Assessment of the management of dyspepsia in health centers of Addis Ababa city administration, Ethiopia

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Memorial

To my mother Emahoy Tsedale Beyene

Addis Ababa University

School of Graduate Studies

This is to certify that the thesis prepared by Mintesnot Mustefa Beyan, entitled "Assessment of the management of dyspepsia in health centers of Addis Ababa city administration, Ethiopia" and submitted in partial fulfillment for the requirements of the degree of Master of Pharmacy in Pharmacy Practice to the College of Health Science, Addis Ababa University, complies with the regulation of the university and meets the accepted standards with respect to originality and quality.

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Abstract

Assessment of the management of dyspepsia in health centers of Addis Ababa city administration, Ethiopia

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Addis Ababa University, 2019

Despite the progress made in reducing morbidity, dyspepsia is one of the most common GI diseases, resulting in impaired quality of life and work loss. The purpose of this study was to assess the management of dyspepsia in health centers of Addis Ababa city administration. A cross sectional study was conducted from September 1, 2016 to January 30, 2017 by using previously tested data extraction tool for extract relevant information, which then entered to Epi data and SPSS 20 was used for data analysis. A logistic regression was employed to examine the association between variables. A total of 850 patient with dyspepsia were enrolled, from those study participant 29% had got inappropriate managements. Of all dyspepsia patient who attend health centers 34.2% and 65.8 % were received one drug prescription and triple drug prescription respectively. Regarding appropriate management based on the cause of dyspepsia, patients with NSAIDS are less likely to have appropriate dyspepsia management (AOR= .718(.441, 1.168); P=0.001) than H. Pylori (AOR= 1; P= 0.001) and Stress cause dyspepsia (AOR= 1.642(.893, 3.021). Patients' age group from 16 to 30 account 46.4%, which is a higher prevalence of dyspepsia compare to other age group in the study, also women 58.1% have a higher prevalence of dyspepsia. Based on the finding of this study, it can be concluded that health professionals are mostly follow the guidelines but not always with respect to the use of single and triple treatment in management of dyspepsia which depend on the cause. Proton pump inhibitors drugs have high prescription rate than histamine 2 antagonist and antacid regardless to the cause. Almost half of patients with dyspepsia use NSAIDS. Patient who need additional antibiotic that was not received were higher than patient who received antibiotic that was not needed so it is important that intervention is needed to educate clinicians about the danger of irrational drugs use and to promote the recommended guide lines in the management of dyspepsia.

Key words: Dyspepsia; single therapy; triple therapy; NSAIDS use

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List of acronyms

ADR	Adverse reaction
DDI	Drug-drug interaction
FMHACA	Food medicine health administration control authority
FMOH	Federal minister of health
FD	Functional dyspepsia
H2R	Histamine 2 Receptor
HC	Health Center
NGO	Non-Governmental organization
OPD	outpatient department
PPI	Proton pump inhibitor
PUD	Peptic ulcer disease
SE	Side effect
STG	Standard treatment guide line
WHO	World health organization

1. Introduction

1.1. Background

Dyspepsia is derived from the Greek words and literally means “difficult digestion.” Dyspepsia can *dys* and *pepse* occur due to organic causes, but the majority of patients suffer from functional dyspepsia (FD). It is broadly defined as pain or discomfort centered in the upper abdomen with symptoms such as epigastric pain, postprandial fullness, early satiety, anorexia, belching, nausea and vomiting, upper abdominal bloating, and even heartburn and regurgitation. People with functional dyspepsia have a significantly reduced quality of life when compared to the general population (R. Christopher Harmon et al. 2010; Arvind Kumar et al. 2018).

Dyspepsia is a common presenting symptom complex in primary care all over the world, accounting for 3 - 4% of primary healthcare visits. Population based surveys in many countries have revealed a highly variable prevalence, from 1.8% to 57%, with a global average of 20.8% (R Bitwayiki et al. 2015)

Functional dyspepsia is a multifactorial disease that can be caused by various factors such as gastric motility abnormality and visceral hypersensitivity, infection, and genetics; however, psychosocial factors are also known to be major causes (Younghyeon Nam et al. 2018).

Over 90% of peptic ulcers are caused by infection with the bacterium H. pylori or by use of non-steroidal anti-inflammatory drugs (NSAIDs) (Bertram et al. 2009; Subhas et al. 2010). H. pylori is a spiral-shaped bacterium that is found in the gastric mucous layer or adherent to the epithelial lining of the stomach. According to (Nunoet al., 2015) approximately 50% of the world population is infected by H. Pylori. Infected persons have a 2- to 6-fold increased risk of developing gastric cancer and mucosal- associated-lymphoid-type (MALT) lymphoma compared with their uninfected counterparts. H. pylori causes more than 90% of duodenal ulcers and up to 80% of gastric ulcers. However, the role of H. pylori in non-ulcer dyspepsia remains unclear. (CDC, 1998)

The discovery of H. pylori and its causal role in dyspepsia is one of medical advances of the 20th century. It has caused a paradigm shift in the treatment of dyspepsia. One review have suggested that the early relapse rate can reduced to less than 5% after successful H. pylori eradication (Alexander et al. 2004; P Malfertheiner et al. 2007).

Treatment of dyspepsia will depend on its cause because NSAID-induced dyspepsia in the absence or presence of H. pylori affect the treatment decision, If NSAIDs are the only cause, prescribing of medications that reduce stomach acid are enough to relieve pain, promote healing and help to fight the H. pylori infection. But if H. pylori present in a NSAID, additional to PPIs or histamine receptor blockers, other medications like antibiotics, are needed (Sheila et al. 2014).

In triple therapy the patient takes the antibiotic clarithromycin, a PPI, and either metronidazole or amoxicillin for 7 to 14 days. But in- Quadruple therapy, the patient takes a PPI, bismuth subsalicylate, and the antibiotics tetracycline and metronidazole for 14 days (Ying et al. 2011.) The use of quadruple therapy is recommended - if the patient cannot take amoxicillin because of a penicillin allergy, has undergone treatment before with a macrolide antibiotic, - and is still infected with H. pylori because triple therapy failed to kill the bacteria. The other approach of treatment is sequential therapy in which the patient takes a PPI and amoxicillin for 5 days, followed by a PPI, clarithromycin, and Metronidazole for another 5 days (Jyh et al. 2014.)

Even though there is no specific guideline in Ethiopia for the management of dyspepsia. According to the standard treatment guideline for health centers, the management of dyspepsia associated with H. Pylori included, Amoxicillin 1g, P.O. BID, Clarithromycin 500mg P.O. BID and Omeprazole, 20mg P.O. BID (OR 40mg QD), all for 7 - 14 days as first line. As an alternative treatment Amoxicillin, 1g, P.O. BID, Metronidazole, 500mg, P.O. BID, and Omeprazole, 20mg P.O. BID OR 40mg QD all for 7 - 14 days is recommended (EFMHACA, 2014).

Acid suppression is a possible treatment for functional dyspepsia (indigestion), which is recurring pain over the stomach, bloating, burping or the feeling of being full. Several medicines are used to treat functional dyspepsia; proton pump inhibitors (PPIs) and H2 receptor antagonists (H2RAs) reduce stomach acid, and prokinetics accelerate stomach emptying. There is no clear evidence that one medicine is more effective than another. Although these are considered safe, a few people have side effects. The most common side effects are headache, tummy (abdominal) pain, bloating, diarrhea and feeling sick (nausea). Long-term use of PPIs has been associated with infectious diarrhea (inflammation of the stomach and small intestine), bone fracture and bacterial overgrowth. Therefore, we need to know whether these medications are effective and safe for people with indigestion (Maria Ines Pinto-Sanchez et al. 2017).

1.2. Statement of the problem

Dyspepsia is defined as chronic or recurrent pain or discomfort centered in the upper abdomen. It is established that dyspepsia is a common problem worldwide. In the United States, the point prevalence is approximately 25% and approximately 40% of patients with functional dyspepsia have delayed gastric emptying (Nicholas J. Talley et al. 2005), global prevalence varies between 3% and 40%, symptom account 10% of hospital admissions in Ethiopia (Ayele et al. 2017).

Dyspepsia is a common disorder that can present many clinical dilemmas in patient management. Although not life-threatening, the symptoms are long-lasting, interfere with daily activities and have a significant impact upon quality of life (F Khademolhosseini et al. 2010).

Regardless of its definition, the causes of dyspepsia are known to include peptic ulcer disease, gastro-esophageal reflux, and functional dyspepsia (Sanjiv Mahadeva et al. 2006). The lifetime risk for developing a peptic ulcer is approximately 10%. It resulted in 301,000 deaths in 2013 down from 327,000 deaths in 1990. Prevalence of H. pylori infection is higher in third world countries where it is estimated at about 70% of the population (James K.Y.Hooi et al 2017). In Ethiopia The overall pooled prevalence of H.pylori infection was 52.2% (Melese et al. 2019)

Globally, different strains of H. pylori appear to be associated with differences in virulence, and the resulting interplay with host factors and environmental factors leads to subsequent differences in the expression of disease. Age, ethnicity, gender, geography and socioeconomic status are all factors that influence the incidence and prevalence of H. Pylori infection. According to WHO (2010), the prevalence of H. pylori infection in Ethiopia is higher as age increase – with = 48% at age 2-4, 80% at age 6 and 95% in adult age groups (WHO 2010).

H. pylori and NSAIDs act independently to increase ulcer risk and ulcer-related bleeding and appear to have additive effects. NSAIDs including both prescription and nonprescription medications, are widely used in individuals to treat pain and inflammation. The incidence of dyspepsia is higher in *H. pylori*–positive NSAID users. Whether *H. pylori* infection is actually a risk factor for NSAID ulcers remains controversial (S Rosenstock 2003).

Although clinical guidelines recommend a 10- or 14-day treatment course, some clinicians favor an initial 7-day *H. pylori* regimen. Clinical guidelines recommend PPI+ bactericidal+ bacteriostatic regimen but some clinicians use different regimen. Although literature recommend-using Sequential treatment (Jun et al. 2012). Moreover, to increase patient compliance in sequential therapy -patient counseling is a key.

Some health care provider's diagnosis dyspepsia associated with H. Pylori by using antibody test even if the test is not accurate to diagnose actual infection of H. Pylori. This diagnosis method is usually practiced because it's the cheapest method, since most patients that came in the healthy center are have low economic status, the health care provider use this diagnostic method. In addition, - other methods may not be available on that facility. Treating the patient by using result gain by this method may enforce an appropriate usage of antibiotic and hence results in resistance and unwanted cost that affecting economy.

These research was held to address problem in the quality of dyspepsia management and diagnosing method, the investigated problem give input to formulate solution and option to tackle inappropriate management, with the collaboration of concerned authority to formulate training and also train the health care provider to improve their management stratagem which benefit patient treatment outcome.

Despite the fact that 45% of the population in developing countries live with dyspepsia from that Functional dyspepsia is the most prevalent diagnosis, making up 70% of dyspepsia cases (Amarender S Puri et al. 2012). There is only a countable limited research done on the management of dyspepsia in Ethiopia. Even if there is high prevalence and rate of recurrence limited number of data show how it managed in Addis Ababa health center, also which treatment regimen have used and rate of NSAIDs user in dyspepsia patient. To limit prevalence of unnecessary treatment it's mandatory to show the gap which help to improve management by addressing the problem found to the concerning body.

This assessment answer the questions -How dyspepsia management practice is done in Addis Ababa Health center, the percent of NSAIDs user in dyspepsia patient and which regiment is likely to have high prescription rate.

1.3. Literature review

Assessment on the management of dyspepsia is a descriptive cross sectional retrospective study which done in Addis Ababa health center to give information about how dyspepsia was manage, which management regiment has high prescribing rate and number of patient which use NSAIDs.

Dyspepsia refers to group of commonly occurring upper gastrointestinal symptoms. The majority of patients with dyspepsia suffer from functional (non ulcer) dyspepsia (Hyuk Lee et al. 2014). A condition defined as recurrent or persistent pain or discomfort centered in the upper abdomen, affects 25%–40% of adults in the general population of the United States, incurring over $12 billion per year in direct annual costs in the United States and nearly £1 billion per year in the United Kingdom (Hooman Khademi et al. 2012).

Helicobacter pylori infection is a major cause of morbidity and mortality worldwide. More than 50% of the global population is estimated to be infected. Differences in prevalence exist within and between countries, with higher prevalence seen among people with lower socio-economic status (Hazel Mitchel et al. 2016).

H. Pylori infection is the main cause of dyspepsia, mucosa associated lymphoid tissue lymphoma, and gastric cancer. Eradication of H. pylori has been shown to prevent the recurrence of dyspepsia, including gastric and duodenal ulcers (Hentschel et al. 1993).

H. Pylori (H. pylori) infection is widely accepted as the most important factor in the pathogenesis of dyspepsia (Hyuk Lee et al. 2014). However, in parallel with more effective eradication of H. pylori, the prevalence of H. pylori is changing, and H. pylori-negative dyspepsia appears to be increasing. When making a diagnosis of H. pylori-negative dyspepsia, it is essential to avoid misclassification because of inaccurate diagnosis (Carolyn et al. 2002).

H pylori causes chronic gastritis and is associated with a higher incidence of peptic ulcer, gastric adenocarcinoma and mucosa-associated lymphoid tissue (MALT) lymphoma (Suerbaum et al. 2002). Peptic ulcer disease and localized, low-grade MALT lymphoma are undisputed indications for treatment (Bazzoli et al. 2002). In other conditions, such as gastric cancer among first- degree relatives, patients with atrophic gastritis and dyspeptic patients with proven infection, there is a general consensus that H pylori eradication is also indicated. Even asymptomatic subjects with H

pylori infection for any reason should be informed about risk of infection-related complications, and cost-benefit of treatment discussed in a case-by-case analysis (Forman et al. 2004; Miehlke et al. 2001).

H. Pylori (H. pylori) is acquired during childhood and has a long life in the absence of treatment. Infection could be acquired at any age (Graziella et al. 2012.) however, the incidence is higher in children. The prevalence of H pylori in childhood (<10 years) was reported 80% in developing countries. (Chi et al. 2009; Luneta et al. 2014; Gold, 2001). The infection rate among children has reached to 50-60% in Bangladesh, 48% in Ethiopia and 50% in Egypt (Iwanczak et al. 2012).

Although several different treatment regimens have been proposed for H pylori eradication, triple therapy with a proton pump inhibitor (PPI), clarithromycin and amoxicillin is the most accepted therapy worldwide (Malfertheiner et al, 2002; Nashet al. 2003). The eradication rate obtained with this combination is rather variable, ranging from less than 50% (Altintaset al. 2003). To more than 95% (Della et al, 2002). There are important regional or geographical differences in success rates that have not been completely understood (Nashet al. 2003). Length of treatment, antibiotic dosage, bacterial resistance and other factors could be related to this variability. According to (Loren et al, 1998.) all currently approved regimens for H. pylori eradication in the U.S. require 14 days of combination therapy.

The first-line choice of treatment for H. pylori eradication has consisted of conventional triple therapy, which includes a proton pump inhibitor (PPI), clarithromycin and amoxicillin for 7–14 days in the United States and Europe (Malfertheiner et al. 2007; Chey et al. 2007). In a second Asian-Pacific consensus, conventional triple therapy is also recommended as a first-line therapy (Fock et al. 2009). During the past few years, however, the efficacy of conventional triple therapy has decreased, with eradication rates of less than 80% (Kim et al. 2007; Chung et al. 2011). Decreased eradication rates are due primarily to increased bacterial resistance to clarithromycin, indicating the need for new first-line treatments.

Among the first-line treatment options under development are sequential therapy regimens, which have shown higher eradication rates than conventional triple therapy in several meta-analyses conducted in Europe (Jafri et al. 2008; Gatta et al. 2009; Zullo et al. 2007). In contrast to this result, a recent large scale trial in Latin America shows 14-day conventional triple therapy has a 5.6%

higher eradication rate than 10-day sequential therapy (Greenberg et al. 2011). This discrepancy might be related to the regional antibiotics resistance rate. However, few studies have analyzed culture-based results (Sirimontaporn et al. 2010; Zullo et al. 2003; Vaira et al. 2007).

The choice of a second line treatment depends on which treatment was used initially. If a clarithromycin based regimen was used a metronidazole based regimen should be used afterwards, and vice versa. It seems unwise to use the same antibiotic twice (Wink, 2000.) Even if sequential therapy have significantly high eradicating rate of H. pyori in Europe, clinical trial done in Brazil showed standard triple therapy is equally effective as sequential therapy in eradicating H. Pylori patients (Jaime et al. 2015).

Several large clinical trials and meta- analyses have shown that the most commonly used first- line therapies-including proton pump inhibitors (PPIs) plus two antibiotics-may fail in up to 20% of patients (Della et al. 2002; Gisbert et al. 2000.) and in the clinical routine setting, the treatment failure rate might be even higher. Moreover, during the last few years, the efficacy of PPI-based regimens seems to be decreasing, and several studies have reported intention-to-treat eradication rates lower than 75% (Gisbert et al. 2007; Hawkeyet al. 2003; Paoluziet al. 2006; Vakilet al 2004; Calvet et al. 2005.) and even lower than 50% (Gumurdulu et al. 2004; Altintas et al. 2004). Antibiotic resistance to clarithromycin has been identified as one of the major factors affecting our ability to cure H pylori infection, and the rate of resistance to this antibiotic seems to be increasing in many geographical areas. According to Guilherme et al. (2010.) the widespread use of nitro imidazolic compounds to treat parasitic infections, sexually transmitted diseases, and gynecological infections might be responsible for the significant reduction in H. pylori metronidazole sensitivity.

H. pylori infection is prevalent in Iran, and the estimated prevalence of H. pylori infection is reported 65 % (Mirzaei et al. 2013). H. pylori cure rates are reported different in different geographical regions because of hosts as well as in H. pylori strains. Successful treatment of H pylori infection causes not only eradication of pathogen but also cures and prevents the associated diseases such as dyspepsia, gastric carcinoma and lymphoma (Hu et al. 2009; Houben 1999.)

The most successful eradication therapy includes combination treatment regimen in which the number, the frequency and the duration of medications and therapy should be considered the prolongation of duration of treatment regimens did not improve the eradication rate. The clarithromycin/amoxicillin triple therapy is effective in treatment of H. pylori as well as sequential and levofloxacin based-regimen (Ayman et al. 2014.)

Ten-day sequential therapy, with an eradication rate of 98%, was proposed in (Zullo et al. 2000.) It consists of 5-d dual therapy (PPI plus amoxicillin), followed by 5-d triple therapy [PPI plus clarithromycin and a nitronidazole (metronidazole or tinidazole)]. Compared to 7-d standard triple therapy, sequential therapy was found to result in higher eradication rates (intention-to-treat 92% vs75%; per-protocol 95% vs77%) (Jyh et al. 2014.)

2. Objective

2.1. General objective

- To assess the management of dyspepsia disease in Addis Ababa health centers.

2.2. Specific objectives

- To determine the proportion of patients with dyspepsia who received inappropriate management
- To assess factors that are associated with inappropriate management of dyspepsia
- To identify the commonly used drugs in the management of dyspepsia
- To determine the proportion of patients with dyspepsia who received additional NSAIDS
- To assess the extent of adherence of health professionals to the FMACA standard treatment guideline in the management of dyspepsia.

3. Methodology

3.1. Study area and period

Addis Ababa is the capital city of Ethiopia, which has ten sub cities and a population of 3.38 million. Health centers provide primary health care services to the population of the city. There are 85 health centers in the city; one health center serves up to 25,000 population (MOH, 2010). The study was conducted in 14 health centers in Addis Ababa from September 2016 to January 2017.

3.2. Study design

Health center based cross-sectional study design was used.

3.3. Population

3.3.1. Source population

All dyspepsia patient attending the OPD of selected health centers of Addis Ababa.

3.3.2. Study population

All dyspepsia patient attending the OPD of selected health centers of Addis Ababa who fulfill the inclusion criteria of the study during the study period.

3.4. Inclusion and exclusion criteria

Above 12 years old, no restrict gender with confirmed dyspepsia were included. Exclusion criteria were patients under 12 years old, pregnant, lactating, complicated peptic ulcer disease, allergic to the drugs in this study, dysfunction of heart, liver, and kidney. Only patient who fulfil the inclusion criteria are registered by using the data extraction tool which gather the participant information in presence or absence of H. Pylori, the method detection, usage of NSAIDs, Pattern of therapy (mono, combination and sequential), demographic data (age and gender) and the Drug usage (drug name, dose, dosage form, frequency, duration and costs).

3.5. Sample size determination

A multistage sampling method was used to determine the sample size. A simple random sampling was followed for selecting the appropriate sample of a patient. The total number of sample fulfilling the inclusion criteria was arranged and quota was given based on the calculated sample size so that sample can be representative to show patient with dyspepsia in the health centers of Addis Ababa city administration.

$$n = \frac{[Z1-a/2]^2 P(1-p)}{D^2}$$

Where: n = the minimum sample size required

P= estimated prevalence rate of population

D= the margin of tolerance

Z= the standard normal variation at confidence level and α is mostly 5 % and with 95% confidential level

The minimum sample size required will obtained by taking a prevalence rate of 50% (0.5) and confidence interval of 95% and the margins of error is 5%(0.5)/.

The sample was calculated as

$$n = \frac{[1.96]^2 0.5(1-0.5)}{(0.5)^2} = 384$$

10% of the n value was added for contingency and the result was multiply by 2 because the sampling was a multistage.

By using this formula, a total of 845 medical records of patient with the diagnosis of dyspepsia were review for to assess the management of dyspepsia.

3.6. Sampling procedure

The sampling procedure were done by simple lottery methods with cluster sample, Addis Ababa city administration has 10 sub cities. There are 85 health centers in all 10 sub cities. Addis Ababa city was first stratify by each sub-city and by using simple lottery method four sub city were choose and each sub city was consider as a cluster and within each sub-city by using simple lottery method the investigator was randomize for health center in each sub-city totally 14 health center were used. The number of health center in each sub city determined proportionally by the total number of health center in each sub city. A simple random sampling was used for selecting the appropriate sample from patient profile chart and used to assess the management of dyspepsia in Addis Ababa health center.

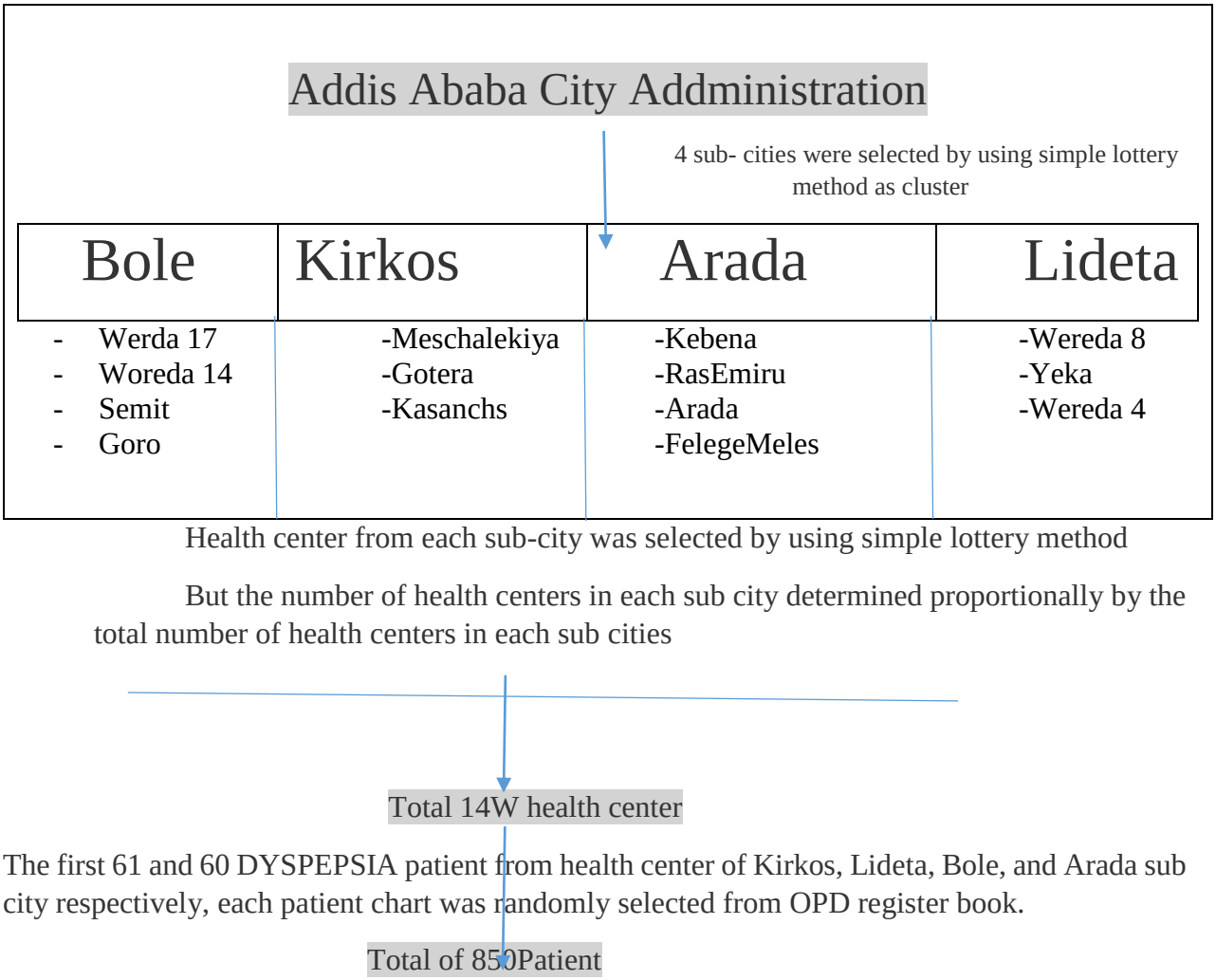


Figure 1: Multistage sampling of the patient from Addis Ababa city administration health center.

3.7. Variables

3.7.1. Independent variables

- Demographic characteristics: age, sex,
- Socio economic factor:
    - economic status,
    - Smoking
    - Alcohol
- Investigation (types of H. pylori test)
    - Stool antigen test
    - Blood Antibody test
- Disease related variable:
    - Relapse
    - New
- Cause Related Variable
    - H. Pylori
    - NSAIDS
    - Stress
- Drug related variable:
    - Type of drug or regimen prescribed
    - availability of the drug
    - Duration of treatment

3.7.2. Dependent variables

- practice of appropriate dyspepsia management

3.8. Data collection procedure

3.8.1. Data collection instrument

A data extraction format (annex I) were used to extract relevant information from the patient chart for the study of the management of dyspepsia in Addis Ababa city administration health center after reviewing literature, FMHACA guidelines and based on the objective of the study and those data extracted from patients medication records.

3.8.2. Data collection technique

A medical record review was performed and a data abstraction format was completed for each eligible patient to obtain Socio-Demographic, Disease related, Investigation, cause of dyspepsia, Life style, drug related information and adherence to FMHACA guideline.

3.8.3. Data collectors

Two nurses at each HC were recruited as a data collector. All the data collectors were given a half day training prior to data collection on how to use the data abstraction format to gather information from patients' medication record.

3.8.4. Data quality control

To ensure data quality, pretest of data collection checklist was done on (5%) of the total sample which is on 43 randomly selected patients at Bole bulbual HC to ensure the agreement of the data extraction format with the need of the study. Supervision and checking was made by the principal investigator to ensure the completeness and consistency of the collected data. All collected data were examined for completeness and consistency during data analysis.

3.8.5. Data entry and analysis

The data was entered into SPSS, version 20.0, this software was used to analyze the data. Descriptive analysis was used to present the demographic data. Logical regression was used to analysis the association between independent variables and appropriate management of dyspepsia by using crude odds ratio (COR) and adjusted odds ratio (AOR) at 95% confidence level. A p-value of less than 0.05 was considered statistically significant.

3.8.6. Operational definition

H. Pylori means Helicobacter bacteria which lives in acidic environment. FD means functional dyspepsia. PUD means peptic ulcer disease. NSAIDs means any of non-steroidal anti-inflammatory drug used for pain management e.g. Aspirin, Diclofenac, Ibuprofen, etc. PPI means proton pump inhibitor like omeprazole, esomeprazole, pantoprazole, etc. H2RB means histamine 2 receptor blocker like cimetidine, ranitidine, famotidine, etc. Triple therapy means using one antacid+ tow antibiotic. Sequential treatment means first use one antibiotic for 5 days and continue by adding antacid after 5 days.

Appropriate management means treatment of dyspepsia based on FMHACA health center treatment guide line.

Smoking status include only for those currently smoke cigarette, also works for Kchat and alcohols use status.

Relapse means the patient came more than one time for the indication of acid related disorder and got treatment more than one times.

3.8.7. Ethical consideration

Ethical clearance was obtained from the ethics review committee of Addis Ababa University, School of Pharmacy and Addis Ababa city administration health bureau institutional review board. A support letter was obtained from the health bureau to Kirkos sub city health office, Arada sub city health office, Lideta sub city health office and Bole sub city health office. A support letter was written from the four sub cities health offices to HCs residing in each sub city. Permission was obtained from each HC medical director to access medication records and conducts the study. To ensure confidentiality, name and other identifiers of patients and health care professionals was not recorded on the data collection tools.

4. Results

4.1. Socio-demographic characteristics

A total of 850 patient presenting with dyspepsia disease were enrolled in the study from fourteen health centers under Addis Ababa city administration. Majority of study participants were female 494 (58.1 %) and Majority of study participants were age of from 16 to 30 account 394 (46.4%) (Table 1).

Table 1: Socio-Demographic characteristics of patients with dyspepsia who attended in selected health centers of Addis Ababa, 2016.

Variable	Frequency	Percent
Sex		
Female	494	58.1
Male	356	41.9
Age		
0-15	19	2.2
16-30	394	46.4
31-45	216	25.4
46-60	138	16.2
>61	83	9.8
Marital Status		
Single	238	28
Married	425	50
Divorced	187	22
Cigarette Smoker		
Yes	114	13.4
No	736	86.6
Alcohol Drinker		
Yes	302	35.5
No	548	64.5
Khat Chewer		
Yes	136	16
No	713	83.9
Source of Therapy		
Government (free)	541	63.6
Out of pocket	309	36.4

4.2. Laboratory and clinical characteristics

For the majority of participant (74.4 %) stool antigen test was done whereas the rest received an Antibody test out of the total study participants. 632 (74.4%) were found to be H. Pylori positive and 613 (72.1 %) were Naive dyspepsia patient (table 2)

Table 2: Laboratory and clinical characteristics of patients with dyspepsia who attended selected health centers of Addis Ababa, 2016.

Variable	Frequency	Percent
Laboratory Investigation		
Stool Antigen test	632	74.4
Blood Antibody test	218	25.6
Cause of DYSPEPSIA		
H. Pylori	630	74.1
NSAIDs	98	11.5
Stress	122	14.4
Relapse or New DYSPEPSIA		
New	613	72.1
Relapse	237	27.9

NSAIDs- Non steroidal anti-inflammatory drugs

4.3. Management of dyspepsia

Majority of study participant were treated by triple therapy which accounts 559 (65.8 %), and 291 (34.2 %) of the study participant used mono therapy. From the overall utilization of drug therapy Omeprazole were the commonly used drugs which account 215 (25.3%), followed by Histamine 2 antagonist 27(3.2%) and antacid 53 (6.2%). Out of those patients who received Triple therapy from the overall utilization of drug therapy Omeprazole 20mg + Amoxicillin 1000mg + Metronidazole 500mg were the major regimen accounting 328 (38.6 %) (Table 3).

Table 3: Prescribing patterns for treatment of patients with dyspepsia who attended in selected health centers of Addis Ababa, 2016.

Variable	Frequency	Percent
Mono Therapy	*291*	34.2
Omeprazole 20mg BID	215	25.3
H2R Antagonist (cimetidine)	27	3.2
Antacid (Mg* +Al* +/- Simethicon	53	6.2
Triple Therapy	559	65.8
Ome* + Amo* + Met*	328	38.6
Ome* + Amo*+ Clar*	188	22.1
Ome* + Met* + Clar*	39	4.6

Ome*- Omeprazole 20mg, Amo*- Amoxicillin 1000mg, Met*- Metronidazole 500mg, Clar*- Clarithromycin 500mg, H2R- Histamine 2 receptor.

With respect to duration of treatment only 170 (20.2%) of patients received a 14 days duration of treatment, figure 2.

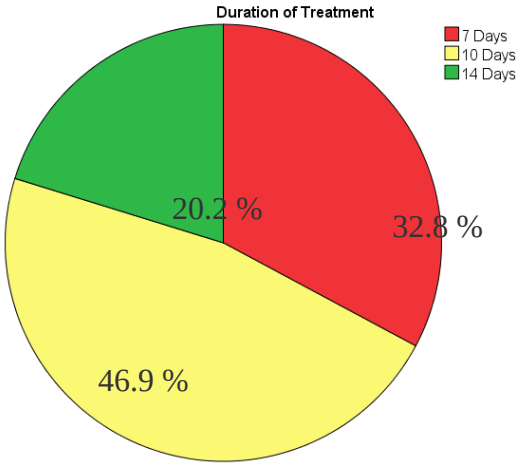


Figure 2: Duration of treatment for patients with dyspepsia who attended selected health centers of Addis Ababa, 2016.

Moreover, almost half number of study participants used additional non-steroidal anti-inflammatory drugs for pain management (Figure 2)

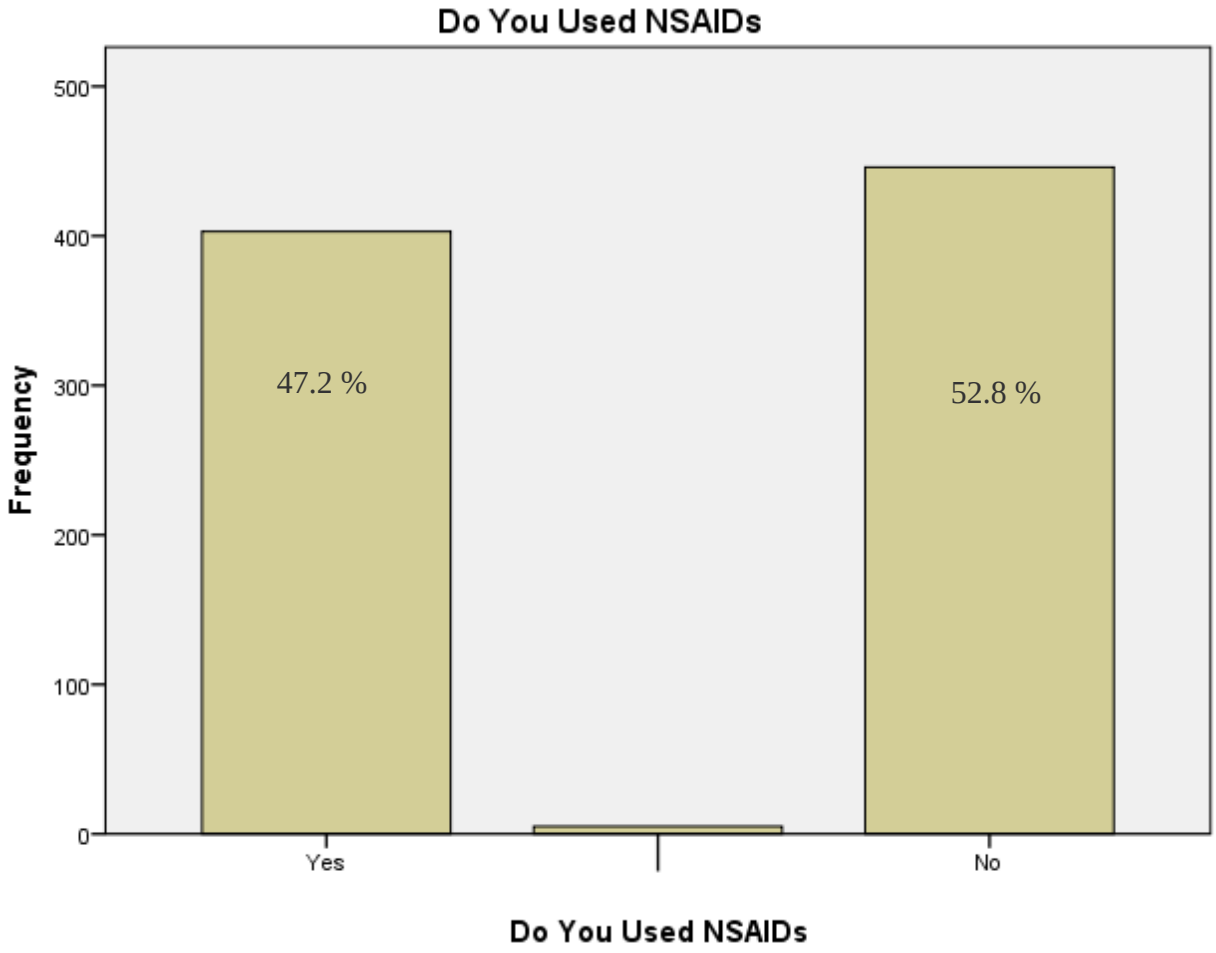


Figure 3: Use of NSAIDs as additional pain management among patients with dyspepsia who attended selected health center of Addis Ababa, 2016.

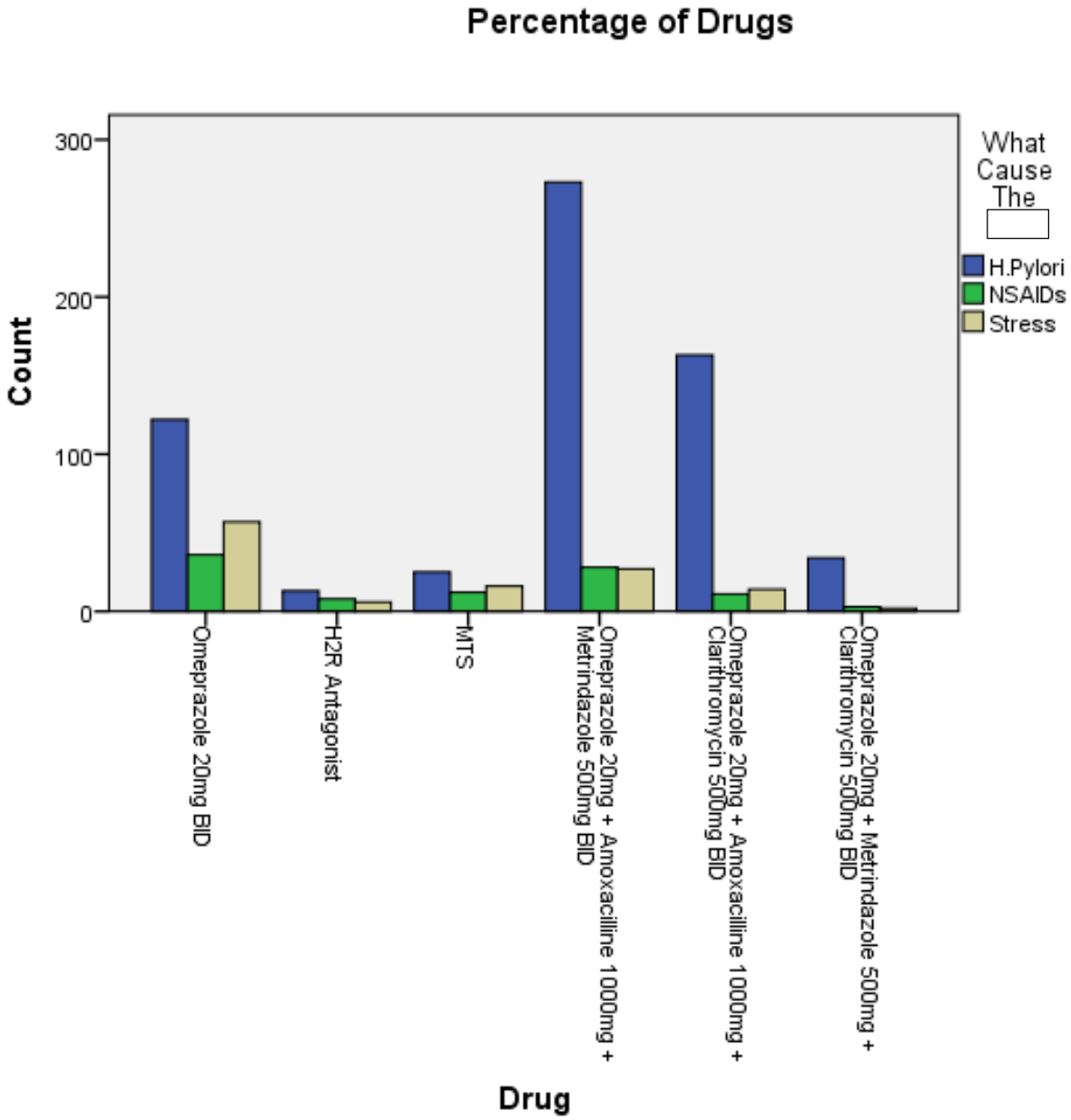
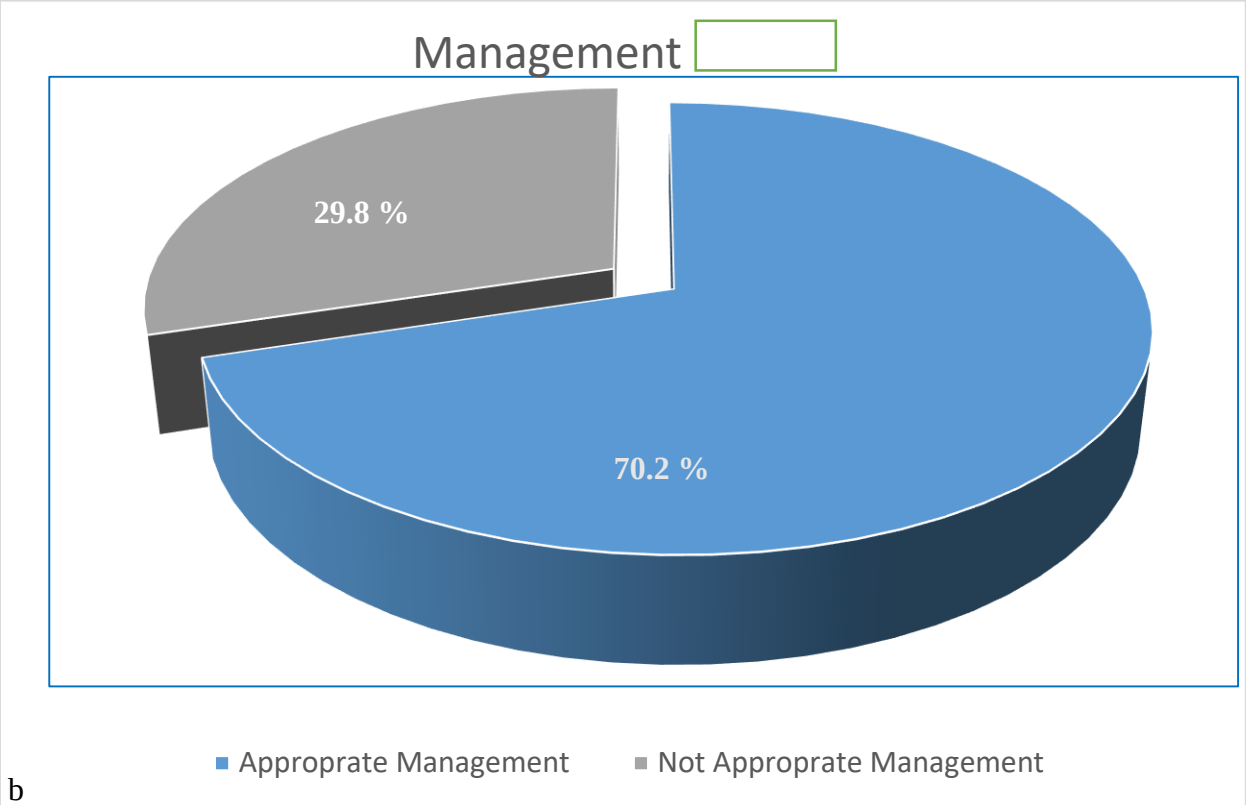


Figure 4: Prescription pattern based on clinical classification among patients with dyspepsia who attended selected health centers of Addis Ababa, 2016.

4.4. Appropriate management of dyspepsia

Based on FMHACA health centers treatment guideline 597 (70.2 %) of the study participant have received appropriate management of dyspepsia.



b

Figure 5: The prevalence of appropriate management in health center.

Table 4: Indicators of inappropriateness of the management of patient with dyspepsia.

Management	Number	Percentage
Patient received additional antibiotic that wasn't needed	85	10 %
Patient needing additional antibiotic that was not received	160	18.88 %
Patient with dyspepsia who were inappropriately managed.	**245**	**28.88 %**

Table 5:

4.5. Factors associated with inappropriate management of dyspepsia

In order to identify the association of independent variables with appropriate management of dyspepsia both bivariate and multivariate analysis were used by categorizing the dependent variable in to appropriate and inappropriate management of dyspepsia as shown in table 6 below.

Regarding appropriate management based on caused of dyspepsia patients with NSAIDS are less likely appropriately managed (AOR= .718(.441, 1.168); P=0.001) than H. Pylori (AOR= 1; P= 0.001) and Stress (AOR= 1.642(.893, 3.021) but statically significant association were show on appropriate dyspepsia management of NSAIDS and H. Pylori caused patients (p=0.001and p=0.005) respectively. Patients age from 16 to 30 were shown more likely to have appropriate management and also patient age <15 (AOR = (1.088(.298, 3.974)) compared to ages 31 to 45 (AOR = (.980 (.502, 1s331.914)) ; ages 46-60 (AOR = (.892 (.455, 1.747)) and ages >61 (AOR = (.890(.445, 1.780)) and the odds of appropriate management of dyspepsia for patient with relapse dyspepsia were (AOR = (.307(.207, .457)) less likely compared to NEW but it show statically significant with a P=0.000 and also management with H2R blockers were show statically significant with a P=0.046.

Table5: Association of appropriate management of dyspepsia and independent variables

Variable		Appropriate management		COR (95% CI)	AOR (95% CI)	A
		NO (%)	YES (%)			
SEX	Female	150 (17.66)	344 (40.51)	1.00	1.00	
	Male	103 (12.13)	252 (29.68)	1.671 (.791, 1.438)	1.038(.731, 1.472)	.837
`AGE	0-15	8 (0.94)	11 (1.29)	1.156 (.687, 1.943)	1.088(.298, 3.974)	.899
	16-30	126 (14.84)	268 (31.56)	1.00	1.00	
	31-45	56 (6.59)	159 (18.72)	1.788 (.640, 4.993)	.980 (.502, 1.914)	.953
	46-60	39 (4.59)	99 (11.66)	.866 (.493, 1.522)	.892(.455, 1.747)	.738

	61-90	24 (2.82)	59 (6.94)	.968 (.530, 1.768)	.890(.445, 1.780)	.743
MARITAL STATUS	Single	81 (9.54)	157 (18.49)	.688 (.451, 1.050)	1.097(.677, 1.776)	.708
	Married	123 (14.48)	301 (35.45)	1.00	1.00	
	Divorced	49 (5.77)	138 (16.25)	.869 (.590, 1.280)	1.390(.759, 2.546)	.286
CIGARETTE SMOKING	Yes	217 (25.55)	518 (61.01)	1.00	1.00	
	No	36 (4.24)	78 (9.18)	.908 (.593, 1.389)	.969(.587, 1.600)	.903
SOURCE OF MEDICATION	Free	166	375	1.00	1.00	
	Out of Pocket	87	221	1.124 (.826, 1.530)	1.165(.814, 1.666)	.403
LABORATORY INVESTIGATION	Antigen	183 (21.43)	449 (52.88)	1.00	1.00	
	Antibody	71 (8.36)	147 (17.31)	.839 (.602, 1.169)	.895(.608, 1.317)	.573
	H. Pylori	159 (18.72)	471 (55.47)	1.00	1.00	.005
TYPE OF DYSPEPSIA	NSAIDs	47 (5.53)	50 (5.88)	.539 (.359, .809)	.718(.441, 1.168)	.001
	Stress	47 (5.53)	75 (8.83)	1.500 (.874, 2.574)	1.642(.893, 3.021)	.178
RELAPSE OR NEW	NEW	123 (14.48)	489 (57.59)	1.00	1.00	
	RELAPSE	130 (15.31)	107 (12.60)	.207 (.150, .286)	.307(.207, .457)	.000
PRESCRIBING PATTERNS	Single Therapy	163 (19.19)	127 (14.95)	1.00	1.00	
	Dual Therapy	2 (0.23)	5 (0.58)	6.767 (4.889, 9.368)	1.668(.181,15.379)	.651
	Triple Therapy	88 (10.36)	464 (54.65)	2.109 (.403, 11.043)	1.964(.342, .11.268)	.449
	Antacid Only	163	127	.150 (.108, .207)	.846(.059, 12.072)	.902

	Antacid & Antibiotic	90	469	1.00	1.00	
	Ome*	126	88	.103 (0.39, 0.273)	1.687(.136, 20.975)	.684
	H2R	13	14	.158 (0.47, .528)	2.903(.273,30.921)	.046
	MTS	26	27	.153 (0.52, .451)	1.448(.121, 17.396)	.770
	Ome* + AMO* + MIt	57	271	1.00	1.00	
	Ome* + AMO* + CLAR*	26	162	.699 (.262, 1.865)	1.176(.429, 3.226)	.752
	Ome* + CLAR* + MIt	5	34	.916 (.328, 2.556)	.997(.348, 2.858)	.995
NSAIDS USE	NO	135	284	1.045 (.778, 1.403)	1.219(.865, 1.717)	.257
	YES	118	311	1.00	1.00	
DURATION OF TREATMENT	7 DAYS	106	172	0.646 (.429, .974)	.828(.521, 1.317)	.426
	10 DAYS	98	301	1.00	1.00	
	14 DAYS	49	123	1.224 (.819, 1.829)	1.023(.622, 1.682)	.930

P<0.05- Statistically Significant, Ome- Omeprazole 20mg, AMO*- Amoxicillin 1000mg, Met*- Metronidazole 500mg, CLAR*- Clarithromycin 500mg, H2R- Histamine 2 Receptor antagonist, MTS- Antacid

5. Discussion

This study provided important information about dyspepsia patient's treatment at health center. Most patients were young with female dominance, the leading underlying cause is H.Pylori and most common treatment were conventional triple therapy. (29.8%) of the patients had inappropriate management.

The results showed that 494 (58.1 %) patients out of 850 of the dyspepsia were female while 356 (41.9 %) were male hence the number of females was more than the male. From the results of the data got indicated that more women suffer from dyspepsia than men in the health center of Addis Ababa the same to hospital based studies from China and Tehran where women had a higher dyspepsia rate than men (Hooman Khadem et al., 2012; Yangchun Zhu et al., 2013).

About (58.1%) Female is lower than study obtained from tertiary and secondary facility based studies from Nigeria (75.8%) and higher from health center based studies Malaysia (37%) (Almeman et al., 2013), but had similarity from hospital based studies at Taiwan (55.77%) (Yang-Pei Chang et al., 2013), (56.9%) (His-Chang Lee et al., 2013) respectively and hospital based studies from Japan (52.5%) (Daisuke Asaoka et al., 2014), Taiwan (60%) (Hsiang-Yao Shih et al., 2013), Korea (65.5%) (Hyo Jun Ahn et al., 2017).

(41.9%) male were higher than studies obtained from Nigeria (28.3%) tertiary and (33.8%) secondary health care based retrospective study (Kadiri et al., 2015), less than hospital based studies from India (73.6%) (Jayaram et al., 2014), Bangladesh (62.8%) (Rafi A. H. Siddique, 2016), Tanzania (57.1%) (Chalya et al., 2011), Korea (63.9%), Thailand (51%) (TaweesakTongtawee et al., 2016), Japan (52.5%) (Daisuke Asaoka et al., 2014), (76.6%) (DucTrong Quach et al., 2016) health center based studies from Malaysia (63%) (Almeman et al., 2013) the study were similar to the result obtained from medical center based studies from Kenya (45.77%) (Kamau, 2007, Hospital based studies from Taiwan (43.1%) (His-Chang Lee et al., 2013), (40%) (Hsiang-Yao Shih et al., 2013), Korea (40.5%) (Hyo Jun Ahn et al., 2017).

Out of 850 dyspepsia 394(46.4%) patients were 16-30 years age group which highly suffered by dyspepsia, 216(25.4%) are age groups from 31-45 years, 138 (16.2%) are age groups from 46-60, 83(9.8%) are age groups greater than 61 and the least patients age groups which affected by dyspepsia were less than 15 years old.

The same to this study in both tertiary and secondary healthcare facility based retrospective study those 21-30 years of age had the highest percentage of dyspepsia (Kadiri et al., 2015), Tanzania (median age group was 28 years) (Chalya et al., 2011) but this study were different from hospital based retrospective studies from India (51.86+/- 17.5 Years) age group were highly had DYSPEPSIA (Jayaram et al., 2014), Health center based studies from Malaysia (46+/-9.7 Years) (Almeman et al., 2013), Population based studies from Taiwan (79.41 +/- 9.64 Years) (Yang-Pei Chang et al., 2013), Hospital based studies from Taiwan (53.1 +/- 15 Years) (His-Chang Lee et al., 2013), (57.6 +/- 12.7 Years) (Hsiang-Yao Shih et al., 2013), Japan (63.1 +/- 8.8 Years) (Daisuke Asaoka et al., 2014), (55.4 +/- 17.3 Years) (DucTrong Quach et al., 2016), China (mean 50.15 Years) (Yangchun Zhu et al., 2013), Korea (47.99 +/-10.86 Years) (Sung-Goo Kang et al., 2013), (56.13 +/- 12.01 Years) (Sung Min Jung et al., 2015), (57.37 +/- 7.62) (Hyo Jun Ahn et al., 2017).

The result of the studies also shows that Addis Ababa city administration health center favors stool antigen (74.4%) test than blood antibody (25.6%) tests, even if it's failed to show statically significances that (6.47%) of relapse patients were used Antibody test for dyspepsia that directly affect the appropriateness of dyspepsia because antibody can be found in our body for the long time after the eradication of the bacteria so positive antibody test might miss lead the health officer and prone the patient to unnecessary antibiotic used which affect patient economic and life style by increasing pill burden and management cost.

Serologic tests only detect antibodies and cannot reliably distinguish between ongoing and cured infections. Urea breath tests and fecal antigen tests are recommended as non-endoscopic pretreatment testing for active infections. Endoscopy for patients aged 50 years or older with new-onset dyspepsia. Prompt endoscopy is generally not recommended for patients aged 18 to 49 years with dyspepsia. Prompt endoscopy is reserved for older patients (aged >45-55 years) and for patients with alarm features. (Collin W. Howden, et al., 2007)

The results of the study showed that 630 (74.1%) out of 850 dyspepsia caused by H. Pylori infection that indicate that most patient suffered by dyspepsia in the study is caused by bacteria which called H.Pylori the rest (11.5%) and (14.4%) were caused by NSAIDS and Stress respectively. Study shows significant association by COR P= 0.001 between the causes of dyspepsia with appropriate management. Appropriate management based on the cause of

dyspepsia patients with NSAIDS less likely (AOR= .718(.441, 1.168) compared to H. Pylori (AOR= 1 ; P= 0.005) and Stress (AOR= 1.642(.893, 3.021) and also significant association were show appropriate dyspepsia management's on NSAIDS and H. Pylori caused patients (p=0.001and p=0.005) respectively.

The result of the studies show 429(47.2%) of dyspepsia patient used NSAIDS as additional pain management from those (71.2%) dyspepsia patients have appropriately managed. When compared to patient who does not receive NSAIDS as cocktail which have 47..5% vs 37.9% chances for appropriate management

The result of the studies show 559(65.8) and 291 (34.2) out of 850 were used Antacid + Antibiotic and Antacid only respectively for the treatment of dyspepsia. Studies show significant association between prescription pattern and appropriate management of dyspepsia that is patient with the prescription of Antacid + Antibiotic were 6 times to had more appropriate management than patient with Antacid only treatment odd ratio = 6.888 with 95% confidential interval of (4.839, 9.243) with the p=.000 which show statically significant. The result of the study shows mostly used mono therapy drugs were; Omeprazole 215(25.3%) compared to other anti-ulcer mono therapy drugs such as H2R Antagonist 27(3.2%) and Antacid 53(6.2%). And also the result of the study shows mostly used triple therapy drugs were; Omeprazole 20mg + Amoxicillin 1000mg + Metronidazole 500mg 328(38.6%) compared to other drugs such as Omeprazole 20mg + Amoxicillin 1000mg + Clarithromycin 500mg 188(22.1%) and Omeprazole 20mg + Metronidazole 500mg + Clarithromycin 500mg 39(4.6%).

Multivariate analysis show association between appropriate management with the choice of drugs but its failed to show statically significances from drugs used as mono therapy Omeprazole (88) out of (216) patients with odd ratio = 1.687 with 95% confidential interval of (.136, 20.975) p=.684; H2R antagonist (14) out of (27) patients with odd ratio = 2.903 with 95% confidential interval of (.273, 30.921) p= 0.46 and Antacid (27) out of (53) patients with odd ratio = 1.448 with 95% confidential interval of (.121, 17.396) were appropriately managed. From triple therapy omeprazole 20mg + Amoxicillin 1000mg + Metronidazole 500mg (271) out of (328) patients; omeprazole 20mg + Amoxicillin 1000mg + Clarithromycin 500mg (162) out of (188) patients with odd ratio = 1.176 with 95% confidential interval (.429, 3.226) p= .752 and omeprazole 20mg + Metronidazole 500mg + Clarithromycin 500mg (34) out of (39) patients with odd ratio= .997 with

95% confidential interval (.348, 2.858) p=.995 were appropriately managed in Addis Ababa city administration health centers.

6. Limitation of the study

Since the research design was retrospective, it was not possible to capture all the necessary data on the patient chart because of incomplete or missing documentation, poorly recorded and absent information. In addition the study was also conducted in limited health centers found in AA. So any effort to extrapolate the results beyond the study population should be done with caution finally, though the current study tried to assess the practice of dyspepsia management in AA health centers, it did not include treatment outcome as one parameter.

7. Conclusion

The result of this study have revealed that one third of patient with dyspepsia were in appropriately managed. Also the result of the study show a very high use of proton pump inhibitor and amoxicillin among the drug group, and also the result of the study show nearly half of the patient used non-steroidal anti-inflammatory drugs as analgesic which is also the cause of the disease and high number of patient were treated for ten days duration.

8. Recommendation

Based on the finding of this study, the following recommendations are forwarded

- The health professional need update themselves
- The health professional must use NSAID with caution for dyspepsia patient
- The health professional need to use stool or serological diagnostic method accordingly diagnostic guide lines
- The health professional must treat dyspepsia with appropriate duration
- The health professional should strictly follow the recommended FMHACA health center treatment guide lines in the management of dyspepsia
- FMOH/AAHB should facilitate training on the management of dyspepsia and monitor whether the health professional are follow the recommended guide lines in the management of dyspepsia

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Annexes

Socio demographic characteristics

1. **Age (Years):**_____
2. **Sex:** ___ M ____ F
3. **Anthropometry**: Weight (Kg)___ Height (M): ___
4. **Religion:** Orthodox: ___ Muslim: ____ Catholic: ____ Protestant: _____ Other: _____
5. **Ethnicity:** Oromo: ____ Amhara: _____ Tigre: _____ Gurage: _____ Other: _____
6. **Marital status:** Married: _____ Divorced: _____ Single: _____ Window: _____
7. **Education Level:** No formal Education: ___ Primary School: _____ Secondary School: _____ Collage/University: _____
8. **Work Status**: House wife: _____ Government employee: _____ Un-employed: _____ Retired: _____ Private Business: _____ Farmer: _____ Daily laborer: _____ Student: _____ Other(s) [Specify]: _____
9. **Family monthly income**: _____

Disease related factor:

1. How long has it been since you were diagnosed with dyspepsia? _____
2. Does the dyspepsia is Relapsed or New? _____
3. If the answer is relapse? First time _____ Second Time: _____ More than TWO times: _____
4. How frequent is the relapse? _____

Life Style:

1. Do you smoke cigarette? Yes: _____ No: _____
2. Do you drink alcohol? Yes: _____ No: _____
3. Do You chew khat? Yes: _____ No: _____

Medication related factor:

1. How do you get your medications? Free: _____ By Sponsorship: _____

   Self-Sponsored: _____

2. Do you use NSAID? Yes: _____ No:

3. If you answer is yes for how long: _____ and how Frequent: _____

Disease Related Factors

1. Do you have complications of peptic ulcer disease (dyspepsia)? Yes ___

   No: __

2. If your answer is yes: Bleeding: _____ Perforation: _____

   Penetration: _____ Gastric Outlet Obstruction: _____

3. Comorbid Condition: Diabetes: _____ CKD: _____ Pulmonary-

   Condition _____ Advanced Malignancy: _____ other

   (Specify): _____

Medication for comorbid conditions:

Drugs dose and frequency

1. _____
2. _____
3. _____
4. _____
5. _____

Card No: _____ Sex: ____ Age:____ Allergies:_____ Ulcer On:_____									DYSPEPSIA associated to H.Pylori		If Yes H.Pylori detection Methods		Present of NSAIDs	Management			Remark
Date	Medication (Generic), Dosage, Dose, Frequency, Duration								Yes	No	Antigen	Antibody		1st	2nd	3rd	
	Antacid dose	Frequency and Duration		Antibiotic 1 dose	Frequency and Duration		Antibiotic 2 dose	Frequency and Duration									