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# Perforated Peptic Ulcer Disease and Associated Factors Among Adult Patients with Non Traumatic Acute Abdomen Who Were Admitted and Operated at Debre Tabor Comprehensive Specialized Hospital, North Central Ethiopia, 2022 Gc.

Dagninet, Alemu

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**BAHIR DAR UNIVERSITY**

**COLLEGE OF MEDICINE AND HEALTH SCIENCES**

**SCHOOL OF MEDICINE**

**Perforated Peptic Ulcer Disease and Associated Factors Among Adult Patients with Non Traumatic Acute Abdomen Who Were Admitted and Operated at Debre Tabor Comprehensive Specialized Hospital, North Central Ethiopia, 2022 Gc.**

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**AUGUST, 2022**

**BAHIR DAR, ETHIOPIA**

BAHIR DAR UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCES

DEPARTMENT OF Integrated Emergency Surgery and Obstetrics

A RESEARCH THESIS SUBMITTED TO BAHIR DAR UNIVERSITY  
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(OBSTETRICS, GYNECOLOGY& GENERAL SURGERY)

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PROJECT TITLE	PROPORTION OF PERFORATED PEPTIC ULCER DISEASE AND ASSOCIATED FACTORS AMONG ADULT PATIENTS WITH NON TRAUMATIC ACUTE ABDOMEN WHO WERE ADMITTED AND OPERATED AT DEBRE TABOR COMPREHENSIVE SPECIALIZED HOSPITAL.
TOTAL BUDGET	20,370 (Twenty thousand three hundred seventy Ethiopian birr)
STUDY PERIOD	JANUARY To July,2022
PROJECT AREA	Debre Tabor Comprehensive Specialized Hospital Amhara, North central, Ethiopia

## CANDIDATE’S DECLARATION FORM

This is to certify that the thesis entitled on“perforated peptic ulcer disease and associated factors among adult patients with non traumatic acute abdomen who were admitted and operated at Debre Tabor Comprehensive Specialized Hospital from January 2020 to January 2022”, submitted in partial fulfillment of the requirements for the degree of Master of Science in 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 institution to get any other degree of certificates. The articles are properly cited,results are accordingly discussed,assistance and help I received during the course of this investigation have been duly acknowledged.

.....

Name of the candidate

Date

Place

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**AND OBSTETRICS**

Advisor's Thesis Approval Form

Approval of Dissertation/Thesis for defense

I hereby certify that I have supervised, read and evaluated this thesis /dissertation titled on “perforated peptic ulcer disease and associated factors among adult patients with non traumatic acute abdomen who were admitted and operated at Debre Tabor Comprehensive Specialized Hospital from January 2020 to January 2022” by Dagninet Alemu prepared under my guidance. I recommend the thesis report be submitted for desertion.

Advisor's name	Signature	Date
1.....	.....	.....
2.....	.....	.....

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**AND OBSTETRICS**

**Examiner’s Thesis Report Approval Form**

We hereby certify that we have examined this dissertation/thesis entitled “perforated peptic ulcer disease and associated factors among adult patients with non traumatic acute abdomen who were admitted and operated at Debre Tabor Comprehensive Specialized Hospital from January 2020 to January 2022” by Dagninet Alemu. We recommend and approve the dissertation/thesis a degree of “Master of Science in Integrated Emergency Surgery and Obstetrics”.

**Board of Examiners**

.....	.....	.....
External examiner’s name	Signature	Date
.....	.....	.....
Internal examiner’s name	Signature	Date
.....	.....	.....
Chair person’s name	Signature	Date

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## ABSTRACT

**Background:** Peptic ulceration occurs due to acid peptic damage to the Gastroduodenal mucosa, resulting in mucosal erosion that exposes the underlying tissues to the digestive action of Gastroduodenal secretions. It affects 4 million people worldwide annually and its lifetime prevalence in patients with Peptic ulcer disease is about 5%.

**Objective:** The objective of the study is to assess the proportion and associated factors for perforated peptic ulcer disease among adult patients with non-traumatic acute abdomen who were admitted to surgical ward and operated at Debre Tabor Comprehensive specialized Hospital from January 2020 to January 2022 G. C

**Methods:** Hospital based retrospective cross sectional study was conducted at Debre Tabor Comprehensive specialized Hospital from January 2020 to January 2022 G. C on 455 adult patients with non-traumatic acute abdomen who were admitted to surgical ward and operated. 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 Peptic ulcer disease and associated factors among non traumatic acute abdomen. The bivariable and multivariable logistic regression model was used to explore the determinant factors associated with peptic ulcer disease among non traumatic acute abdomen. Factors at  $P < 0.25$  from bivariable and  $P < 0.05$  from multivariable were declared statistically significant. .

**Results:** A total of 455 cases were studied. Of which, 53.0%, 22.2%, 10.8% and 8.8% of the cases were acute appendicitis, small bowel obstruction, large bowel obstruction and perforated PUD respectively. Males were 75.0% (30/40) and outnumbered females by a ratio of 3: 1. Their mean age at presentation was  $31.85 \pm$  SD of 12.7 years. All of the perforations were located on the first part of the duodenum in 100% of the cases and becomes the fourth commonest cause of acute abdomens next to acute appendicitis and small bowel obstruction. The factors significantly related to perforation were males, history of dyspepsia, drinking alcohol and treatment delay ( $P < 0.001$ ).

**Conclusion:** Acute perforation of peptic ulcer continue as one of the real emergency condition in Debre Tabor Comprehensive Specialized Hospital requiring immediate attention and prompt operation. It develop twenty one, twenty five and twenty eight times on dyspeptic, alcohol drinkers and late presenters respectively. Thus, people with such behaviour must inform about this by health education and enforce to bring life style change to get out of risk.

## **ABBREVIATIONS AND ACRONYMS**

**BSC** Bachelor of Science

**DTCSH** Debre Tabor Comprehensive Specialized Hospital

**MPH** Master of Public Health

**NSAID** Non-Steroidal Anti-inflammatory drug

**MSc** Master of science

**OR** Odd Ratio

**P-value** Probability value

**PI** Principal Investigator

**PPI** Proton pump Inhibitors

**PPU** Perforated Peptic Ulcer

**PUD** Peptic Ulcer Disease

**SPSS** Statistical Package for Social Science

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# **1. Introduction**

## **1.1 Background**

Peptic ulcer occurs due to acid peptic damage to the Gastroduodenal mucosa, resulting in mucosal erosion that exposes the underlying tissues to the digestive action of Gastroduodenal secretions. Peptic ulcer disease (PUD) results from an inequality of acid secretion and mucosal defenses that resist acid digestion(1).

PUP occurs in 2% - 10% of patients with ulcer disease, it is the second most frequent complication after bleeding (2). Gastroduodenal perforation, with leakage of alimentary contents into the peritoneal cavity, is a common surgical emergency associated with morbidity and mortality in 50% and 30% of cases respectively (3, 4). PUP present as acute abdominal emergency conditions, with localized or generalized peritonitis and a high risk for further development of sepsis and death (5).

Peptic ulcer disease (PUD) represents a worldwide health problem because of its high morbidity, mortality and economic loss (1). It affects 4 million people worldwide annually (6, 7) and its lifetime prevalence in patients with PUD is about 5% (1).

Perforated peptic ulcer (PPU) is a serious complication of PUD and patients with PPU often present with acute abdomen that carries high risk for morbidity with its mortality ranges from 1.3% to 20% [4, 5]. Thirty-day and 90-day mortality rate have been reported 20% and 30%, respectively (1).

The pattern of perforated PUD has been reported to vary from one geographical area to another depending on the prevailing socio-demographic and environmental factors. In the developing world, the patients are younger age, male predominance, present later, and there is a strong association with smoking (8). In the west, patients tend to be elderly and there is a high incidence of ulcerogenic drug ingestion (1).

The natural history of peptic ulcer disease ranges from spontaneous resolution without intervention to development of life threatening complication such as bleeding and perforations. Perforated peptic ulcer is the 2nd most common ulcer related emergency following bleeding (1).

Perforated peptic ulcer is a surgical emergency and is associated with short-term mortality in up to 30% of patients and morbidity in up to 50% (1).

Worldwide variations in demography, socioeconomic status, *Helicobacter pylori* prevalence, and prescription drugs make investigation into risk factors for perforated peptic ulcer difficult (6).

Peptic ulcer related morbidity and mortality decreased in the western world since the mid-twentieth century especially in the young but ulcer mortality in senior citizens has, nonetheless, remained essentially unchanged or even increased (7).

The situation is different in the developing part of the world like in Ethiopia where perforated PUD remains to be one of the top causes of acute abdomen and emergency surgery. Recent publication from Ethiopia put perforated peptic ulcer disease to be 3<sup>rd</sup> most common cause of acute abdomen following appendicitis and intestinal obstruction. More over our patients are younger, males are affected much more than females and the vast majority of perforations are duodenal (8, 9).

Most of the risk factors associated with perforation such as alcohol, smoking are well known but some may be related to local habits such as use of chat, a stimulant leaf widely used in east Africa and Arabian peninsula and known for many gastrointestinal adverse effects (10).

Various techniques of closure (and their modifications) of the perforation were described such as simple closure, closure with vascularized omental pedicle (Cellon-Jones) and free omental plug (Graham's). Putting a sub-hepatic drain after closure is being practiced in some centers like ours although its value is not substantiated (2). The situation of the patient at presentation, delay at presentation and surgical intervention are now well known to be related to outcome of the patient (4). Perforated peptic ulcer is one of the commonest causes of acute abdomen. Despite the improvement in medical practices and technology, perforations of peptic ulcers still pose a challenge to the clinician especially in the third world as between 2-14 % of patients who have peptic ulcer disease develop this complication. As was noted by other colleagues, perforation may be the first clinical presentation of peptic ulcer disease in some patients especially in developing countries(11)



## **1.2. Statement of the problem**

Peptic ulcer disease (PUD) represents a worldwide health problem because of its high morbidity, mortality and economic loss. It affects 4 million people worldwide annually and its lifetime prevalence in patients with PUD is about 5% (12).

Perforated peptic ulcer (PPU) is a serious medical condition with a mortality rate as high as 25%. With the introduction of proton pump inhibitors (PPIs) and increased knowledge of PPU etiology, the incidence of PPU has reportedly decreased in Western countries (13).

Peptic ulcer disease remains a significant health care problem, which can consume considerable financial resources. Despite a sharp reduction in incidence and rates of hospital admission and mortality over the past 30 years, complications are still encountered in 10–20% of these patients (10).

In Africa, despite the introduction of new drugs and recommended guidelines, treatment of peptic ulcer remains a challenge in most African countries, because of the high cost of medications and cultural behaviors. PPU accounted for 4.6 to 29.7% of emergency surgery in Africa with in-hospital mortality rate reaching 11% (14).

Almost 70 percent of deaths from peptic ulcer disease are the result of perforation. Based on data from 11 European studies, there are between 4750 and 17,750 deaths from PPU every year (15). Even though the frequency of perforated peptic ulcer disease is decreasing overall among all ages, it is, however, becoming more frequent among old people and women who acquired their *H. pylori* infection earlier in life, are on regular ulcerogenic drugs such as steroids and anti-inflammatory drugs, or who smoke (16).

The situation is different in the developing part of the world like Ethiopia where perforated PUD remains to be one of the top causes of acute abdomen and emergency surgery.

Recent publication from Ethiopia put perforated peptic ulcer disease to be 3rd most common cause of acute abdomen following appendicitis and intestinal obstruction. Moreover our patients are younger, males are affected much more than females and the vast majority of perforations are duodenal.

Even though perforated peptic ulcer is a serious complication of peptic ulcer disease with potential risk of grave complications which affects peoples at large and remains to be a wider public health concern in our environment, there are still few studies done on perforated peptic ulcer disease in the country and as far as my knowledge is concerned, even there is no such study done at South Gondar, Debre Tabor in particular.

### **1.3. Significance of the study**

This study is conducted at DTCSH with the following significance. Doing this study:

- ❖ Will provide valuable epidemiological information about the proportion and associated factors of perforated peptic ulcer disease in the area. This will in turn help to create better awareness about the proportion and associated factors of this disease among health professionals, which will add improvement in both medical and surgical care management by doing early diagnosis and giving timely intervention to save the patient's life.
- ❖ Will also enforce and enhance health institutions to community education to well aware the people about the proportion and associated factors of the disease among them so as to increase their intention about health and to bring life style change to decrease their risk.
- ❖ Will Create better understanding about the proportion and associated factors of this disease among the people will increase their intention about health and intend them to have early health seeking behavior.

The hospital may also draw a better management plan for the future based on the magnitude of the disease relative to other causes.

Besides this, the study might provide additional input to previous studies, and serve as base line information for further studies in the future.

## **2. LITERATURE REVIEW**

### **2.1. Prevalence of Perforated peptic ulcer diseases**

A hospital-based cross-sectional retrospective study carried out over a period from January 2014 - December 2018 in Cameroon out of the 48 screened cases, 45 cases (93.8%) had gastric ulcer perforations, 22 (48.9%) of which were positive for *H. pylori* infection while 3 cases (6.2%) had duodenal ulcer perforations, 1 (33.3%) of which was positive for *H. pylori* infection.

40/45(88.9%) gastric ulcer perforation cases were pyloric perforations(17).

Retrospective study over a 1-year period (1 January through 31 December 2016), there were 563 Emergency General Surgery patients referred from district hospitals to the University Teaching Hospital of Kigali, Rwanda, the most common diagnoses were bowel obstruction (n=125, 22%), soft tissue infection (n=113, 20%), and trauma (n=104, 18%) The median patient age was 28 years (13-45 years), and most patients (n=377, 67%) were males. Most patients had no co morbidity (n=469, 83%) and no prior surgical history (n=478, 85%). The median duration of symptoms was 4 days (2-7 days)(18).

A prospective study which includes 300 consecutive patients of perforation peritonitis studied in Pakistan the most common cause of perforation peritonitis noticed in this series was acid peptic disease 45%, perforated duodenal ulcer (43.6%) and gastric ulcer 1.3% followed by small bowel tuberculosis (21%) and typhoid (17%), large bowel perforation due to tuberculosis 5%, malignancy 2.6% and volvulus 0.3%, Perforation due to acute appendicitis (5%)(19).

In the prospective study in Mumbai, India, a total of 150 cases of perforation peritonitis were included, which constituted 23% of surgical abdominal emergency admissions. Duodenal perforation (41%) was the most common cause of perforation peritonitis(20).

Study done at University of Benin Teaching Hospital, over one year period between September 2009 and August 2010, acute appendicitis confirmed in 71 patients (82%) was the commonest cause of surgical acute abdomen in the study followed by perforated peptic ulcer and intestinal obstruction 26 and 25% respectively(21).

In a study done at Ayder Comprehensive Specialized Hospital from 2015 -2016, 514 emergency surgical operations of which 439 were laparotomy for non-traumatic acute abdomen and

20(4.1%) were done for perforated PUD. A retrospective cross-sectional study was conducted in Dessie Referral Hospital by revising three years patient card registry data from June 1/2016 - May 30/2019. 77 patients underwent emergency laparotomy for perforated peptic ulcers which accounted for 10.9% (5).

## **2.2. Associated factors of perforated peptic ulcer disease**

Retrospective and prospective Hospital-based study in Ghana, 2009 Korle-Bu Teaching Hospital there were a total of 326 cases, 157 retrospective and 169 prospective. There were 267 males and 59 females; ratio 4.5:1 the mean age (SD, range) of the patients was 40.9 (16.4, 4-87) years. Overall, perforated peptic ulcer accounted for 4.6% of non-traumatic acute abdomen that required surgery. The peak age incidence of perforation was in the 20 – 49 year age group. Co-morbid conditions were present in 48 (18.2%) of cases. Ulcerogenic substance intake was in 177 (67%) patients. One hundred and twenty-two (46.2%) patients reported to hospital within 24 hours of perforation. There were 287 (88%) duodenal, 22 (7.1%) prepyloric, and 19 (4.9%) type 1 gastric ulcer perforations (16).

A Retrospective Analysis in Two Referral Hospitals in Douala, Cameroon 2020 a total of 176 cases of perforations was identified, 48 (41.2%) benefited from a biopsy among which the prevalence of *H. pylori* infection was 47.9%. Their mean age was  $40.0 \pm 16.5$  years and Sex ratio (M: F) was 5:1. Smoking, alcohol consumption and Non-Steroidal Anti-inflammatory Drugs (NSAIDs) use, were not associated with peptic ulcer perforation (17).

119 patients admitted to Al-Ain Hospital in United Arab Emirates with PPU between January 2000 and March 2004 were studied retrospectively; Smoking and history of PUD were the most common factors, 42 patients in each category (36.2%), while NSAID usage was less common, 13 patients (11.2%). Alcohol intake was documented in three patients (2.6%) (2).

All patients who had surgery for acute abdomen with a finding of perforated duodenal or gastric ulcer from 2012 to 2017 were included in the retrospective study carried out over a 5-year period at Niger Delta University Teaching Hospital of perforated peptic ulcer disease. There were 50 patients meeting the inclusion criteria. There were 28 males and 22 females. The 41 to 50 age group was the most affected. The use of Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) and alcohol consumption were seen in 30% and 76% of patients respectively (11).

Steroids by their anti-inflammatory property prevent fibrous tissue formation at the site of ulcer and predisposes for the perforation. Regular use of NSAIDs was found in 30% of patients with perforated ulcers(22).

Prospective study was conducted over a period of 2 years from September 2015 to August 2017 on patients admitted in the Surgical Wards of the 110 patients studied in India 106(96.3%) were males and 41-50 years was the most common age group. Majority (80%) belong to laborious workers commonly associated with alcohol intake and smoking. Pain was the most consistent symptom while guarding (89.1%), tenderness (81.8%) and obliteration of liver dullness (76.4%) were the most important signs present. Gas under the diaphragm was present in 97.3% of patients. Pre-operative shock, old age, longer duration of perforation, concurrent medical illness and higher grade of peritoneal contamination are the main factors affecting the morbidity and mortality in duodenal ulcer perforation. Mortality rate was 6.4% in this study. Simple closure with Graham's omentopexy followed by proton pump inhibitor drugs is an effective treatment procedure for duodenal ulcer perforation. H. pylori eradication after simple closure may be necessary to prevent recurrence of ulcer(6).

A retrospective cross sectional study was conducted in Dessie Referral Hospital by revising three years patient card registry data from June 1/ 2016 - May 30/2019 G.C Of these 96(95%) men and 5(5%) women were enrolled in the study. There was a male preponderance with a ratio of 19.2 to 1. Majority of patients 67 (66.3%) were younger than 50 years with mean age of  $36.05 \pm 16.56$ . Sixty two (61.4%) and 38(37.6%) patients reported previous history of dyspepsia and treatment for peptic ulcer disease, respectively. Nine (8.9%) patients reported history of recent ingestion of alcohol whereas only 3 patients have history of NSAIDs. Seven (6.9%) patients had co-morbidities with hypertension, diabetes mellitus, RVI, cardiac disease, respiratory illnesses(5).

A retrospective analysis of medical records of 76 patients who were operated up on for perforated peptic ulcer over a two year period in Zewditu memorial hospital showed male to female ratio was 6.6:1 with a mean age being 31.5 years. The most common presenting symptom was abdominal pain in 76(100%) patients, 25% gave no history of previous peptic ulcer. Among that 53/64(82.8 had smoking and 48/64(75%) chat chewing. Seventy patients (92.1%) presented after 48 hours of their illnesses, 65(85.5%) patients had duodenal ulcer perforation, and mean hospital stay was 14.5 days(5).

### **2.3. Clinical features of peptic ulcer disease**

In a similar retrospective cross sectional study conducted in Dessie Referral Hospital Duration of illnesses ranged from 1 to 10 days with mean duration of  $2.5 \pm 1.77$  days. Fifty six (55.4%) patients presented before 48 hours of onset of symptom, 45 (44.6%) of patients presented after 48 hours of onset of symptoms. All 101 patients presented with sudden onset of severe abdominal pain(23).

Plain X-ray of abdomen in erect with gas under diaphragm (pneumoperitoneum) was found in 67 (95.71%) and ultrasound suggestive of pyoperitoneum was found in all 70 (100%).

It was found that 57 (81.42%) patients had an anterior duodenal perforation, 12 (17.14%) patients had a gastric perforation with a ratio of 4.7:1, and 1 patient had a combined gastric and duodenal perforation(24).

A new option was tried, that is, the suture was applied a bit away from the edge and a figure-of-8 was made The following advantages were found with this technique:

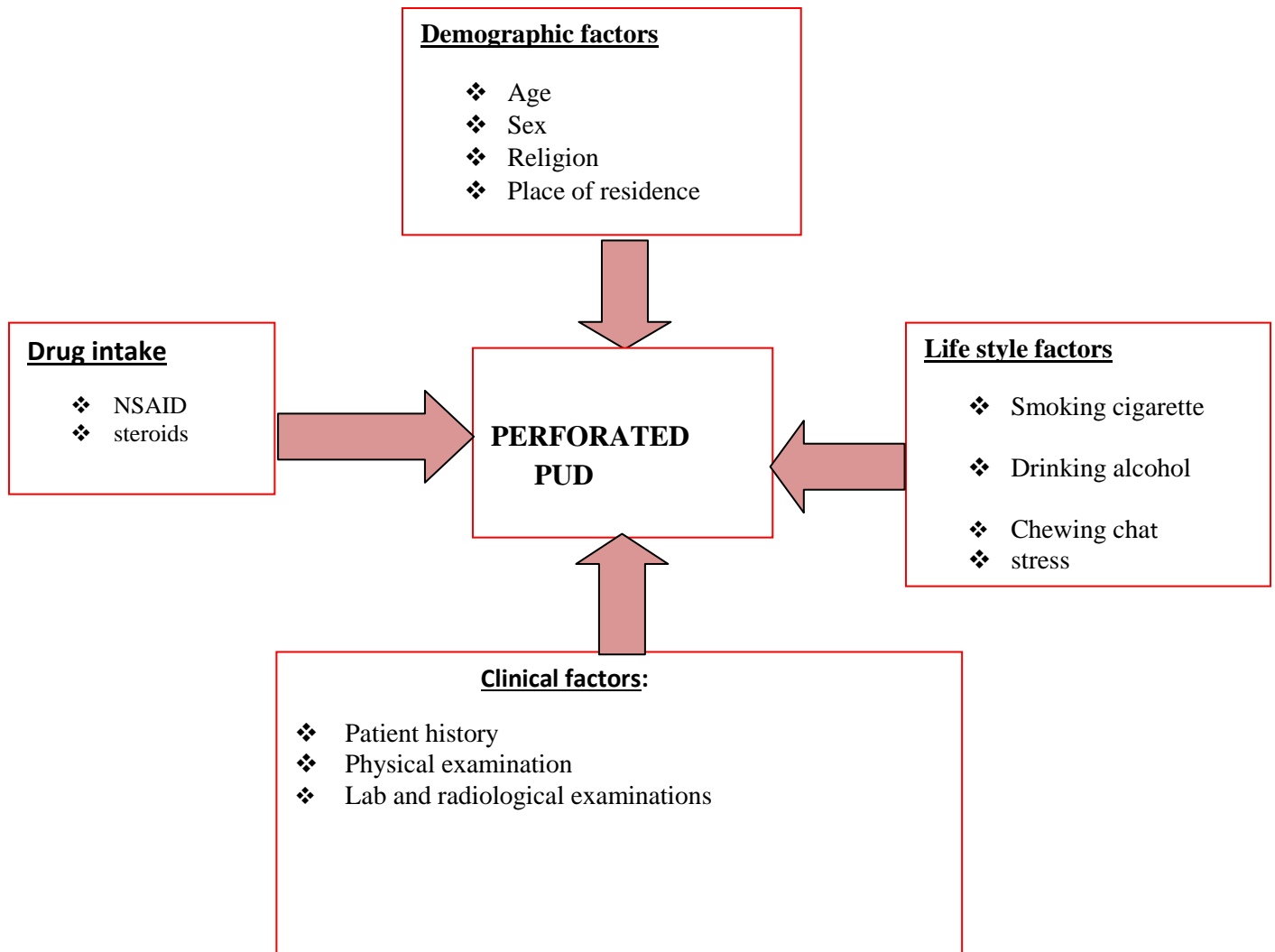
1. The suture can be taken from a relatively longer distance by even a small needle.
2. There is lesser tendency to cut through because the pressure at one point is divided into two directions, and the pressure is exerted on four points instead of two points. When a simple stitch is applied, there are more chances of cut through the friable and edematous walls because pressure is directed towards one point.

3. The edges of the ulcer do not tend to Evert by the effect of the figure-of-8 stitch and approximation of edges has been found to be satisfactory

4. The cross of the figure-of-8 comes over and supports the most friable and edematous central part of the ulcer. A prospective study of figure of eight closure versus graham omental patch” conducted in Department of General Surgery at Government Rajaji Hospital, Madurai from March 2017 to August 2018, a total of 50 patients of perforation peritonitis, Postoperative leak was found only in 1 case out of 34 cases, p value is 0.003, found to be significant.

Postoperative mortality was not found in any case of Figure of Eight repair, whereas 3 out of the 16 cases of omental repair had postoperative mortality. So in cases of patients presenting with perforation peritonitis in more than 6 hours Figure of Eight is superior to conventional omental patch in terms of mortality and postoperative leak(25).

### 3. CONCEPTUAL FRAMEWORK



Source:-constructed by reading different literature.

**Figure 2:** conceptual framework on the proportion and associated factors for perforated peptic ulcer.

## **4. OBJECTIVES**

### **4.1. General objective**

The objective of this study is to assess the proportion and associated factors of perforated peptic ulcer disease among adult patients with non-traumatic acute abdomen who were admitted to surgical ward and operated at Debre Tabor Comprehensive Specialized Hospital from January 2020 to January 2022 G.C.

### **4.2. Specific objectives**

- ❖ To determine the proportion of perforated peptic ulcer disease.
  
- ❖ To identify associated factors for perforated peptic ulcer disease.



## **5. METHODOLOGY**

### **5.1. Study area and period**

The study was conducted at Debre Tabor Comprehensive Specialized hospital from January to July 2022. Debre Tabor Comprehensive Specialized Hospital is found at Debre Tabor Town which is the capital town of South Gondar Zone, Amhara National Regional State. The town is located at north central Ethiopia, which is 98 km away from Bahir Dar, the main city of Amhara regional state and 667 km away from Addis Ababa, the capital city of Ethiopia. The city is found approximately 11°51'N 38°1'E with an elevation of 2,706 meters above sea level. There are three health centers, four health posts, five private clinics and one comprehensive specialized hospital in the town. Debre Tabor General hospital was established on 1968E.C and changed to Debre Tabor comprehensive specialized hospital in 2021G.C. It serves for approximately 3.5 million people in the catchment area. Currently, it has a total of 439 staffs, five major clinical departments, adult and neonatal intensive care units. The hospital has a bed capacity of 163, out of this 31 belongs to the surgical ward. In this ward there are 11 general surgeons, 1 urologist, 2 IESOs, 10 general practitioners, 17 nurses, 6 IESO students and 10 interns giving care for surgical patients with 3 operation tables and 6 recovery beds (DTCSH Head Office).

### **5.2. Study design**

Cross sectional study design was conducted on adult patients with non-traumatic acute abdomen who were admitted to surgical ward and operated. Data were retrieved retrospectively from operation log books, operation notes and patient charts at Debre Tabor Comprehensive Specialized Hospital for the attainment of the study objectives.

### **5.3. Source Population**

All adult patients presented with non-traumatic acute abdomen and admitted to surgical ward at Debre Tabor Comprehensive Specialized Hospital.

## 5.4. Study population

All adult patients with non-traumatic acute abdomen who were admitted to surgical ward and operated for acute abdomen at Debre Tabor Comprehensive Specialized Hospital during the time from January 2020 to January 2022 G.C were study population.

## 5.5. Eligibility criteria

### 5.5.1 Inclusion criteria

All adult patients with non-traumatic acute abdomen who were admitted to surgical ward and operated for non-traumatic acute abdomen at Debre Tabor Comprehensive Specialized Hospital from January 2020 to January 2022 GC were included.

### 5.5.2 Exclusion criteria

All adult Patients with non-traumatic acute abdomen who were admitted and operated at Debre Tabor Comprehensive Specialized Hospital but whose charts were unavailable from the shelf or under police investigation for medico legal reasons during study period were not included. Patient charts having incomplete data were also not included.

## 5.6. Sample size determination and sampling procedure

### 5.6.1. Sample size determination

The sample size was determined using single population proportion formula assuming 95% confidence level and 3% margin of error and using the proportion (p) of peptic ulcer disease among non traumatic acute abdomen which was 10.9% from previous study done in Dessie Referral Hospital in 2016 GC. Therefore  $P = 0.109\%$

Based on power approach sample size calculation formula

$$n = \frac{(Z_{\alpha/2})^2 pq}{d^2}$$

For this study A 95% confidence interval was desired with  $z_{\frac{\alpha}{2}}=1.96$

Precision (absolute): the result desired to be within 3% of the true value  $d = 0.03$ .

Summary:  $z_{\frac{\alpha}{2}} = 1.96$ ,  $p = 0.109$ , and  $d = 0.03$

Where,  $n$  = is the required sample size.

$z$  = is the confidence level

$p$  = is the proportion of peptic ulcer disease from previous study.

$q = 1-p$

$d$  = the margin of error.

$n = 414$ .

By adding 10% non-response rate the final required sample size was 455.

The above sample size was for the first specific objective, but to check whether it is sufficient or not to assess the associated factors for perforated peptic ulcer disease, sample size was calculated for some independent variables using Epi info version 7 (Table 1). Assumptions were taken as confidence level=95%, power=80%, case: control ratio 1:1, odds ratio=2

**Table 1:** Sample size for the 2<sup>nd</sup> objective on proportion and associated factors of perforated PUD among adult patients with non traumatic acute abdomen who were admitted and operated at DTCSH.

Determinant factors	Assumptions (CI=95%, power: 80%) (case: control ratio 1:1, odds ratio=2)	Sample size	10% for card lost	Total
Cigarette smoking	Proportion of exposure among patients with perforated peptic ulcer disease is 57.1% [2].	104	10	114
Duration of illness >24 hrs	Proportion of exposure among patients with perforated peptic ulcer disease is 63.6% [2].	368	37	405
H.pylori infection	Proportion of exposure among patients with perforated peptic ulcer disease is 59.7% [2].	288	29	317

Number of possible cases that could be included in the sample size calculated for the second specific objective using Epi info version 7 statistical program was less than the sample size

calculated for the first specific objective using single population proportion formula. Therefore, the total sample size was 455 adult patients with non-traumatic acute abdomen.

### **5.6.2. Sampling procedure**

All unique medical registration numbers of adult patients with non-traumatic acute abdomen who were admitted to surgical ward and operated at Debre Tabor Comprehensive Specialized Hospital from January 2020 to January 2022 GC were selected from operation log books & sorted based on their unique medical registration number in Microsoft Excel. Then by systematic random sampling technique, patient charts were selected every K ( $k=N/n=860/455=1.89\approx 2$ ). Where:- N=study population, total non traumatic acute abdomen admitted and operated in the past 2 years were 860.

n=sample size.

Then, well trained two degree holder Nurses filled the required data from the selected charts with check list. The chart which were incomplete were replaced by charts having complete data information from the source.

## **5.7. Variables of the study**

### **5.7.1. Dependent variable**

- ❖ Perforated peptic ulcer

### **5.7.2. Independent variables**

- ❖ Age
- ❖ Sex
- ❖ Stress
- ❖ NSAIDs
- ❖ Smoking
- ❖ Alcohol intake
- ❖ Chat Chewing
- ❖ Clinical presentation-duration of illness, sign and symptom
- ❖ Medical history -PUD history, H. pylori and HIV infections
- ❖ Investigations- CBC, HIV, H. pylori test and CXR

## **5.8. Operational definitions**

- ❖ Acute abdomen:- sudden onset of abdominal pain in the abdominal region for more than 6 hrs
- ❖ Adult patient:- non pediatric age patients  $\geq 15$  years
- ❖ Perforated Duodenal Ulcer:- perforation of the first part of the Duodenum
- ❖ Perforated Gastric Ulcer:- perforation of the stomach on the lesser curve of Gastric region.
- ❖ Perforated Peptic Ulcer:- perforation of the stomach in either the Duodenal or the Gastric region. In this study, PPU is identified by evaluating the patient medical records with predetermined operative diagnosis of the disease.
- ❖ Peptic Ulcer Disease: - is defined as mucosal break or erosion with necrotic base in the middle of the lesion. In this study it is identified by the presence of clinical features of the disease in the patient medical record or by reviewing investigation reports.
- ❖ Dyspepsia:- was defined as pain in the epigastric region of the abdomen
- ❖ Abdominal pain:- was defined as troublesome pain in the abdominal region
- ❖ Pain Killers: any member of the group of drugs used to achieve relief from pain.

## **5.9. Data collection instrument and data collection procedure**

After Operatively treated non traumatic acute abdomen cases identified from Operation Register, their medical record number was listed and study participants were selected using systematic random sampling method. By using structured Checklist Data was collected by two trained nurses. 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 in to SPSS version 25 for analysis. Frequencies with percentages used to describe the entire variables of the study assessed. A bivariable binary logistic regression model was used to select the independent variables associated with perforated peptic ulcer disease among surgically treated non traumatic acute abdomen as the binary dependent variable. All factors with a P value  $< 0.25$  in the bivariable binary logistic regression analysis were considered as a candidate to be entered into the multivariable multivariate 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. Hosmer and Lemeshow goodness of fit test model was used.

### **5.11. Data quality assurance**

The data collectors were trained for one day. Before data collection started patient cards and Operation room registration books were cross matched.

### **5.12. Ethical clearance**

Ethical approval and clearance was obtained from Bahir Dar University, school of medicine and health science, Institutional Health Research and ethical review committee. Supporting letter was also written for Debre Tabor Comprehensive specialized hospital and the objective of the study was informed for them and the information collected for this research project were kept confidential and stored in a file, without chart name, but a code number assigned to it which was not revealed to anyone except the principal investigator and his assistants was used.

## 6. RESULTS

During this study, four hundred fifty five (455) cases were studied. Data were categorized based on: demographic variables, pattern of acute abdomen, Clinical variables, medical and behavioral factors. The study revealed that majority of the cases, 75.0% (30/40) were males with a male to female ratio of 3:1. The mean age at presentation was  $31.85 \pm \text{SD of } 12.7$  years.

### A: Demographic variables

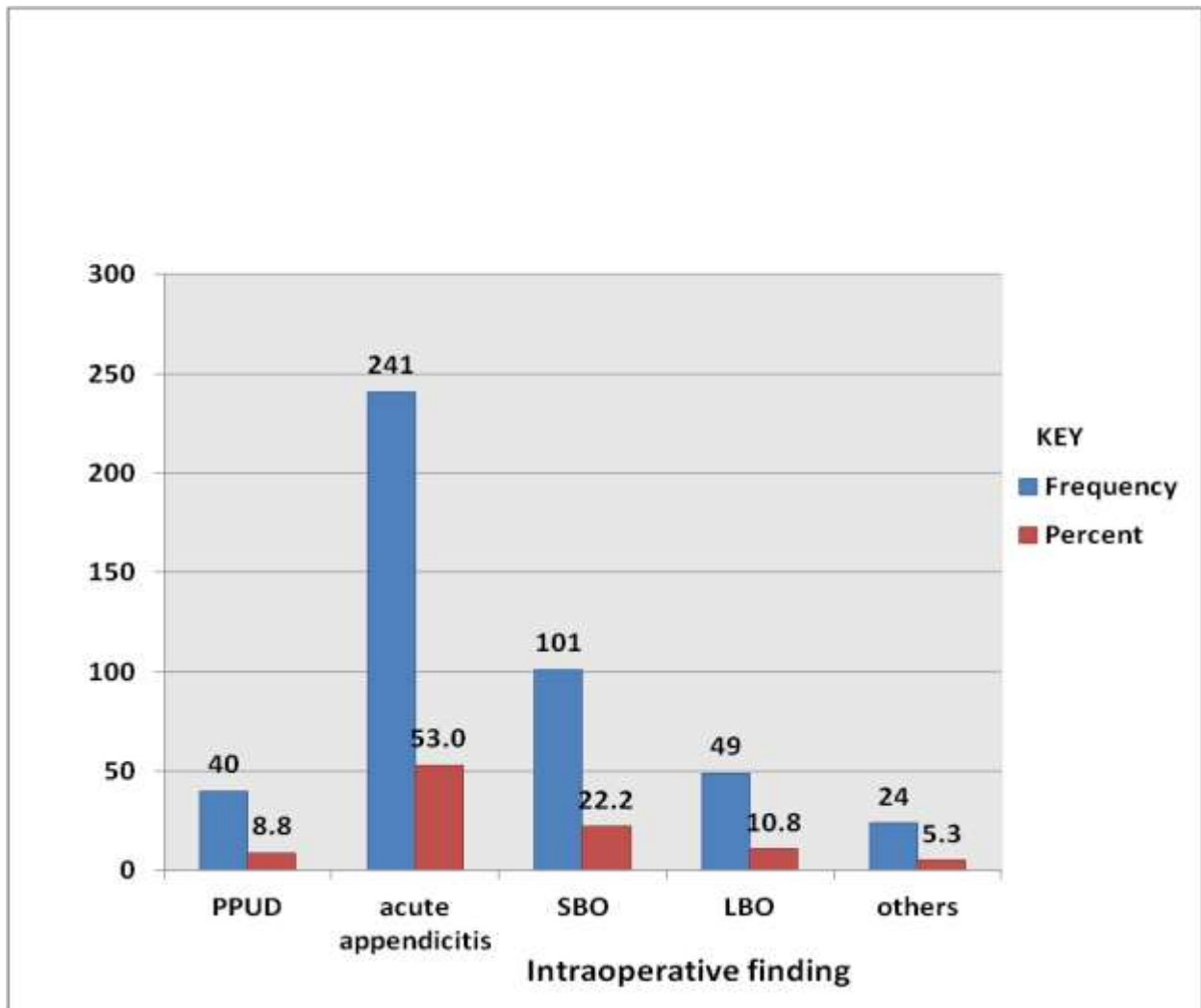
Most patients were in the third decades of life with mean age  $31.85 \pm \text{SD of } 12.7$  years. Thirty (75.0%) of perforated PUD cases were males and ten (25.0%) of Perforated PUD patients were females with male to female ratio of 3:1. 35(87.5%) were Orthodox and 5(12.5%) were Muslims. 28(70%) were from rural and 12(30%) were from Urban.

**Table2:-** Demographic and frequency distribution of perforated PUD cases at Debre Tabor Comprehensive Specialized hospital from January 2020 to January 2022

Variables	Category	Frequency (%)	PUD		
			Yes (%)	No (%)	
Sex	Male	378(83.1)	30(7.9)	348(92.1)	
	Female	77(16.9)	10(13.0)	67(87.0)	
Religion	Muslim	15 (3.3)	5(33.3)	10(66.7)	
	Orthodox	439 (96.5)	35(8.0)	404(92.0)	
	Others	1(0.2)	0(0.0)	1(100.0)	
Residence	Urban	62 (13.6)	12(19.4)	50 (80.6)	
	Rural	393 (86.4)	28 (7.1)	365(92.9)	
Age	Range	Minimum	Maximum	Mean	Std.Deviation
	65	15	80	31.85	12.7

### B: Pattern of acute abdomen

All patients (455) in this study underwent emergency operation for acute abdomen between January/2020 to January /2022. Of these, 241 operations were for acute appendicitis, 101 operations were for small bowel obstruction, 49 operations were for large bowel obstruction, 40 for perforated peptic ulcer disease and 24 operations were done for other diseases like (intussusception, iliosigmoid knotting, TB peritonitis) accounting 53.0 %, 22.2 %, 10.8% , 8.8 % and 5.3% of emergency surgery respectively. All perforations were located on the first part of duodenum in 100% of the cases. Graham’s patch, peritoneal lavage with warm saline and mass closure of the abdomen was performed.



**Figure 3:-** Distribution of operated acute abdomen at Debre Tabor Comprehensive Specialized hospital from January 2020- January 2022 GC.



### C: Clinical variables, medical and behavioral factors

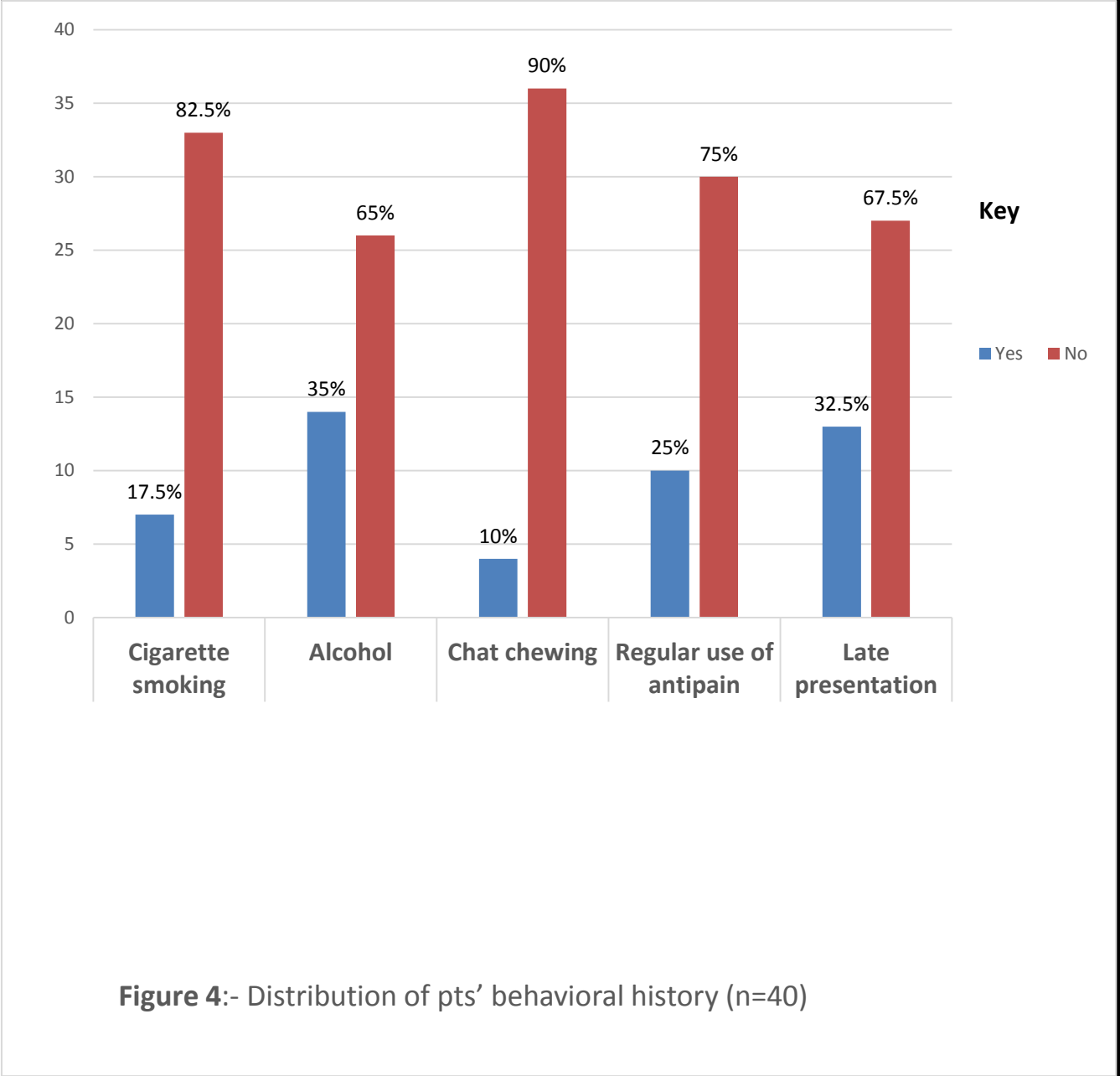
All perforated PUD cases were presented with abdominal pain, Epigastric pain in 97.5% (39/40) of the cases, dyspepsia in 35 % (14/40), bloody vomiting in 20% (8/40) of the cases. Late presentation in 32.5 % (13/40) of the cases after 24 hrs of their illness and the rest 67.5 % (27/40) of the cases presented before 24hrs of their illness. Thirty seven (92.5 %) of the cases had no previous history of PUD. Four (10.0%) of the cases had history of H. pylori infection. 97.5 % ( 39/40) of PPUD cases documented to have free gas under the right diaphragm.

**Table 3:** Distribution of the patients' clinical presentation and medical history

Variable	category	PPUD (n=40)	
		Frequency	Percent
History of PUD	Yes	3	7.5
	No	37	92.5
Abdominal pain	Yes	40	100.0
	No	0	0.0
Epigastric pain	Yes	39	97.5
	No	1	2.5
History of H.pylori infection	Yes	4	10.0
	No	36	90.0
Dyspepsia	Yes	14	35.0
	No	26	65.0
Bloody vomiting	Yes	8	20.0
	No	32	80.0

**Table 4 :** Distribution of the patients' behavioral History: regular use of NSAID, cigarette smoking, chat chewing , alcohol intake and late presentation (n= 40)

Variable	category	PPUD (n=40)	
		Frequency	Percent
Cigarette smoking	Yes	7	17.5
	No	33	82.5
Chat chewing	Yes	4	10.0
	No	36	90.0
Regular use of Anti-pain	Yes	10	25.0
	No	30	75.0
Late presentation	Yes	13	32.5
	No	27	67.5
Alcohol	Yes	14	35
	No	26	65



### **D: Factors associated with perforated peptic ulcer disease**

From the bivariable binary logistic regression analysis, factors including sex, religion, residence, smoking, drinking alcohol, chat chewing, history of Dyspepsia, H.pylori infection and duration of illness were associated with perforated peptic ulcer disease (at  $P < 0.25$ ).

Subsequently, all these factors were entered into the multivariable multivariate logistic regression model. In the multivariable analysis, Factors significantly associated with perforated peptic ulcer disease (at  $P < 0.05$ ) were being male, drinking alcohol, history of dyspepsia and late presentation at admission, while all other factors entered became insignificant.

Females were 76.9% less likely to be affected by PPUD compared to males (AOR=0.231; 95%CI: 0.072-0.737;  $p < 0.013$ )

Patients with history of drinking alcohol were about twenty five times (AOR=25.149; 95%CI:4.604-37.386;  $P < 0.001$ ) more likely had risk of perforated PUD than those who didn't drink.

Patients who had history of dyspepsia were about twenty one times (AOR=21.754; 95%CI:12.442-28.959  $P < 0.001$ ) more likely had risk of perforated PUD than those who didn't have history of dyspepsia.

Patients who presented late after 24 hours of their illness were about twenty eight times (AOR=28.368; 95%CI:9.472-84.962;  $P < 0.001$ ) more likely had risk of perforated PUD than who presented early with in 24 hours of their illness.

**Table5:** Predictors of perforation according to bi-variate and multivariate logistic regression analysis made on factors affecting the prevalence of perforated peptic ulcer disease at Debre Tabor Comprehensive Specialized hospital. (n=40)

Independent variables	Category	Perforated PUD		Bi-variable analysis	Multivariable analysis
		CASE (%)	NON-CASE (%)	COR (95% C.I.) p-value	AOR ( 95% C.I.) p-value
Sex	Male	30(75.0)	348(83.9)	1	1
	Female	10(25.0)	67(16.1)	1.731(0.808-3.709)0.158	0.231(0.072-0.737)0.013**
	Total	40(100.0)	415(100.0)		
Hx of PUD	Yes	3(7.5)	3(0.7)	0.090(0.018-0.461)0.004	3.922(1.736-8.861)0.08
	No	37(92.5)	412(99.3)	1	1
	Total	40(100.0)	415(100.0)		
Residence	Urban	12(30.0)	50(12.0)	0.320(0.153-0.669)0.002	1.796(0.553-5.830)0.330
	Rural	28(70.0)	365(88.0)	1	1
	Total	40(100.0)	415(100.0)		
Alcohol	Yes	14(35.0)	5(1.2)	0.023(0.008-0.068)0.000	25.149(4.604-37.386)0.001**
	No	26(65.0)	410(98.8)	1	1
	Total	40(100.0)	415(100.0)		
History of Dyspepsia	Yes	14(35.0)	7(1.7)	0.032(0.012-0.086)0.000	21.754(12.442-28.959)0.000**
	No	26(65.0)	408(98.3)	1	1
	Total	40(100.0)	415(100.0)		
Late presentation	<24 hours	27(67.5)	22(5.3)	1	1
	>24 hours	13(32.5)	393(94.7)	0.027(0.012-0.059)0.000	28.368(9.472-84.962)0.000**
	Total	40(100.0)	415(100.0)		

## 7. DISCUSSION

In the present study, on multivariable multivariate logistic regression analysis being male, alcohol, history of dyspepsia and late presentation at admission were the only independent factors associated with perforated peptic ulcer disease. The peak age incidence of perforation was  $31.85 \pm$  SD of 12.7 years.

Among (455) patients underwent emergency operation for acute abdomen between January/2020 to January /2022, 241 operations were for acute appendicitis, 101 operations were for small bowel obstruction, 49 and 40 operations were for large bowel obstruction and perforated peptic ulcer disease accounting 53.0 %, 22.2 % and 10.8% and 8.8 % of emergency surgery respectively. This is different from a study done in Pakistan in which most common cause of perforation peritonitis noticed was acid peptic disease 45%, perforated duodenal ulcer (43.6%) and gastric ulcer 1.3% followed by small bowel tuberculosis (21%) and typhoid (17%), large bowel perforation due to tuberculosis 5%, malignancy 2.6% and volvulus 0.3%, Perforation due to acute appendicitis (5%)(19).

Study in Mumbai, India, also showed Duodenal perforation (41%) was the most common cause of perforation peritonitis(20).

Study done at University of Benin Teaching Hospital, acute appendicitis was the commonest cause of surgical acute abdomen in the study followed by perforated peptic ulcer and intestinal obstruction accounting 82%, 26% and 25% respectively(21).

In a study done at Ayder Comprehensive Specialized Hospital 4.1% of emergency laparotomy among non traumatic acute abdomen were done for perforated PUD. A study conducted in Dessie Referral Hospital 10.9% patients underwent emergency laparotomy for perforated peptic ulcers(5).

This variation in prevalence of perforated PUD among non traumatic surgical acute abdomen is due to its variation in different geographical areas and cultural differences.

Similar in Nigeria and Iraq, study done in Tanzania showed alcohol drinkers were at least three times at increased risk of perforation as compared to non alcohol drinkers. Alcohol is known to impair wound healing through a variety of mechanisms: nutritional deficiencies leading to

impaired wound healing and disinhibition caused by alcohol leads to increased risk behavior hence more predisposition to gastroduodenal ulcer perforation than in abstainers. Chronic alcohol disturbs gastric mucosal barrier by inhibiting COX 1 receptor enzymes which reduce the production of cytoprotective prostaglandin.

The patients' characteristics is contrary to what is reported in developed countries where the majority of the patients are above 60 years with female predominance. Majority of these elderly females in western countries are on anti-ulcer drugs(3). The male predominance in this study may be attributed to greater hardship and alcoholism which is consistent with several reports from Africa which confirm a male predominance in Tanzania, Ghana and Cameroon.

Al-Ain Hospital in United Arab Emirates with PPU between January 2000 and March 2004 was studied retrospectively; Smoking and history of PUD were the most common factors, 42 patients in each category (36.2%), while NSAID usage was less common, 13 patients (11.2%). Alcohol intake was documented in three patients (2.6%)(21). Niger Delta University Teaching Hospital of perforated peptic ulcer disease. There were 50 patients meeting the inclusion criteria. There were 28 males and 22 females. The 41 to 50 age group was the most affected. The use of Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) and alcohol consumption were seen in 30% and 76% of patients respectively(9).

In Dessie Referral hospital Sixty two (61.4%) and 38(37.6%) patients reported previous history of dyspepsia and treatment for peptic ulcer disease, respectively. Nine (8.9%) patients reported history of recent ingestion of alcohol whereas only 3 patients have history of NSAIDS.

In Zewditu memorial hospital 25% gave no history of previous peptic ulcer. Among that 53/64(82.8%) had smoking and 48/64(75%) had history of chat chewing. Seventy patients (92.1%) presented after 48 hours of their illnesses.

## **8. CONCLUSION**

The proportion of perforated PUD was 8.8% out of adult non-traumatic acute abdominal cases in Debre Tabor Comprehensive Specialized Hospital.

Health care facility, Debre Tabor Comprehensive Specialized Hospital is one of the specialized hospitals in Amhara Region, however, the socioeconomic conditions, and educational levels of the cases with the disease were not found and dealt due to incomplete data.

In addition, patients who are dyspeptic, having history of drinking alcohol, those who are late presenters and males were affected significantly.



## 9. RECOMMENDATION

### **Health professionals**

- ❖ Early diagnosis of the cases with acute abdomen should be emphasized by all health care providers at primary level and immediate referral to avoid delay before treatment to reduce morbidity and mortality of perforated peptic ulcer disease.
- ❖ Awareness about the proportion of the disease, its main associated factors and available treatment options must develop through various approaches of mass communication and education done by the hospital.

### **Zone Health Department**

- ❖ Provision of H. Pylori test should be enforced along with the proper establishment of the health system in the health care facilities.

### **For the Hospital**

- ❖ The hospital should announce through mass media and health education for the people that the prevalence of PUD and its complication among them becoming increasing.

## **10.LIMITATION OF THE STUDY**

The study was hospital-based study encompassing a single hospital. Even though this hospital is the largest governmental hospital for the treatment of peptic ulcer, other hospitals also account for similar cases of patients. Therefore, the results from this study may not show a complete diversification of peptic ulcer.

Since a secondary data there was difficulty in obtaining data of client's educational levels, occupations and socioeconomic conditions for description and analysis.

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## 12. ANNEXES

Date.....

Serial No.....

### Annexes I:-Data extraction check list:

This data extraction check list is prepared to collect data from the documents to assess the proportion and associated factors of perforated peptic ulcer disease at Debre Tabor Comprehensive Specialized hospital during the years 2020-2022 GC. Data will be collected from operation log books, operation notes, anaesthesia registers and patients charts by well trained Data collectors.

Date ----- MRN ----- Data collector..... Code.....

<b>Part1. Questions on patient identification:</b>				
101	Age (in years):	Alternative response	skip	code
	>=15years: code(1)	.....		
102	Sex			
	Male: code (1)			
	Female: code (2)			
103	Religion			
	Muslim: code (1)			
	Christian: code (2)			
	others: code (3)			
104	Residence			
	urban: code (1)			
	Rural: code(2)			

<b>Part 2. Questions on life style factors:</b>				
201.	History of cigarette smoking?	Alternative response	skip	code
	Yes :code (1)			
	No: code (2)			
202.	History of drinking alcohol?			
	Yes :code (1)			
	No :code (2)			
203	History of chewing chat?			
	Yes :code (1)			
	No :code (2)			
<b>Part 3. Questions on drug intake factors:</b>				
301	History of using regular anti pain?			
	Yes: code (1) if yes, specify	----		
	No: code (2)			
302	If yes for Q301, for what?			
	Rheumatoid arthritis: code (1)			
	Others: code (2)			
303	What was the Drug?			
	ASA: code (1)			
	Paracetamol code (2)			
	Ibuprofen: code (3)			
	Prednisone: code (4)			
	Others: code (5)			

<b>Part4. Questions on clinical factors</b>				
<b>A:(Questions on patient history):</b>				
401	Previous history of PUD?	Alternative response	skip	code
	Yes: code (1)			
	No :code (2)			
402	History of HIV infection?			
	Yes: code (1) if yes	CD4 :		
	No :code (2)			
	Not specified: code (3)			
403	History of triple therapy for H.pylori?			
	Yes: code (1)			
	No :code (2)			

404.	History of abdominal pain?			
	Yes: code (1)			
	No :code (2)			
405.	History of epigastric pain?			
	Yes: code (1)			
	No :code (2)			
406.	History of Dyspepsia?			
	Yes :code (1)			
	No: code (2)			
407.	History of bloody vomiting?			
	Yes :code (1) No: code (2)			
408.	History of coffee ground stool?	Alternative response	skip	code
	Yes :code (1)			
	No: code (2)			
409	History of failure to pass flatus?			
	Yes :code (1)			
	No: code (2)			
410	History of failure to pass Faeces			
	yes :code (1)			
	No :code (2)			
411	History of abdominal distension?			
	Yes :code (1)			
	No: code (2)			
412.	Duration of symptoms?			
	< 24 hours: code (1)			
	24-48 hours: code (2)			
	> 48 hours: code (3)			
413.	History of previous operation?			

	Yes: code (1)			
	No :code (2)			
414.	For what was the operation done?			
	PPU: code (1)			
	Appendicitis: code (2)			
	Bowel obstruction :code (3)			
	others specify :code (4)			
<b>B:Questions on physical examination:</b>				



415	Abdominal tenderness	Alternative response	skip	Code
	yes: code (1)			
	no :code (2)			
C:Questions on laboratory and radiographic examinations				
416	WBC count/mm <sup>3</sup> normal?			
	Yes:code(1)			
	No:code(2)			
If no for above	< 4:code(1)			
	4- 11:code(2)			
	>11:code (3)			
417	Pre operative Hematocrit normal?			
	Yes :code (1)			
	No: code (2)			
If no for above	< 22.5 %-code (1)			
	22.5-34.5 %-code (2)			
	> 34.5 %-code(3)			
418	H. pylori test result?			
	Reactive: code (1)			
	Non reactive: Code (2)			
	Not specified: code(3)			

419	HIV test result	Alternative response	skip	Code
	Reactive: code (1) If 1, specify CD4?	CD4:		
	Non reactive : code(2)			
	Not specified: code(3)			
420.	X-ray diagnosis show air under diaphragm?			
	Yes:code(1)			
	No:code(2)			
If no for above	Distended bowel loop with multiple air fluid label: code (1)			
	Distended bowel loop with single air fluid label : code (2)			
	No gas under the Diaphragm :code(3)			
	Not done:code(3)			
421.	Confirmed Diagnosis before operation?			
	PPU with peritonitis :code (1)			
	Small bowel obstruction: code (2)			
	Large bowel obstruction: code (3)			
	Acute appendicitis: code (4)			

422	What was intra operative finding?	Alternative response	Skip	code
	Perforated peptic ulcer: code (1)			
	Perforated ileitis: code (2)	PDU....PGU.....		
	Gangrenous bowel obstruction(3)	SBO-----LBO-----		
	Simple bowel obstruction: code(4)	SBO-----LBO-----		
	Perforated Appendicitis : code (5)			
423	What procedure was done?			
	Graham' s patch and perforation repair:code (1)			
	Derotation &decompression :code (2)			
	Appendectomy: code (3)			
	Resection & anastomosis: code (4)			
	Resection and colostomy: code (5)			
	Resection and ileostomy:code (6)			
430	How long did patient stays in Hospital?	Total ----- days :		
		<7 days:code(1)		
		8-14 days:code(2)		
		>15 days:code(3)		

## Annexes II:-Standard procedures

**Bowel anastomosis:** the type of suturing the proximal part with distal ends of the bowel by end to end, end to side, or side to side type after resecting the diseased segment based on the pathology.

**Bowel decompression:** the type of procedures to empty or to relieve the distended intestine by either inserting nasogastric tube or rectal tube. It can also be done intraoperatively by milking the intestinal content either retrograde towards the stomach and sucking it out by NG tube or antigrade towards the Large intestine to push it out through the rectal tube.

**Bowel derotation:** a procedure in which intestine is derotated or detwisted in its own mesenteric axis back into its normal position as in case of small bowel volvulus (SBV) or sigmoid volvulus after confirming that the bowel is viable after laparotomy.

**Bowel resection:** a procedure in which parts of intestine which is considered to be non viable is cut and removed surgically.

**Colostomy:** The opening of a portion of the large intestine through the abdominal wall to the skin surface for the purpose of stool diversion.

**Graham's patch:** a procedure made to close the Duodenal perforation by holding sufficient tissue with the sutures to allow the edges to be approximated and placing omental patch over the perforation in the hope of enhancing leak sealing.

**Hartmann's procedures:** refers to resection of colon without anastomosis in which a colostomy or ileostomy is created and the distal colon is left as a blind pouch in the pelvis.

**Ileostomy:** is a surgical opening in the abdominal wall, through which a segment of ileum is exteriorized through anterior abdominal wall.

**Laparotomy:** making surgical opening of the abdomen commonly by mid line or transverse incision and entering in to peritoneal cavity for the purpose of exploration.

## Annex III:-Information sheet for hospital administration

My name is Dagninet Alemu Genet; I am a third year intern IESO student, studying my master's Degree at Bahir Dar University with Integrated Emergency Surgery & Obstetrics. I want to

collect data for the study that will be conducted in Debre Tabor Comprehensive Specialized Hospital.

**Title:** Proportion and associated factors for perforated peptic ulcer disease among adult non traumatic acute abdominal admissions at the department of Surgery in Debre Tabor Comprehensive Specialized Hospital.

**Purpose of the study:** The findings of this study will have a paramount importance for the hospital to plan intervention programs to manage patients with peptic ulcer perforation and to improve & strengthen basic emergency surgical services and to decrease mortality in general.

Moreover, the aim of this study is to write a thesis as a partial requirement for the fulfilment of a Master's Degree in Integrated Emergency Surgery and obstetrics for the principal investigator.

**Procedure and duration:** I will collect data from operation log book, patient cards and charts using data extraction format to provide me with pertinent data that is helpful for the study. The data collection will take about 30 days, so I kindly request you to have cooperation with the hospital staff during data collection period.

**Risk and benefits:** no risk on your hospital in being selected in this study but only taking few hours for card room workers for collecting patients' charts. The finding of this study will help the South Gondar Zone Health Office and Debre Tabor Comprehensive Specialized Hospital to design and develop logically appropriate plans and implementation strategies. It is hoped that data obtained from this study will be used to improve on the quality of health care given to the patients.

**Confidentiality:** The information collected from patient chart will be kept confidential. There will be no information that will identify patients in particular, so, each patient information will have a code. The findings of the study will be general for the study population and will not reflect anything particular of individual person or patient. The data extraction format will be coded to exclude showing names.

**Rights:** This study will be done if you are voluntary on the behalf of the hospital. You have the right to allow or not to allow this study in your hospital. You have the right to stop this study if you observe any misconduct during data collection

**Contact address:** If there are any questions or enquires any time about the study or the procedures, please contact me: Dagninet Alemu Mobile: 0923043338

