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BAHIR DAR UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCES

SCHOOL OF MEDICINE

DEPARTMENT OF INTEGRATED EMERGANCY SURGERY AND OBSTETRICS

OPERATIVE TREATMENT OUTCOMES OF BOWEL OBSTRUCTION AND ASSOCIATED FACTORS IN DEBRE TABOR COMPREHENSIVE SPECALIZED HOSPITAL, NORTH CENTRAL ETHIOPIA

PRINCIPAL INVESTIGATOR :- YITAYIH BELAY

BSC IN PUBLIC HEALTH OFFICER

AUGUST 2021

ETHIOPIA

BAHIR DAR UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCES

SCHOOL OF MEDICINE

DEPARTMENT OF INTEGRATED EMERGANCY SURGERY AND OBSTETRICS

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

ADVISORS: - Mr. KEBADNEW MULATU, ASSISTANT PROFESSOR OF EPIDEMIOLOGY

: - Dr YESHAMBEL GETIE, ASSISTANT PROFESSOR OF SURGERY

AUGUST 2021

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,2021,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, assistance and help I received during the course of this investigation have been acknowledged.

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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 Yitayih Belay 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.

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Acknowledgment

I would like to express my deepest gratitude to my Advisor's Mr. Kebadnew Mulatu (Assistant professor of epidemiology) and Dr Yeshambel Getie (Assistant professor of surgery) for their indispensable comments and suggestions in the preparation of this research report.

I am greatly indebted to Department of Integrated Emergency Surgery and Obstetrics for giving me the opportunity to conduct this research.

I would also like to thank all staffs of Debre Tabor comprehensive specialized hospital and Data collectors for providing me relevant information and helped me to collect data.

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.

Aim: The aim of this study was to assess the Operative treatment out comes of bowel obstruction and associated factors in Debre Tabor comprehensive specialized hospital north Central Ethiopia 2021.

Methods: Institution based cross sectional study with patients' chart revision was conducted among operatively managed bowel obstruction cases during January 09 2019 to January 08 2021.The charts of patients were selected using a systematic random sampling technique. A structured research tool was used to collect all the necessary data from the patients' medical records. the data were analyzed by using SPSS version 25. Frequencies with percentages were used to describe the surgical management outcome of Bowel obstruction. Simple Binary logistic regression and Multiple binary logistic regression model was used to explore the determinant factors associated with the surgical management outcome of Bowel obstruction. Factors at P<0.25 From simple binary logistic regression and P<0.05 from multiple binary logistic regression were declared statically significant.

Result:68.4% patients have Good surgical management outcomes of Bowel obstruction, whereas the rest 31.6 % patients have Poor outcomes. Age (AOR: 7.47, 95 CI: (4.57-11.57)), Shock on Arrival (AOR: 11.83, 95 CI: (6.23-15.36)), Preoperative diagnosis (AOR: 15.39, 95 CI:(12.02–20.93)), Blood Transfusion(AOR:46.71, 95CI: (39.56-48.60)), Intraoperative vital sign(AOR: 7.65, 95 CI: (6.88-14.60)), and postoperative vital sign(AOR: 86.68, 95 CI: (79.21-91.08)), were significantly associated.

Conclusion: In this study, good surgical management outcomes of Bowel obstruction is lower, and the proportion of patients with poor outcomes was higher. Thus, designing a strategy addressing the significantly associated factors could help to decrease poor surgical management outcome.

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
BO	Bowel obstruction
DD	Derotation and Decompression
MBO	Mechanical Bowel Obstruction
RA	Resection and Anastomosis
SOP	standard operating procedure
PI	Principal investigator
SV	Sigmoid Volvuls

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1. Introduction

1.1. Background

Bowel obstruction constitutes about 10 percent of all non-trauma surgical emergencies. Adhesion s, neoplasm, hernia and volvuls 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 volvuls whereas adhesion s 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 Debretabor 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 health care.

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 factors[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 is to be conducted on similar health institutions around selected countries in the world including Ethiopia.

2. Literature reviews

2.1.Treatment out comes

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, volvuls, and acute biliary pathology remain the most common causes of the acute abdomen in adults [11, 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 ileocolic anastomosis was performed, while for a lesion in the left colon a resection and primary colocolic anastomosis was performed after intraoperative judgement. 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 decompressor 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 rectosigmoid 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-microbials 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 perecnt 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 non operatively. After successful expectant management was done in 24 percent patients planned surgery helps for good treatment outcomes[18].

Good treatment outcomes of bowel obstruction who underwent for Operative Treatment improves the economical 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,fascial 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 sociodemographic characteristics of the study participants, the knowledge and skill of the health professionals regarding the diagnosis and management of bowel obstruction, 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 followup of patients who came 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 northwestern 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 (1and 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 an 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 mandatory[12].

Small bowel obstruction was more prevalent than large bowel obstruction. Intussusception and sigmoid volvuls 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 9.87 percent 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 1. 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. Morbidity rate was 41.9 percent, and 12.8 percent of the patients had died[24].

Discharge rates were maximum in patients of adhesion and minimum in patients of volvuls. 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 minimum [25].

Sigmoid volvuls is relatively rare in our community. It commonly affect 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 within 1 year[28].

Colonic volvuls 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 volvuls and sigmoid volvuls affect different populations and the incidence of colonic volvuls 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 duration of illness, 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 contributes to the outcomes of surgically treated bowel obstruction could be sociodemographic characteristics,Life style characteristics,preoperative clinical characteristics, intraoperative clinical characteristics,postoperative clinical characteristics,length of hospital stay [8].

2.2.1.Sociodemographic 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 inoperable 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 affects 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 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 helps 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 ischaemia, 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 ischaemia, 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 out comes[12].

Gangrenous sigmoid volvuls was the leading specific intraoperative clinical diagnosis of bowel obstruction, followed by simple small bowel volvuls, gangrenous small bowel volvuls, adhesion and band, intussusception, and simple sigmoid volvuls 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 out comes[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 out come.

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 out come 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 Debretabor comprehensive specialized hospital.

3. Conceptual Frame work

This conceptual frame work is adopted from different literature's reviewed and compiled from different sources.

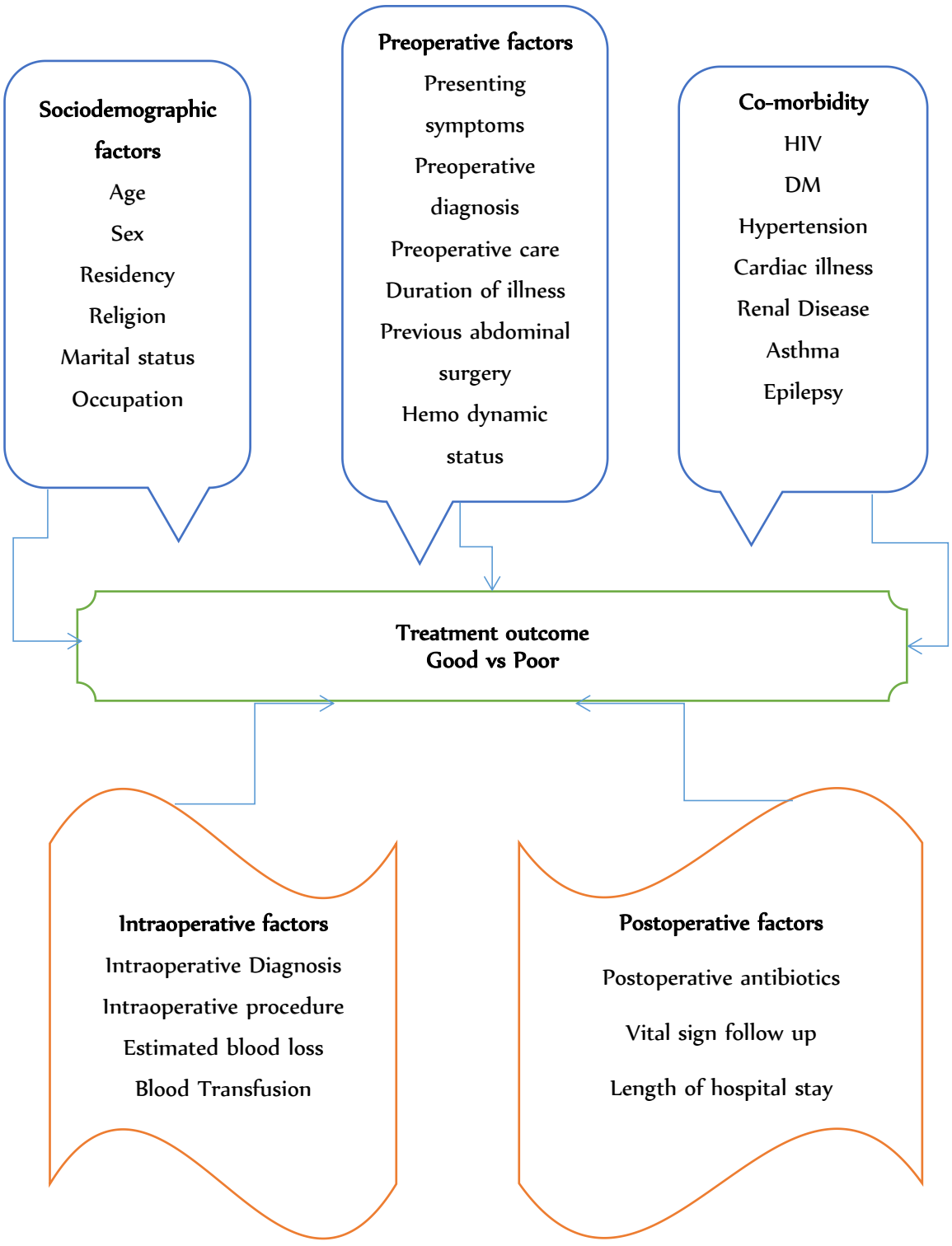

Figure 1 Conceptual frame for the study on surgical management out come of bowel obstruction and associated factors in DTCSH,North central Ethiopia

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. Methods

5.1. Study area and period

This study was conducted In Debre Tabor comprehensive specialized hospital in Debr 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.

Debre Tabor comprehensive specialized Hospital has a bed capacity of 163, out of this 31 belongs to the surgical ward. In this ward there are Ten general surgeons, Five IESOs, 10 general practitioners, 17 nurses and also in operation room 12 anesthetics and 9 nurses giving care for surgical patients. It also has laboratory and x-ray facilities.

This study was conducted from April 08 2021 to August 06 2021 by reviewing operatively treated bowel obstruction Patient Charts and Operation room Registration books by using structured Checklist during the past 24 months since January 09 2019 to January 08-2021 in Debretabor 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 during January 9 2019 to January 08 2021 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 Debretabor comprehensive specialized Hospital.

5.4.Study population

The study populations comprised of all patients with Operatively Treated Bowel obstruction in Debretabor 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 9 2019 G.C to January 08 2021 was included in the study.

5.5.2. Exclusion Criteria

Incomplete or Lost record over the data of interest was excluded from the study.

5.6. Sample size and Sampling technique

5.6.1. Sample Size

Sample size was taken from first objective, as it was greater than the one calculated by second objective, which was calculated by using single population proportion formula,$n_i=(z_{@/2}^2 Xp(1-p))/d^2=(1.96X1.96)X(0.833)X(1-0.833)/(0.04X0.04)=354$,with considering the following assumptions. Z=1.96, P =83.3% from similar study[8] and d=4%. z is the value of standard normal distribution curve at the 96% level of confidence, p is the proportion of good out come for operatively Treated Bowel obstruction, d is the margin of error.

5.6.2.Sampling

Simple Random sampling technique From a sampling frame of 396 patient charts was used to select study participants.For this purpose Operatively managed Bowel obstruction cases during January 9 2019 to January 08 2021 was listed using medical record number that was given numbers and lottery method was used.If any selected patient Chart is recognized with missed or incomplete for the data, were replaced by the next non sampled Chart of the listed frame of reference.

5.7 .Variables

5.7.1 Dependent variable

- Operative Treatment outcome(Good or Poor)

5.7.2 Independent variables

Table 1: In dependant variables

Sociodemographic	**Preoperative**	**intraoperative**	**postoperative**
Age	Duration of illness	Intraoperative diagnosis	Postoperative antibiotics
Sex	Co morbidity	Intraoperative procedure	Length of hospital stay
Residence	Preoperative care	Estimated Blood loss	Vital sign follow up
Religion	Preoperative diagnosis	Blood transfusion	
Occupation	Presenting symptom		
Marital status	Hemo dynamic status		

5 .8. Operational definitions

- Acute Abdomen is an abdominal condition of sudden onset that may require immediate operative treatment[34].
- Bowel obstruction is partial or complete blockage of the Bowel producing symptoms of vomiting, constipation, distension and abdominal pain[10].
- Operative treatment is Management of bowel obstruction via Laparotomy.

- Leukocytosis – laboratory founding of WBC >10,000/mm^3[9].
- 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.
- 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].
- Surgery success rate: the proportion of clients managed surgically and discharged on improvement to total number of surgical operations of same diagnosis in this study bowel obstruction.

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 simple random sampling. By using structured Checklist Data was collected by two trained nurses who was supervised by two second year IESO students. The data collected was submitted to me on Daily basis for completeness check up and any other concern.

5.10. Data entry, 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. Simple binary logistic regression model was used to select the independent variables associated with the surgical management outcome of Bowel obstruction. All factors with a P value <0.25 in the simple binary logistic regression analysis were considered

as a candidate to be entered into the Multiple binary 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 a 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 cross matched.

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. Sociodemographic Characteristics.

A total of 354 patients who had a history of surgery for Bowel obstruction at Debre Tabor comprehensive specialized Hospital were included and finally analyzed in this study. 104(29.3%) were <30 years old,250(65.3%) were between 30 and 70 years old the largest age group and 19(5.4 %) were above 70 years old. The minimum age of the patients was 4 days old and the maximum was 89 years.The majority 281(79.4%) of patients were males , with a male-to-female ratio of 3.8 :1.Among the total patients, 294(83.1%) of them were rural dwellers, 241(68.1%) married, 316(89.3%) orthodox, and 226(63.8%) farmers.

Table 2: Sociodemographic characteristics of Bowel obstruction patients (N = 354) at Debretabor comprehensive specialized hospital, Ethiopia.

Variable	Category	Frequency	Percent
Age in Years	<15	56	15.8
	16-29	48	13.5
	30-49	107	30.2
	50-69	124	35
	>69	19	5.4
Sex	Male	281	79.4
	Female	73	20.6
Residence	Urban	60	16.9
	Rural	294	83.1
Marital status	Single	33	9.3
	Married	241	68.1
	Divorced	13	3.7
	Others	67	18.9
Religion	Orthodox	316	89.3
	Protestant	15	4.2
	Muslim	23	6.5
Occupation	Civil servant	12	3.4
	Merchant	18	5.1
	Driver	4	1.1
	Farmer	226	63.8
	Others	94	26.6

6.2 Preoperative Clinical Characteristics

The findings show abdominal pain 322(91%), vomiting 305(86.2%), abdominal distension 317 (89.5%), and failure to pass abdominal contents,such as feces and/or flatus, 272(76.8%) are the leading clinical symptoms among patients presenting with bowel obstruction at the health care facility.15(4.2 %) were with known chronic illness like cardiovascular diseases, lung diseases, diabetes mellitus, or other chronic disorders as documented in their medical records,118(33.3 %) with unstable vital sign on arrival,83(23.4) % in shock on arrival,(155)43.8% with history of previous abdominal surgery,(155)43.8% with abdominal tenderness,200(56.5%) with Leukocytosis and 216(61.0%) start therapeutic antibiotics with the most common specific preoperative clinical diagnosis of the patients was simple SBO 125(35.3%) followed by gangrenous SBO 79(35.3%) and simple LBO 75(21.2%) which equals Gangrenous LBO 75(21.2%).

Regarding the duration of illness, 93(26.3%) cases are presented with in 24 hours after the onset of Bowel obstruction symptoms and 52(14.7 %) presented after 96 hours of onset of symptoms and signs.307(86.7 %) under goes surgery with in 12 hours after diagnosis and 30(8.5 %) after 72 hours of diagnosis.

Concerning the key elements of preoperative care assessed in this study, IV fluid resuscitation was given for all patients; NG tube was inserted for all patients; and preoperative antibiotics was initiated generally for ,138(39.1%) as prophylactic and 216(60.9 %) Therapeutic, all patients with a combination of ceftriaxone and metronidazole.

Table 3: Preoperative characteristics of Bowel obstruction patients (N = 354)
at Debretabor comprehensive specialized hospital, Ethiopia.

Variable	Category	Frequency	Percent
Presenting symptom	Abdominal Pain	322	91
	Abdominal Distension	317	89.5
	Vomiting	305	86.2
	Fever	138	39
	Failure to pass	272	76.8
Preoperative Diagnosis	Simple SBO	125	35.3
	Gangrenous SBO	79	22.3
	Simple LBO	75	21.2
	Gangrenous LBO	75	21.2

Variable	Category	Frequency	Percent
Preoperative care	Antibiotics	354	100
	Prophylactic	138	39.0
	Therapeutic	216	61.0
	IV fluid started	354	100
	Vital sign checked	354	100
Duration of illness in hours	Less than 24 Hours	93	26.3
	24-48 Hours	79	22.3
	49-72 Hours	77	21.8
	73-96 Hours	53	15.0
	Greater than 96 Hours	52	14.7
Co morbidity	no	339	95.8
	RVI	5	1.4
	DM	5	1.4
	Others	4	1.1
	cardiac Disease	1	.3
Previous Abdominal surgery	Yes	155	43.8
	No	199	56.2
Duration of hospital stay before surgery	Less than 12 Hours	307	86.7
	12-24 Hours	1	.3
	25-48 Hours	7	2.0
	49-72 Hours	9	2.5
	Greater than 72 Hours	30	8.5
Vital sign on arrival	Stable	236	66.7
	Unstable	118	33.3
Shock on arrival	Yes	83	23.4
	No	271	76.6
Abdominal Tenderness	Yes	155	43.8
	No	199	56.2
Leukocytosis	Yes	200	56.5
	No	154	43.5

6.3 Intraoperative Clinical Characteristics

Simple small bowel obstruction 128(36.2%)was the leading cause of bowel obstruction diagnosed Intra operatively followed by ,Gangrenous Large bowel obstruction 65(18.4%),Simple Large bowel obstruction79(22.3%),and Gangrenous Small bowel obstruction 82(23.2%).

Among 354 patients who undergo for laparotomy 79(22.3 %) were with unstable vital sign Intra operatively. The commonest specific type of intraoperative procedure done, after a general laparotomy, to treat the patients with bowel obstruction was resection and anastomosis149(42.1%). Intra operatively 30(8.4 %) of patients experienced >500 ml of blood loss those who require blood transfusion were 40(11.3%).

Table 4: Intraoperative characteristics of Bowel obstruction patients (N = 354) at Debretabor comprehensive specialized hospital, Ethiopia

Variable	Category	Frequency	Percent
Vital sign	Stable	275	77.7
	Unstable	79	22.3
Estimated Blood loss	Less than 250 ml	151	42.7
	250 -500 ml	173	48.9
	501-750 ml	27	7.6
	751-1000 ml	3	0.8
Intraoperative diagnosis	Simple SBO	128	36.2
	Gangrenous SBO	65	18.4
	Simple LBO	79	22.3
	Gangrenous LBO	82	23.2
Operative procedure Done	Reduction	41	11.6
	Derotation	76	21.5
	Adhesiolysis	32	9.0
	Resection and Anastomosis	149	42.1
	Stoma	56	15.8

6.4 Postoperative Clinical Characteristics

One hundred twenty seven (35.9%) were with unstable vital sign. 170(48 %) of patients took antibiotics for more than 7 days and those who took 5-7 days were 33(9.3%) percent while 151(42.7 %) took for <5 days.

The most common post operative complication were Surgical site infection49(13.8%) followed by Death 22(6.2%),leak15(4.2%),Dehiscence 13(3.7%),Respiratory tract infection 12(3.4%). 62(17.5 %) patients stayed in the hospital for >14 days while majority of patients 147(41.5%) average length of hospital stay was 7 to 10 days followed by 10-14 days 115(32.5%).among deaths occurred 1(0.28%) was on table while majority of patients discharged improved 312(88.1%), with complications 3(0.8) and cured 17(4.8%).

Table 5 Postoperative clinical characteristics of Bowel obstruction patients (N = 354) at Debretabor comprehensive specialized hospital, Ethiopia

Variable	Category	Frequency	Percent
Vital sign	Stable	227	64.1
	Unstable improving	103	29.1
	Unstable deteriorating	24	6.8
Duration of Antibiotics	Less than 5 Days	151	42.7
	5-7 Days	33	9.3
	Greater than 7 Days	170	48.0
Postoperative complications	Surgical site infection	49	13.8
	leak	15	4.2
	Dehiscence	13	3.7
	RTI	12	3.4
	death	22	6.2
Status at Discharge	Cured	17	4.8
	Improved	312	88.1
	Complicated	3	.8
	Dead	22	6.2
Length of Hospital stay	Less than 3 Days	8	2.3
	3 -6 Days	22	6.2
	7-10 Days	147	41.5
	11-14 Days	115	32.5
	Greater than 14 Days	62	17.5

6.5 Treatment out come

This study shows 112 (31.6%) have poor surgical management outcomes whereas the rest 242 (68.4%) patients have Good outcomes and the overall success rate of the surgery is 329 (92.9%).

Table 6: Treatment outcome of Bowel obstruction patients (N = 354) at Debretabor comprehensive specialized hospital, Ethiopia

Variable	Category	Frequency	Percent
Treatment Out come	Good	242	68.4
	Poor	112	31.6
Discharge status	Cured	17	4.8
	Improved	312	88.1
	Complicated	3	.8
	Dead	22	6.2

6.6 Factors associated

From the simple binary logistic regression analysis, factors including Age, duration of illness, Fever, Vital sign on arrival, Shock on arrival, Abdominal tenderness, preoperative diagnosis, type of intraoperative procedure done, Estimated blood loss, Blood Transfusion, Intra operative vital sign, Postoperative vital sign, Duration of antibiotics and length of hospital stay were associated with the surgical management outcome of Bowel obstruction.

Subsequently, all these factors were entered into the multiple binary logistic regression model. In the multiple binary logistic regression analysis, Factors significantly associated with the surgical management outcome of Bowel obstruction were Age, Shock on arrival, Preoperative Diagnosis, Intra operative vital sign, Blood transfusion, and postoperative vital sign.

The patients who are 60 years and older were about 7 times more likely to have poor outcome than younger patients (AOR = 7.47; 95% CI:4.57–11.57; P = 0.012).The patients who were presenting with Shock were about 12 times more likely to have poor outcome than those who were not presenting in shock on arrival(AOR= 11.83; 95% CI: 6.23–15.36; P < 0.001).The patients with preoperative diagnosis of

Gangrenous small bowel obstruction were about 15 times more likely to have poor outcome than those with simple small bowel obstruction(AOR= 15.39; 95% CI:12.02–20.93; P = 0.008).The patients with Gangrenous Large bowel obstruction were about 8 times more likely to have poor outcome than those with simple small bowel obstruction(AOR= 7.72; 95% CI:5.17–14.77; P = 0.033).The patients with blood transfusion Intra operatively were about 47 times more likely to have poor outcome than those with no transfusion(AOR= 46.71; 95% CI:39.56–48.60; P = 0.003).the patients with Unstable Intra operative vital sign were about 8 times more likely to have poor outcome than those who were stable(AOR= 7.65; 95% CI:6.88–14.16; P = 0.004).The patients with Unstable Postoperative vital sign were about 87 times more likely to have poor outcome than those with stable vital sign(AOR= 86.68; 95% CI:79.21-91.08; P < 0.001).

Table 7: Factors associated with the surgical management outcome of BO at DTCSH, Ethiopia.

Variables	**Category**	**Outcome**		**COR (95%CI)**	**AOR (95%CI)**
		Good	Poor		
Age	>60	43	42	17.9(15.50-28.02)	7.47(4.57-11.57)
	<60	199	70	1	1
Vital sign on arrival	Unstable	27	91	34.5(30.54-44.19)	5.42(4.60-8.72)
	Stable	215	21	1	1
Arrived with Shock	Yes	9	74	50.4(45.2-59.12)	11.83(6.23-15.36)
	No	233	38	1	1
Preoperative Diagnosis	Gangrenous SBO	45	34	59.9(49.38-62.12)	15.39(12.02–20.93)
	Simple LBO	67	8	9.47(3.77-13.76)	2.98(0.677-13.13)
	Gangrenous LBO	19	56	23.36(20.913-29.04)	7.72(5.17–14.77)
	Simple SBO	111	14	1	1
Blood Transfusion	Yes	2	38	61.62(54.52-61.54)	46.71(39.56-48.60)
	No	240	74	1	1
Intraoperative vital sign	Unstable	9	70	43.15 (40.02 -52.99)	7.65(6.88-14.60)
	Stable	233	42	1	1
Postoperative vital sign	Unstable	28	99	44.09(41.51-89.54)	86.68(79.21-91.08)
	Stable	214	13	1	1

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 31.6% of cases had poor surgical management outcomes. The finding of this study was slightly lower than the findings from a study conducted in Gelemso General Hospital Eastern Ethiopia which is 32.8%[35], but it is Higher than the studies from North west Ethiopia and southeastern Ethiopia, 16.7% in University of Gondar comprehensive specialized Hospital[8] and 24.6% in Adama Hospital [11], and also slightly higher 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 sociodemographic characteristics of the study participants, the Perioperative characteristics of the study participants, the knowledge and skill of the health professionals regarding the diagnosis and management of Bowel obstruction, 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 Age, Shock on arrival, Preoperative Diagnosis, Intra operative vital sign, Blood transfusion, and postoperative vital sign, were factors significantly associated with the surgical management outcome of Bowel obstruction.

The patients seeking health care for Bowel obstruction who are 60 years and older were about Seven times more likely to have poor outcome than those seeking health care who are younger than 60 Years. 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 are older might be due to delayed perception of Bowel obstruction symptoms, Fear of complaining to their care givers early, Lack of accompanying Family member and Senescence related weakened immunity. this result implied that elders are more affected by bowel obstruction management complication for this the community needs health education on the symptoms, signs and duration effect of bowel obstruction to actively participate in health seeking for the symptoms and older in special care. the

government might play a role in helping the elders while they are healthy by working for their health in group or individually.

This study also showed the patients presenting with Shock were about Twelve times More likely to have poor outcome than those who were not in shock on arrival. 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 eight times 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 audiological investigations. the institution shall always avail complete blood count, Radiology service including sonography, Proctoscope, anoscope, sigmoidoscope, 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 other factor associated to surgical management outcome of Bowel obstruction is the patients with blood transfusion Intra operatively were about forty-seven times 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 out come 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 Hemo dynamic 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 over load 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 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, 37].

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 Per fusion 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 be the institution not to cause hypothermia in turn causes hypotension.

The patients with Unstable Postoperative vital sign were about eighty seven times more likely to have poor outcome than those with stable Postoperative Vital sign and this result is in line with studies in Ethiopia[14] and Rwanda[37].

It might be Due to unstable postoperative 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.it could be sequential result of unstable Intra operative vital sign or new onset due to patient or management factor.

Staffs who are assigned to follow postoperative patients to follow every 15 minutes for 2 hours, every 30 minutes for 2 hours, and every 1 hour for 4 hours with appropriate intervention. the physician who operate on 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 intranasal oxygen, Face masks, Beds, emergency drugs and enough table to keep then for 8 hours.

8.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.

9.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 Age, Shock on arrival, Preoperative Diagnosis, Blood transfusion, Intra operative vital sign and Postoperative Vital sign 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.

10. 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.

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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 Debretabor comprehensive specialized Hospital during January 8 2019 to January 9 2021 G.C.

1 Background of information

001 . Sex Male……..

Female…….

002. Age ……

003. Address Urban …… Rural……

004 .Religion Christian…… Muslim …… Others ……

005. Marital status Single…….Married ……..Divorced ……..… others……

006.Occupation Civil servant…….. Merchant …….

Driver …….. Farmer…… others……

2. Preoperative Clinical characteristics

007. Duration of illness before reaching Debre Tabor comprehensive specialized Hospital <24 hours…… 24 to 48 hours… >48 hours……

008 . Duration of hospital stay before Surgery. <24 hour……. <48 hours……

009.Abdominal pain Yes…… No……

010. Vomiting Yes…….. No……

011. Abdominal distension Yes…… No……

012. Anorexia Yes…… No……

013. Fever Yes…… No……

014.Failure to pass Feces Yes…… No……

015.Failure to pass Flatus Yes…… No……

016.Failure to pass Urine Yes…… No……

017.Shortness of Breath Yes…… No……

018.History of similar attack Yes…… No……

019.History of chronic illness Yes…… No……

Specify for yes ……

020.Sick looking Yes…… No……

021. pulse Rate >100 BPM Yes…… No……

022 .Systolic BP<90 mmhg Yes…… No……

023. Diastolic BP<60 mmhg Yes…… No…… 024.

Temperature >37.5 ^{o}c Yes…… No……

025.Respiratory rate >20 BrsPM Yes…… No……

026.Saturation of O_2 with room air <95 % Yes…… No……

027. Dry Buccal Mucosa Yes…… No……

028.Abdomen Distended Yes…… No……

029.Visible Peristalsis Yes…… No……

030. Abdominal scar Yes…… No……

031.Abdominal Tenderness Yes…… No……

032.Abdominal Mass Yes…… No……

033.Board like Tense abdomen Yes…… No……

034.Free Hernial sites Yes…… No……

035.Tender or empty Rectum Yes…… No……

036.Client is Conscious Yes…… No……

037.In shock at Arrival Yes…… No……

038. WBC between 4000-11000 cells per mm^3…… >10000 cells per mm^3……

039.Preoperative Working diagnosis.

Simple small bowel obstruction…….

simple large bowel obstruction…….

Gangrenous small bowel obstruction……..

Gangrenous Large bowel obstruction……..

040. Preoperative antibiotics initiated Yes…… No……

041.Nasogastric tube inserted Yes…… No……

042.Intra venous fluid Resuscitation started. Yes…… No……

043. Previous abdominal surgery. Yes…… No……

3.Intraoperative Clinical characteristics

044.Intraoperative blood Transfusion. Yes…… No……

045.Type of Anesthesia

Spinal……..epidural……General…….

046.Surgical field Cleaned with

Alcohol……..Iodine……Both……..Not……

047.Intraoperative diagnosis.

Simple SBO……

Gangrenous SBO…….

Simple LBO…….…

Gangrenous LBO……..……

048.Intra operative Estimated blood Loss.

<250 milliliter……..250-500 milliliter…….

500-1000 milliliter…… >1000 Milliliter……

049.Type of operative procedure.

Derotation……..REEA……..Stoma……

Adhesiolysis…….Reduction……

3.Postoperative Clinical characteristics

050. Postoperative antibiotics Continued or Initiated Yes… No…..

051.Antibiotics duration <03 Days……..3-5 Days ……. > 5 days……

052.Postoperative Vital sign follow up frequency per 24 hours <4...> or = 4 …

053.Postoperative Hemo dynamic status. Stable……..Unstable……

054.Length of Hospital stay after surgery in Days <6… > or = 6…

055.Complications Developed by the patient Post operatively.If They develop more than one complication please select all complications.

SSI……Anastomotic Leak…. Dehiscence…….Pneumonia…….Septic Shock……Hypokalemia……Respiratory Failure……Urinary tract Infection……Death……..No complication……..

056.Status of patient at discharge.

Cured……Improved…….complicated…… Dead…….

057 Treatment outcome Good…… Poor……