgery	<24 hours	321	80.3
	>24Hours	79	18.7
Vital sign on arrival	Stable	87	21.8
	Unstable	313	78.3
Shock on arrival	Yes	140	35
	No	260	65
Abdominal Tenderness	Yes	147	36.8
	No	253	63.2
NG tube inserted	Yes	392	98
	No	8	2

Tense Abdomen	Yes	110	27.5
	No	290	72.5
Leukocytosis	Yes	135	66.3
	No	265	66.3

6.3. Intraoperative Clinical Characteristics

Simple small bowel obstruction 139(34.8%) was the leading cause of bowel obstruction diagnosed Intra operatively followed by simple Large bowel obstruction 97(24.3%), gangrenous Large bowel obstruction 83(20.8%), and Gangrenous Small bowel obstruction 35(8.8%), hernia 24(6%), ileo sigmoid knotting 16(4%), finally adhesion accounted 6(1.5%) Among 400 patients who undergo for laparotomy 109(27.8 %) were require blood transfusion. The commonest specific type of intraoperative procedure done, after a general laparotomy, to treat the patients with bowel obstruction was de-rotation 138(34.5%). Intra operatively 134(33.5) of patients experienced 500-1000 ml of blood loss.

Table 5:: Intraoperative characteristics of Bowel obstruction patients at Debre tabor comprehensive specialized hospital, Ethiopia(N=400)

Variable	Category	Frequency	Percent
Intraoperative blood transfusion	Yes	109	27.8
	No	291	72.8
Estimated Blood loss	Lessthan250ml	66	16.5
	250-500ml	103	25.8
	501-1000ml	134	33.5
	>1000ml	97	24.3
Intraoperative diagnosis	Simple SBO	139	34.8
	Gangrenous SBO	35	8.8
	Simple LBO	97	24.3
	GangrenousLBO	83	20.8

	Hernia	24	6
	Ileo sigmoid knotting	16	4
	Adhesion	6	1.5
Operative procedure Done	Reduction	29	7.2
	De-rotation	138	34.5
	Adhesiolysis	23	5.8
	Resection and Anastomosis	88	22
	Stoma	123	30.8
Type of anesthesia	General anesthesia	400	100
Surgical field cleaned	OH	107	26.8
	Iodine	112	28
	Both	181	45.3

6.4. Postoperative Clinical Characteristics

138(34.5%) were unstable vital sign. 192(48%) of patients took antibiotics for more than 3 days and those who took 3-5 days were 129(32.8%) , while 79(19.8%)took for>5days. 137(34.3%) patients were develop post op complication. The most common post-operative complication were pneumonia, 59(14.8%) followed by SSI 39(9.8%), leak19 (4.8%), Dehiscence 18(4.6%), Respiratory failure 15(3.8%), septic shock 36(9.1 %).While majority of patients 217(54.3%) average length of hospital stay was <6 days followed by 183(45.8%) less than 6 days. Majority of patients discharged improved 318(79.5%), with complications16 (4%).

Table 6: Postoperative clinical characteristics of Bowel obstruction patients at Debre tabor comprehensive specialized hospital, Ethiopia (N=400).

Variable	Category	Frequency	Percent
Vital sign	Stable	262	65.5
	Unstable	138	34.5
Post-operative Vital sign follow up	<4 hours	242	60.5
	>4 hours	158	39.5
Post-operative antibiotics	Continued	392	98
	Initiated	8	2
Duration of Antibiotics	Lessthan3Days	192	48
	3-5Days	133	33.3
	Greaterthan5Days	75	18.8
Post-operative complication	Yes	137	34.3
	No	263	65.8
	SSI	39	9.8
	Anastomosis leak	19	4.8
	Dehiscence	18	4.6
	Pneumonia	59	14.8
	Septic shock	36	9.1
	Hypokalemia	12	3.1

Postoperative complications	Respiratory failure	15	3.8
	UTI	37	9.3
	Dead	17	4.3
Length of Hospital stay	Lessthan6Days	217	54.3
	>=6Days	183	45.7

6.5. Treatment outcome

This study shows 82 (20.5%) have poor surgical management outcomes whereas the rest 318 (79.5%) patients have Good outcomes.

Table 7Treatment outcome of Bowel obstruction patients at Debre tabor comprehensive specialized hospital, Ethiopia (N=400).

Variable	Category	Frequency	Percent
Treatment Out come	Good	316	79
	Poor	84	21
Discharge status	Improved	316	79
	Complicated	19	4.8
	Dead	65	16.2

6.6 Factors associated surgical management outcome of Bowel obstruction

Simple logistic regression analysis was conducted and those variable which were $p < 0.25$ were entered in to multiple logistic regression **duration of illness**, **history of chronic illness**, **abdominal tenderness**, Shock on arrival, preoperative diagnosis, Blood Transfusion, intraoperative estimated blood loss, **type of procedure**, **Post-operative vital sign**, postoperative hemodynamic status, length of hospital stay, and postoperative complication were associated with the surgical management outcome of Bowel obstruction. Subsequently, all these factors were entered into the multivariable binary logistic regression model. In the multivariable analysis, Factors significantly associated with the surgical management outcome of Bowel obstruction were abdominal tenderness, History of chronic illness, preoperative diagnosis, intraoperative procedure, intraoperative blood transfusion and post-operative vital sign. The patients who had history of chronic illness more likely to have poor outcome than patients who haven't (AOR = 0.184 95% CI:0.076-0.0445; $P = 0.00$). Patient who had abdominal tenderness preoperatively had poor outcome than those who haven't (AOR=0.207; 95% CI:0.086-0.497; $P=0.00$) The patients who were presenting with gangrenous bowel more likely to have poor outcome than those with simple small bowel obstruction (AOR= 0.42, 95% CI:0.142-0.986; $P = 0.047$). The patients with REEA and stoma had poor outcome than de-rotation procedure (AOR= 0.32; 95% CI:0.02-0.911; $P = 0.01$) and (AOR= 0.25; 95% CI:0.18-0.643; $P = 0.00$) respectively. Patients with blood transfuse more likely to have poor outcome than those who were stable (AOR= 0.344; 95% CI: 0.134-0.883 $P = 0.026$). The patients with Post-operative vital sign follow up < 4 hours more likely to have poor outcome than those with vital sign follow up > 4 hours (AOR=0.108; 95% CI: 0.028-0.413; $P < 0.001$.)

Table 8: Factors associated with the surgical management outcome of BO at DTCSH, Ethiopia,. (N=400).

Variables	Category	Outcome		COR,(95%CI)	AOR,(95%CI),P-value
		Good	Poor		
duration of illness	<24	71	5	1	1
	24-48	172	39	3.220(1.219-8.504)*	
	>48	73	40	7.781(2.904-20.844)*	
History of chronic illness	Yes	47	41	5.457(3.218-9.255)*	
	No	269	43	1	1
Abdominal tenderness	Yes	83	64	8.983(5.125-15.744)*	
	No	233	20	1	1
shock at arrival	Yes	76	64	10.105(5.746-17.771)*	
	No	240	20	1	1
Preoperative Diagnosis	Gangrenous SBO	75	34	12.920(4.404-37.902)*	
	Gangrenous LBO	74	38	14.635(5.015-42.710)*	
	Simple LBO	53	8	4.302(1.240-14.920)	
	Simple SBO	114	4	1	1
Type of procedure	REEA	107	7	0.440(0.31-0.821)*	
	Stoma	68	74	0.026(0.01-0.42)*	
	De-rotation	104	3	1	1

Intraoperative estimated blood loss	<250ml	64	2	1	1
	250-500ml	86	17	6.326(1.411-)28.362*	
	500-100ml	108	26	7.704(1.769-33.541)*	
	>1000ml	58	39	21.517 (4.973-93.093)*	
Type of procedure	DE rotation	104	1	1	1
	REEA	129	9	7.256(.905-58.199)*	
	Stoma	83	74		
Intraoperative blood transfusion	Yes	49	60	0.0734(0.42-0.129)	
	No	267	24	1	1
Postoperative hemodynamic	Stable				
	Unstable				
length of hospital stay	<6days				
	>6days				
postoperative complication					
Postoperative vital sign	<4hour	213	21	6.20(3.59-10.7)*	
	>=4hour	103	63	1	1

N.B. *= significantly associated in Binary Logistic regression at 95% confidence interval,

**=significantly Associated with multivariable logistic regression, at 95% confidence interval

7. Discussion

7.1. Surgical Management Outcome:

The aim of the present study was to analyze the surgical management outcome of Bowel obstruction and its associated factors at Debre Tabor Comprehensive Specialized Hospital. The study showed that 21% of cases had poor surgical management outcomes. The finding of this study was slightly higher than, 16.7% in University of Gondar comprehensive specialized Hospital(8), but it is lower than the findings from a study conducted in Gelemso General Hospital Eastern Ethiopia which is 32.8%(35), and the studies southeastern Ethiopia and 24.6% in Adama Hospital(11), and also lower than the findings from other countries, such as 29.0% in Nigeria(1) and 28.3% in India(17) . The possible reason for the difference in treatment outcome of the study might be due to variation in the distribution of the clinical and socio demographic characteristics of the study participants, the Perioperative characteristics of the study participants, the hospital internal setups itself, and the overall infrastructures of the study area, the working SOPS and policies, as well as may depend on the operational definitions used between the literature. This study revealed that, history of chronic illness, abdominal tenderness Preoperative Diagnosis, Intra operative procedure, intraoperative blood transfusion, post-operative vital sign were factors significantly associated with the surgical management outcome of Bowel obstruction. The patients seeking health care for Bowel obstruction has history of chronic illness more likely to have poor outcome than those seeking health care that haven't comorbidity. This finding is supported by the research studies conducted in Eastern Ethiopia and in United States of America,(10, 12). but not supported by a research study done in North West Ethiopia and in Uganda(8, 36). The possible reason for the poor outcome of patients who has history of chronic illness Senescence related weakened immunity .this result implied that comorbid patients' are more affected by bowel obstruction management complication, delayed wound healing, facial dehiscence. for this the community needs health education on prevention of STD(HIV),food optimizing, avoid obesity and the symptoms, signs and duration effect of bowel obstruction to actively participate in health seeking for the symptoms in special care.

This study also showed the patients presenting with abdominal tenderness were more likely to have poor outcome than those who were not tender on examination, more of indicates severity of bowel obstruction. It is consistent with other studies conducted in Ethiopia(8, 11) and in India (18, 20).

Another significantly associated factor in this study is Preoperative working diagnosis. The patients with preoperative diagnosis of Gangrenous small bowel obstruction were about fifteen times more likely to have poor outcome than those with preoperative diagnosis of simple small bowel obstruction .It is consistent with other studies conducted in Ethiopia[(11, 35)and in Nigeria (9), 30 Patients with Gangrenous small bowel obstruction may have increased chance of getting septic shock due to the ongoing septicemia from the gastrointestinal focus that may be the common cause of multiple organ failure and higher mortality rate in surgical patients. The patients with preoperative diagnosis of Gangrenous Large bowel obstruction were about more likely to have poor outcome than those with preoperative diagnosis of simple small bowel obstruction that may be due to the same thing will happen as Gangrenous small bowel obstruction and it may also increase the chance of surgical site infection and anastomotic leakage. Since the preoperative diagnosis is such important to affect the management out come a clinician approaching a patient at surgical emergency outpatient department must be careful on proper history taking and physical examination to have possible correct specific diagnosis with the aid of laboratory and audio logical investigations. The institution shall always avail complete blood count, Radiology service includingProctoscope, anoscope, sigmoid scope, contrast studies and CT-Scan in collaboration with the regional health bureau and federal ministry of health so as to make the possible correct preoperative diagnosis. The patients with Unstable Intra operative vital sign were about eight times more likely to have poor outcome than those with stable Intra operative vital sign. This significant association is supported by studies in Ethiopia (3, 35) and United States of America (9, 29) while not supported by studies done in India (24, 34). It might be Due to unstable intraoperative vital sign affects the tissue per fusion which is the most important determinant of surgical wound healing including the manipulated bowel or the abdominal wall, in addition Perfusion to organs like kidney and brain is might be affected which in turn causes poor out come by either complication other than death or death itself from multiple organ failure.as much as possible in surgical patients the vital signs during operative time must be kept stable by any means available including intravenous fluids ,Vasopressors and choice of

appropriate anesthesia and the surgical team shall always consider intraoperative vital sign of a patient while operating. Operating rooms shall also be warm and clean which is taken by the institution not to cause hypothermia in turn causes hypotension.

The other factor associated to surgical management outcome of Bowel obstruction is the patients with blood transfusion Intra operatively were about more likely to have poor outcome than those with no Intra operative blood transfusion. This Result is supported by studies conducted in United States of America and Europe(9, 10) while no study conducted in Ethiopia supports. The possible reasons for the poor outcome from blood transfusion Intra operatively might be Patients who require blood transfusion are those who are with higher amount of blood loss or who are in the complicated stage of the disease with significantly affected Hemodynamic status as well some events associated with transfusion may tend to occur like increased risk of surgical site infection and shock lung Patients with bowel obstruction who were not in shock may have decreased chance of Hemo dilution due to aggressive resuscitation which in turn may decrease the risk of Intra operative fluid overload and associated complications, such as Pulmonary edema. For those who need transfusion the standard precautions of blood transfusion must be practiced while all patients in need of massive transfusion must be according to the massive transfusion protocol which shall be developed by the hospital and if this is not in place referral might be considered. For the setup of massive transfusion protocol the regional health bureau shall be involved

The patients with Unstable were about one hundred seventy times more likely to have poor outcome than those with stable Post-operative hemodynamic stable and this result is in line with studies in Ethiopia(14) and Rwanda(34). It might be Due to unstable postoperative vital sign affects the tissue perfusion which is the most important determinant of surgical wound healing including the manipulated bowel or the abdominal wall, in addition Perfusion to organs like kidney and brain is might be affected which in turn causes poor outcome by either complication other than death or death itself from multiple organ failure.it could be sequential result of unstable Intra operative vital sign or new onset due to patient or management factors. Staffs who are assigned to follow post-operative patients to follow every 15 minute for 2 hours, every 30 minute for 2 hours, and every 1 hour for 4 hours with appropriate intervention. The physician who operates a patient shall be always available around for any concern in need of him or her The

institution must avail recover room equipment's like intra nasal oxygen, Face masks, Beds, emergency drugs.

8. Conclusions

This study provided insight into the surgical management outcome and its factors associated among patients with Bowel obstruction at a tertiary teaching hospital in North central Ethiopia. Poor management outcome of patients with Bowel obstruction who were treated surgically at Debre Tabor Comprehensive specialized Hospital was high; this can result in significant morbidity and mortality. Determinant factors including History of chronic illness, abdominal pain, Preoperative Diagnosis, Intra operative procedure, Post-operative Vital sign and postoperative hemodynamic status of patients were significantly associated with the surgical management outcome of Bowel Obstruction. To decrease poor management outcome : Health education, Perioperative vital sign stabilization with all possible management options available up to date including adequate volume replacement, Decreasing intraoperative blood loss and duration of surgery, using vasopressors, ,administration of prophylactic antibiotics prior to operation and proper application of infection prevention protocol and standard operating procedure are important. Even though, the occurrence of poor management outcome is not preventable still it can be decreased largely through assessing the risk factors, early recognition and following the standardized management protocol.

9. Recommendation

To decrease poor management outcome: This study recommends Health education, Perioperative vital sign stabilization with all possible management options available up to date including adequate volume replacement, Decreasing intraoperative blood loss and duration of surgery, using vasopressors,, administration of prophylactic antibiotics prior to operation and proper application of infection prevention protocol and standard operating procedure are important. Even though, the occurrence of poor management outcome is not preventable still it can be decreased largely through assessing the risk factors, early recognition and following the standardized management protocol.

10. Limitation

The study cannot trace complications which are late. It is also limited in addressing other acute abdominal conditions like acute appendicitis, perforated peptic ulcer disease, Pancreatitis, Cholecystitis which are all differential diagnosis of bowel obstruction.

11. Refferences

1. Ojo E, Ihezue C, Sule A, Ismaila O, Dauda A, Adejumo A. Aetiology, clinical pattern and outcome of adult intestinal obstruction in JOS, north central Nigeria. *African journal of medicine and medical sciences*. 2014;43(Suppl 1):29.
2. Otu A. Tropical surgical abdominal emergencies: acute appendicitis. *Tropical and geographical medicine*. 1989;41(2):118-22.
3. Gebre S. Causes and outcome of surgically treated non-traumatic surgical acute abdomen in Suhul general hospital, Shire, northwest Tigray, Ethiopia, a retrospective study. *American Academic Scientific Research Journal for Engineering, Technology, and Sciences*. 2016;16(1):74-89.
4. Mohamed A, Sahoo N, Das SK, Das BB, Pradhan SK, Gouda PK. Profile of operated acute intestinal obstruction patients at a tertiary health care institution. *Journal of Evolution of Medical and Dental Sciences*. 2017;6(15):1215-20.
5. Springer JE, Bailey JG, Davis PJ, Johnson PM. Management and outcomes of small bowel obstruction in older adult patients: a prospective cohort study. *Canadian Journal of Surgery*. 2014;57(6):379.
6. Ayenew Z, Gizaw A, Workneh D, Fentahun N. Outcome of non-traumatic surgical acute abdomen in nekemte referral hospital southwest Ethiopia: a retrospective cross-sectional study. *Surgery Curr Res*. 2016;7(282):1-5.
7. Ntakiyiruta G, Mukarugwiro B. The pattern of intestinal obstruction at Kibogola Hospital, a Rural Hospital in Rwanda. *East and central African journal of surgery*. 2009;14(2):103-8.
8. Mariam TG, Abate AT, Getnet MA. Surgical management outcome of intestinal obstruction and its associated factors at University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia, 2018. *Surgery research and practice*. 2019;2019.

9. Schwartz S, Brunicaardi F, Andersen D, Billiar T, Dunn D, Hunter J. Schwartz's principles of surgery. 2015. New York: McGraw-Hill Education.
10. Zinner MJ, Ashley S, Hines O. Maingot's abdominal operations. 2019. McGraw-Hill Education.
11. Soressa U, Mamo A, Hiko D, Fentahun N. Prevalence, causes and management outcome of intestinal obstruction in Adama Hospital, Ethiopia. BMC surgery. 2016;16(1):1-8.
12. Derseh T, Minuye B, Yusouf M, Dingeta T. Management Outcome and Associated Factors among Intestinal Obstruction Patients Treated Surgically, Eastern Ethiopia. 2019.
13. Wangenstein. Historical aspects of the management of acute intestinal obstruction. Surgery. 1969.
14. Tassew B, Haile M, Tefera T, Balda S, Gonfa K, Mubashir K. Presentation and outcome of acute abdomen in Goba Referral Hospital, Goba, Southeast Ethiopia: retrospective study. SM Journal of Family Medicine. 2017;1:1-4.
15. Sharma L, Srivastava H, Pipal DK, Kothari S, Dhawan R, Purohit PM. Acute intestinal obstruction: small intestine vs. large intestine: an analysis. International Surgery Journal. 2017;5(1):162-7.
16. Sule AZ, Ajibade A. Adult large bowel obstruction: a review of clinical experience. Annals of African medicine. 2011;10(1):45-50.
17. Tiwari SJ, Mulmule R, Bijwe VN. A clinical study of acute intestinal obstruction in adults-based on etiology, severity indicators and surgical outcome. Int J Res Med Sci. 2017;5(8):3688-96.
18. Pandey Y. A prospective study of cases of intestinal obstruction and role of conservative expectant management. International Surgery Journal. 2018;5(6):2191-4.
19. Weledji EP. Perspectives on large bowel obstruction. IJS Short Reports. 2017;2(1):1-4.
20. Shivakumar C, Shoeb MFR, Reddy AP, Patil S. A clinical study of etiology and management of acute intestinal obstruction. International Surgery Journal. 2018;5(9):3072-7.
21. Derseh T, Dingeta T, Yusouf M, Minuye B. Clinical outcome and predictors of intestinal obstruction surgery in Ethiopia: a cross-sectional study. BioMed Research International. 2020;2020.
22. Deshmukh SN, Maske AN. Pattern of dynamic intestinal obstruction in adults at tertiary care centre. International Surgery Journal. 2016;3(2):492-6.
23. Souvik A, Hossein MZ, Amitabha D, Nilanjan M, Udipta R. Etiology and outcome of acute intestinal obstruction: A review of 367 patients in Eastern India. Saudi journal of gastroenterology: official journal of the Saudi Gastroenterology Association. 2010;16(4):285.
24. Kapan M. Mechanical bowel obstruction and related risk factors on morbidity and mortality. Journal of Current surgery. 2012.
25. Arshad Malik MS, RafiquePathan. South Gondar Zone Health Office. 2020.
26. Okello TR, Ogwang DM, Kisa P, Komagum P. Sigmoid volvulus and ileosigmoid knotting at St. Mary's Hospital Lacor in Gulu, Uganda. East and central African journal of surgery. 2009;14(2):58-64.
27. Atukorale YN, Church JL, Hoggan BL, Lambert RS, Gurgacz SL, Goodall S, et al. Self-expanding metallic stents for the management of emergency malignant large bowel obstruction: a systematic review. Journal of Gastrointestinal Surgery. 2016;20(2):455-62.
28. Abelson JS, Yeo HL, Mao J, Milsom JW, Sedrakyan A. Long-term postprocedural outcomes of palliative emergency stenting vs stoma in malignant large-bowel obstruction. JAMA surgery. 2017;152(5):429-35.
29. Halabi WJ, Jafari MD, Kang CY, Nguyen VQ, Carmichael JC, Mills S, et al. Colonic volvulus in the United States: trends, outcomes, and predictors of mortality. Annals of surgery. 2014;259(2):293-301.
30. Chakma N, Sarkar B, Sarkar P. A retrospective study of intestinal obstruction patients in AGMC & GBP Hospital, Tripura. Journal of Evolution of Medical and Dental Sciences. 2016;5(103):7531-4.
31. Tuca A, Guell E, Martinez-Losada E, Codorniu N. Malignant bowel obstruction in advanced cancer patients: epidemiology, management, and factors influencing spontaneous resolution. Cancer management and research. 2012;4:159.

32. Xuan NT, Son NH, Thien HH. Treatment outcome of acute intussusception in children under two years of age: a prospective cohort study. *Cureus*. 2020;12(4).
33. Markogiannakis H, Messaris E, Dardamanis D, Pararas N, Tzertzemelis D, Giannopoulos P, et al. Acute mechanical bowel obstruction: clinical presentation, etiology, management and outcome. *World journal of gastroenterology: WJG*. 2007;13(3):432.
34. Kumar S, Kafle P, Patowary B, Belbase N, Agrawal S, Shrestha S, et al. Surgical outcome and clinical profile of emergency versus elective cases of colorectal cancer in college of medical sciences, Nepal. *Journal of College of Medical Sciences-Nepal*. 2013;9(2):25-30.
35. Abdifatah DS, Gudina E. Intestinal obstruction surgical management outcome and associated factors in Gelemso general hospital, Oromia regional state, eastern Ethiopia: Harmaya University; 2016.
36. Okeny P, Hwang T, Ogwang D. Acute Bowel Obstruction in a Rural Hospital in Northern in Northern Uganda. *East and Central African Journal of Surgery*. 2011;16(1).

12 Appendixes

Check List

Date..... Serial No..... This Client document based checklist is to be filled by trained data collectors from patient's card, operation note registration books; that contains details on patient demographics, clinical features, supportive diagnostic tools, operative findings and outcomes ,Postoperative issues included in this check list for operatively managed bowel obstruction patients at Debre tabor comprehensive specialized Hospital during January82019toJanuary92021G.C.

1Backgroundofinformation

01. Sex Mal..... Female.....
02. Age.....
03. Address Urban Rural...
04. .Religion Christian..... Muslim..... Other...
05. .Marital status Single.....Married.....Divorcedothers
06. Occupation Civil
servant.....Merchant.....Driver.....Farmer.....others...

2. Preoperative Clinical characteristics

01, Duration of illness before reaching Debre Tabor comprehensive specialized Hospital

A, <24hours B, 24to48hours C, >48hours

02, .Duration of hospital stays before Surgery.

A, <24hous B, <48hours

03, Symptoms Yes No

A. Abdominal pain

B. Vomiting Yes..... No

C. Abdominal distension Yes..... No

D. Anorexia Yes..... No

E. Fever Yes..... No

F. Failure to pass Feces Yes..... No

G. Failure to pass Flatus Yes..... No

H. Failure to pass Urine Yes..... No

I. Shortness of Breath Yes..... No...

J. History of similar attack Yes..... No...

K. History of chronic illness Yes..... No.....

If yes illness is? A, Diabetes mellitus B. Hypertension C. HIV D. Asthma E. Liver
Disease F. Renal Disease G. Other Specify

04 signs

A, Sick looking Yes..... No.....

B, pulse Rate>100BPM Yes..... No.....

C, Systolic BP<90mmhg Yes..... No.....

D. Diastolic BP<60mmhg Yes..... No.....

E. Temperature>37.5 oc Yes..... No.....

F. Respiratory rate>20Br/PM Yes..... No.....

Saturation of O₂ with room air <95% Yes..... No.....

.Dry Buccal Mucosa Yes..... No.....

Abdomen Distended Yes..... No.....

Visible Peristalsis Yes..... No.....

Abdominal scar Yes..... No.....

Abdominal Tenderness Yes..... No.....

Abdominal Mass Yes..... No.....

Board like Tense abdomen Yes..... No.....

Free Hernia sites Yes..... No.....

Tender or empty Rectum Yes..... No.....

Client is Conscious Yes..... No.....

In shock at Arrival Yes..... No.....

05. Investigation

A, WBC between 4000-11000cellspermm

B, >11000cellspermm3

06 .Preoperative Working diagnosis

A. Simple small bowel obstruction

B. Simple large bowel obstruction

C. Gangrenous small bowel obstruction

D. Gangrenous Large bowel obstruction

07, Preoperative antibiotics initiated

A. Yes B, No

08. Nasogastric tube inserted

A. Yes b. No

09. Intravenous fluid Resuscitation started

A, Yes B, No

10. Previous abdominal surgery

A. Yes B. No

11. Intra-operative blood Transfusion

A. Yes B, No.....

12. Type of Anesthesia

A. Spinal B. epidural C. General

13. Surgical field Cleaned with

A. Alcohol B. Iodine C. Both

D. Not

14. Intra-operative diagnosis

A. Simple SBO B. Gangrenous SBO

C. Simple LBO D. Gangrenous LBO

15. Intra-operative Estimated blood Loss.

A. <250milliliter B. 250-500milliliter

C. 500-1000milliliter D. >1000Milliliter

16. Type of operative procedure

A. DE rotation B. REEA C. Stoma D. Adhesinolysis E. Reduction

17. Postoperative antibiotics

A. Continued B. Initiated

18. Antibiotics duration

A. <03Days B. 3-5Days C. >5day

19. Postoperative Vital sign follow up frequency per24hours

A. <4 B. >or4

20. Postoperative Hemodynamic status

A. Stable B. Unstable

21. Length of Hospital stays after surgery in Days

A. <6 B. ≥6

22 .Complications Developed by the patient postoperatively

A. Yes B. No

23. If yes for question NO 22, what type of complications?

A. SSI B. Anastomotic Leak C. Dehiscence D. Pneumonia E. Septic Shock
F. Hypokalemia G. Respiratory Failure H. Urinary tract Infection I. Death

24. Status of patient at discharge

A. Cured B. Improved C. complicated D. Dead

25. Treatment outcome

A. Good B. Poor



BAHIR DAR UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCE
DEPARTMENT OF INTEGRATED EMERGENCY SURGERY
AND OBSTETRICS

TREATMENT OUT COME AND ASSOCIATED FACTORS OF BOWEL
OBSTRUCTION AMONG PATIENTS TREATED SURGICALLY IN
DEBRE TABOR COMPREHENSIVE SPECIALIZED HOSPITAL, NORTH
WEST ETHIOPIA, 2022.

BY: GETIYE MIHIRETIE (BSc)

A RESERCH PAPER SUBMITTED TO BAHIR DAR UNIVERSITY,
COLLEGE OF MEDICINE AND HEALTH SCIENCES, DEPARTMENT OF
INTEGRATED EMERGENCY SURGERY AND OBSTETRICS IN
PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE
OF MASTERS IN INTEGRATED EMERGENCY SURGERY AND
OBSTETRICS.



BAHIR DAR, ETHIOPIA

AUGUST 2022

የትምህርት ሚኒስቴር
Ministry of Education

የትምህርት ሚኒስቴር
Ministry of Education