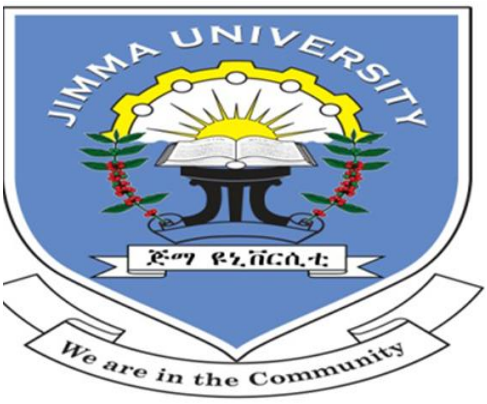

Depression, Anxiety and Stress among Chronic Obstructive Pulmonary Disease patients in Jimma, South West Ethiopia: Comparative cross sectional study.

BY: Yonas Akalu (BSc, Public Health)

A thesis submitted to the Department of Biomedical Sciences, College of Health Sciences, Jimma University, in partial fulfillment of the requirements for the Degree of Master of Sciences (MSc) in Medical Physiology.

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Jimma University

College of Health Sciences

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ABSTRACT

***Background**: Chronic obstructive pulmonary disease is associated with depression, anxiety and stress which are the commonest under treated disorders resulting in significant morbidity and mortality. None of the previous studies addressed the association between depression, anxiety, and stress and chronic obstructive pulmonary disease in the present setup.*

***Objective**: The main aim of the present study was to determine the magnitude of Depression, Anxiety and Stress and associated factors among Chronic Obstructive Pulmonary Disease Patients in Jimma, South West Ethiopia, 2016.*

***Methods:** A comparative cross-sectional study was conducted at Jimma University Specialized Hospital, Jimma, South west Ethiopia among chronic obstructive pulmonary disease (COPD) patients. A total of 130 participants; 65 chronic obstructive pulmonary disease patients and the same number of relatively healthy individuals with matched age and sex characteristics were recruited. Spirometric assessment was done to evaluate severity of COPD. Depression, anxiety and stress scale (DASS 21) was used for the assessment of severity of depression, anxiety and stress. Pearson's correlation was used for examining the relationship between depression, anxiety and stress scores and continues variables. One way ANOVA and independent T-test were used for comparing DAS scores across categories. Simple and multiple linear regression analysis were conducted to identify predictors of DAS. A significance level of $p < 0.05$ was used in all tests.*

***Results**: The patient group showed a statistically significant difference in the prevalence of depression, anxiety and stress (47.7%, 49.2 %, and 56.9% respectively, $p < 0.001$). Depression score was significantly associated with severity of COPD ($p<0.01$). Depression and stress scores were negatively correlated with monthly income ($r=-0.272,-0.303$) and FEV1 ($-0.402, -0.396$), and positively correlated with duration of hospital admission ($r=0.402, 0.344$). Anxiety score was positively correlated with duration of hospital admission($r=0.420$) and negatively correlated with FEV1 ($r=-0.298$). Duration of hospital admission was a common positive predictor for depression, anxiety and stress scores ($\beta =0.156, 0.144$ and 0.123 respectively, $p<0.001$) while FEV1 was a negative predictor of depression ($\beta =-4.209$) and stress score ($\beta =-3.003$), $p <0.001$. Educational level of college and above was a negative predictor of depression ($\beta=-7.100$) and anxiety scores ($\beta = -5.15$, $p<0.05$). Income was a negative predictor of stress score ($\beta = -0.002$, $p <0.05$). Cigarette smoking was a positive predictor of both depression ($\beta=13.39$, $p<0.01$) and anxiety scores ($\beta=6.75$, $p <0.05$) while khat chewing was positive predictor of only depression score ($\beta=5.28$, $p<0.05$).*

***Conclusion:** In the present study, DAS was significantly higher in COPD patients than in healthy controls. Educational status, duration of admission, FEV1, khat chewing and cigarette smoking were predictors of depression score. Similarly, educational status, cigarette smoking, history and duration of admission were predictors of anxiety score. Educational status, income, duration of admission and FEV1were predictors of stress score. These high magnitudes of DAS among COPD patients need urgent intervention. Therefore, equal attention should be given in treating DAS in patients with COPD as that of COPD.*

***Key words:** Depression, Anxiety, Stress, Chronic obstructive pulmonary disease.*

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ACRONYMS

AIDS	=	Acquired Immuno Deficiency Syndrome
ANOVA	=	Analysis Of Variance
COPD	=	Chronic Obstructive Pulmonary Disease.
DALY	=	Disability Adjusted Life Year.
DAS	=	Depression, Anxiety and Stress.
FEV1	=	Forced Expiratory Volume during the first second.
FVC	=	Forced Vital Capacity.
GOLD	=	Global Initiative for Chronic Obstructive Lung Disease.
HPA	=	Hypotalamo-Pituitary Adrenal Axis.
IL	=	Interleukin
JUSH	=	Jimma University Specialized Hospital.
NAChRs	=	Nicotinic Acetyl-Choline Receptors.
SPSS	=	Statistical Package for Social Science Studies.
TNF-α	=	Tumor Necrosis Factor Alpha.

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CHAPTER 1: INTRODUCTION

1.1. Background

According to the Global initiative for Chronic Obstructive Lung Disease (GOLD) chronic obstructive pulmonary disease (COPD) is a common preventable and treatable disease characterized by persistence air flow limitation that is usually progressive and associated with an enhanced chronic inflammatory response in the air ways and the lungs to noxious particles or gases (1). COPD is a term that is used to include chronic bronchitis, emphysema, or a combination of both conditions (2). Chronic inflammation in COPD causes structural changes; narrowing of the small airways, destruction of the lung parenchyma, loss of alveolar attachments to the smaller airways and decrease lunge elastic recoil. These changes in turn diminishes the ability of the airways to remain open during expiration (1). A COPD diagnosis is confirmed by a simple test called Spirometery, which measures how deeply a person can breathe and how fast air can move into and out of the lungs and it is based on the documentation of a post bronchodilator FEV1 /FVC< 70% (3). The GOLD criteria classify severity of air flow limitation in COPD patients with ratio of FEV1/ FVC<0.7, into four stages; Mild (FEV1$\geq$80% predicted), Moderate [50<FEV1<80% predicted), Severe [30<FEV1<50% predicted) and Very severe (FEV1< 30% predicted) (1). Patients with COPD suffered with cycle of dyspnea, deteriorating exercise performance, restricted mobility, social isolation and decrease in peripheral muscle strength (2,4). Main risk factors for COPD are; tobacco smoking, indoor air pollution, outdoor air pollution, occupational dusts and chemicals vapors, irritants, and fumes (5).

Mental health-related disorders specifically, mood disorders such as depression, anxiety disorders, phobias and panic disorders are common in patients with COPD and among these mental illnesses anxiety and depression are the two most common comorbidities of COPD (6). Depression is a common mental disorder that presents with depressed mood, loss of interest or pleasure, decreased energy, feelings of guilt or low self-worth, disturbed sleep or appetite, and poor concentration that often comes with symptoms of anxiety (7). Anxiety was defined as a diffuse, objectless apprehension associated with preparation for possible, upcoming negative events (8). Hypoxia, smoking, inflammation, severity of symptoms and quality of life in COPD patients are assumed to be the cause of depression anxiety and stress. Among these, severity of symptoms and reported quality of life were strongest predictors of depression among patients with COPD (9). Investigating anxiety and depression in COPD patients is

challenging because of significant overlap of symptoms between COPD, anxiety and depression (i.e. dyspnea, chest tightness, palpitations, tremor, fatigue, disordered sleep and loss of appetite) (10,11).

Besides depression and anxiety there is another mental illness called stress. It is a response to a threat or situation that causes discomfort, while anxiety is the result/reaction to the stress. It develops when the body is subjected to a situation or event which it cannot cope with, and hence, responses to it in a physiological way (12).

1.2. Statement of the Problem

Chronic obstructive pulmonary disease is a largely preventable and treatable disease responsible for higher range morbidity and mortality; the fourth leading cause of death worldwide with a substantial economic burden (13,14).

In 2004 WHO estimated that 64 million people worldwide suffer from COPD. It is also predicted that in 2030, COPD will be the third leading cause of death in the world (13,15). This increased mortality is mainly driven by the expanding epidemic of smoking and air pollution, reduced mortality from other common causes of death (like infectious disease and ischemic heart disease) and aging (1). Previously COPD was more prevalent and caused more deaths among males than females (16). Currently the disease affects men and women equally, due to the increased tobacco use among the female population, along with exposure to indoor air pollution by use of biofuels in open fires with insufficient ventilation in low-income countries (15). In 1990 COPD was the 12^{th} leading cause of disability adjusted life year (DALYs) lost in the world and projected to be the 7^{th} in 2030 (17). The global prevalence of COPD ranged from 9.8 to 23% in men and from 5.6% to 11.6% in women (16). In adults 40 years and older the prevalence of physiologically defined COPD was 9% to 10% (18).

The most common lung disorder in USA was COPD. Among those COPD subjects, 80 to 90% of diagnosis were due to smoking (19).

COPD was also highly prevalent in sub Saharan Africa, with the prevalence ranges from 4% to 25% (20). In Ethiopia the prevalence of chronic bronchitis among factory workers was 21.8 % (21).

Recently, there has been increasing recognition that patients with COPD with three or more comorbidities are more likely to be frequently hospitalized and may die prematurely compared with COPD patients without comorbidities (22). Of such comorbidities, mental health problems contribute to a substantial burden of COPD-related morbidity, notably by impairing quality of life and reducing adherence to treatment (23). Globally, mental health problems account for 13% of the total burden of disease, and 31% of all years lived with disability (15). Each year 30 percent of the global population has a mental disorder and up to 2/3 of them will not get adequate treatment (24). In Africa, mental disorders account for 5 per cent of the total burden of disease and 19 per cent of all disability (25). Approximately one out of four people in Africa may experience common mental disorders such as anxiety or depression, with depression having the second highest disease burden on the continent (26).

In sub-Saharan Africa, 20–30% of primary health clinic attendees present with depressive symptoms and other psychological disorders as the first or secondary reason for seeking medical care (27,28). Furthermore, mental disorders were also shown to account for 11% of the total burden of diseases in Ethiopia (29). Populations in many African countries face increased susceptibility to mental illness due to a number of socioeconomic risk factors such as poverty, social inequality, war and conflict, disaster, urbanization and migration (30). Mental health problems specifically anxiety was found to be high among substance(chat, alcohol and cigarette) users (31).

Use of substances such as alcohol, khat(*Catha edulis)* and tobacco has become one of the rising major public health and socio-economic problems worldwide. This problem is specifically high in Jimma with prevalence of 35.5%, 50%, and 68.5% for tobacco uses, drinking alcohol, and chewing khat respectively (32).

In addition to these factors, different chronic illnesses are associated with mental health problem that present as comorbidity. COPD is one the chronic illness that results in high prevalence of mental health problem like depression and anxiety which in turn have significant impact on patients, their families, society, and the course of the disease (33). Generally the estimate prevalence of depression and anxiety in COPD was comparable to or higher than prevalence rates in other advanced diseases such as cancer, AIDS, heart disease, and renal disease (34).

Depression and anxiety are experienced by more than one third of COPD patients (35). Anxiety was too much extent higher in COPD patients with 85% more likely to develop the disorder as compared with healthy, matched controls (36). In Germany, the prevalence of anxiety and depression was 89.9 % and 58.8% respectively (37). It was also high in Africa, particularly, in Egypt the prevalence of depression was (42.5% in COPD patients and 10% in control group) followed by anxiety (22.5% in COPD group and 8% in control group) (38).

In Ethiopia in 2013, the prevalence of common mental disorders in Gondar University Hospital admitted patients was 58.6% (39). These disorders associated with COPD respond well to appropriate pharmacologic and non-pharmacologic therapy, but only a small proportion of COPD patients with these disorders receive effective treatment. Therefore, when recognized, they should be treated since health is regarded as a state of complete physical, social and mental wellbeing (40). Untreated and under-recognized depression and anxiety symptoms in patients with COPD have deleterious effects on physical functioning and on

social interaction, increasing fatigue and healthcare utilization and decreases cigarette smoking-cessation efforts (2,41). Patients with COPD and depression were more often noncompliant with medical treatment, and were associated with higher incidence of mortality (42). The mental disorders themselves can be further aggravated by patients' disabilities and, in turn, they can exaggerate patients' COPD symptoms. Depression has always received greater attention in COPD patients while, anxiety and stress in these patients has received even less attention than depression, despite the fact that anxiety, depression and stress usually occur together in these patients (43)**.**

Besides depression and anxiety, stress is one of the mental illnesses which can also found as comorbidity with COPD. Stress levels in hospitalized COPD patients undergoing treatment during an exacerbation were high. A total of 58.7% of the participants experienced stressful situations differently (44).

The mortality rate among depressed COPD patients during a 3-year period was increased (45). In US COPD patients with comorbid depression were 77% more likely to have a COPD-related hospitalization, 48% more likely to have an emergency room visit compared with COPD patients without comorbid depression, resulting in significantly inflated average annual cost. The average annual all-cause medical cost per patient was $23,759 for COPD-depression versus $17,765 for COPD only (46). Particularly, depression was strong predictor for mortality in COPD and its predictive ability persists over the effects of other prognostic factors, like physiological factors, demographic factors, and disease severity (45,47,48).

There are some important findings regarding pulmonary rehabilitation, smoking cessation, and psychological and antidepressant drug therapy in reducing anxiety, depressive and stress symptoms in patients with COPD (49). But still there is a problem of early detection and treatment of these comorbidities for decreasing morbidity and mortality of COPD. Therefore identifying depression, anxiety and stress, and developing appropriate treatment strategies as early as possible are critical to improve the quality of life of COPD patients and decrease the growing public health impact of COPD. This study will assess magnitude of depression, anxiety and stress, and its associated factors among COPD patients.

1.3. Significance of the Study

COPD patients have to deal not only with the physical consequences of the disease, but they must also deal with the psychological consequences of COPD. Anxiety and depression are highly prevalent co morbidities in COPD and are often untreated or undertreated in patients with COPD. In addition, stress is another mental health problem in COPD patients and as far as knowledge of researcher is concerned none of the previous studies addressed the association between depression, anxiety, and stress and COPD. This study is therefore mandatory to fill this gap. The results of this study can be used by health policy makers to design a screening program of depression, anxiety and stress to be carried out as part of the regular COPD review and to develop an intervention program with a guideline for reducing morbidity and mortality of COPD patients due to depression, anxiety, and stress. Besides, the result of this study will add new knowledge to the current scientific knowledge. Any interested organization whether governmental or nongovernmental, will use this result to plan an intervention. It will also be given to health professionals to have insight about it and to let them to consider these diseases during treatment of patients with COPD as separate treatment strategy to decrease both psychological and physical morbidity.

CHAPTER 2: LITERATURE REVIEW

2.1. Associated factors of COPD and its Comorbidity

Chronic Obstructive Pulmonary Disease (COPD) is a major cause of chronic morbidity and mortality throughout the world. Many people suffer from this disease for years and die prematurely from it or its complications (50). The most important risk factor for COPD in the developed world is cigarette smoking (51). Other factors, including occupational or environmental exposures to dusts, gasses, vapors or fumes, exposure to biomass smoke, malnutrition, early-life infections, genetic predisposition, increased airway responsiveness, and asthma are also important in some individuals (5,52–56).

The role of genetics beyond the well-established α1antitrypsin deficiency is a subject of extensive research (57). Aging itself is also a risk factor for COPD (1).

COPD is a multisystem disorder with various co morbidities, like cardiovascular disease and cancer (58). In a nationally representative sample of 11147 million hospitalizations in USA from 1979 to 2001, having a diagnosis of COPD was associated with higher age-adjusted in-hospital mortality due to different comorbidities when compared with patients who were discharged with different comorbidities but did not have a diagnosis of COPD (59). In addition to these comorbidities, psychological distress and adversities are also common and they are more prevalent in COPD patients than other chronic illnesses (60). Two of the most common and least-treated comorbidities of COPD are anxiety and depression (61). Depression and anxiety were four to five times more prevalent in a study of 114 patients with COPD compared with matched control subjects, with a corresponding greater effect in women with COPD (62). In A study conducted in Philippines, the top five co-morbidities of COPD were hypertension, the most common co-morbidity, followed by anxiety and depression and less common co-morbidities; pulmonary tuberculosis (7.84%), malignancy (5.88%) and cerebrovascular disease (4.41%) (63).

2.2. Pathophysiological Mechanisms for Depression, Anxiety, and Stress in COPD

The mechanism of association between depression, anxiety and stress and COPD is not fully understood; however the relationship is complex and interactive. The most important risk factor for COPD is smoking. Smoking and depression have a bidirectional interaction. Depressed individuals are more likely to smoke. Conversely, smokers are more likely to be depressed (64) which could be caused by direct inflammatory effects of smoking (65).

Although smoking could have some part to play as a causative factor for depression, depression is still more prevalent among COPD patients than smokers without COPD (9). A recent systematic review and meta-analysis of 25 studies with long-term follow-up revealed that depression may be both a cause and a consequence of COPD. Smoking increases the risk and severity of COPD and increases the risk of depression or anxiety in patients with COPD (66).

It has been speculated that systemic inflammation may play a role in the presence of depression (67). A possible mechanism could be related with 'overspill' of local lung inflammation in the circulation. It is not clear if the presence of systemic inflammation has a causative association with depression or that it is a marker a specific COPD phenotype (68). Depressive symptoms are associated with dysfunction of HPA axis and inflammatory factors. Pro- inflammatory cytokines such as interleukin (IL)-1, IL-6 and tumor necrosis factor alpha (TNF-α) in serum and sputum are elevated in the group patients with depression only, and those patients were also affected by HPA axis (69). It is also well known that COPD is characterized by a systemic inflammatory response involving these pro-inflammatory cytokines (70). Importantly, these cytokines cause the activation of the HPA axis and high cortisol level (69). At the same time these excess level of pro-inflammatory cytokines cause glucocorticoid receptor resistance and absence of negative feedback resulting excess and prolonged production of cortisol, which cause damage to neurons of amygdala and hippocampus resulting in alteration of mood and pleasure (71). In addition, cortisol and these inflammatory cytokines, including TNF-α activates certain enzymes that degrade tryptophan and leads to a decrease in production of serotonin causing development of depression (72)**.** In a recent study of a population sample of older adults, elevated levels of the inflammatory biomarkers interleukin-6 and C-reactive protein accounted in part for the association of depressive symptoms with pulmonary obstruction (73). Hypoxia is an additional factor that may play a role in the development of depression in COPD. Low arterial oxygen saturation has been shown to be associated with white matter lesions (74), which are present in patients with depression (75). Breathlessness was identified as the most troublesome symptom leading to anxiety, panic and fear. Depression and anxiety may lead to fear, panic and hopelessness, low self-esteem, social isolation and dependence on caregivers, thereby initiating a vicious circle that perpetuates anxiety and depression (76).

Although smoking, inflammation and hypoxia have potential impact on the prevalence of depression in COPD, the strongest predictors of depression among patients with COPD are their severity of symptoms and reported quality of life. Need of assistance for performing daily activities among COPD patients has also been shown to be correlated with depression (9).

Areas of the brain with intrinsic CO_2/H^+-sensitive neurons which are involved in ventilation, play role in panic behaviors. The activation of these areas may concomitantly activate a defensive behavior and precipitate a panic attack (77). Most neurobiological models for anxiety involve the limbic system and amygdala. Stimulation of these areas due to excess CO_2 and H^+ results in fear and anxiety. The sense of dyspnea also stimulates the limbic system, including the amygdala. Consequently, episodes of dyspnea could contribute to the development of anxiety in COPD patients through kindling phenomena (78).

2.3. Risk Factors and Prevalence of Depression, Anxiety and Stress as Comorbidity with COPD.

The study conducted in United Kingdom shows that, approximately 21% and 33% of the participants showed depressive- and anxious symptoms respectively. The female participants showed a slight increase in both depression and anxiety (3 and 4%) in comparison with the male population (79,80). On other study stress levels among COPD patient group during ongoing treatment for exacerbation was high (81). American Psychological Associations (2012) report shows that women are often better at demonstrating symptoms of stress than men, and also report higher levels of stress (82) .

The prevalence of depressive and anxiety symptoms were significantly higher (3.5 times more higher) among severe and very severe COPD patients than the controls (60). In a follow-up study, nine months after hospitalization indicated that the patients had decreased levels of stress, indicating that hospitalization in the first survey was the cause of the stress (44). On the other hand another study showed that history of admission to the emergency room was not correlated with depression or anxiety (79). In a study conducted in Portugal, symptoms of anxiety and depression were more frequent in female patients. Those with no education completed were associated with more frequent symptoms of depression (83). In another study conducted in Philippines, the prevalence of anxiety and depression among COPD patients was 45% and 24.29% respectively (63).

In 2011, in a study conducted in Turkey on 60 patients, the prevalence of depression and anxiety among COPD patient was shown to be 46.7% and 41.7 % respectively. It was seen that anxiety and depressive symptoms were mainly caused by dyspnea and a reduced exercise capacity (84). Depression and anxiety scores were significantly higher in very severe COPD than in moderate COPD. Moreover, anxiety score in severe COPD were significantly higher than in moderate COPD and in very severe COPD than in severe COPD. Significant negative correlations were found between depression and anxiety scores and FEV1, FVC, FEV1/FVC values (85).

In the study conducted in Egypt, the prevalence of depression was (42.5% in COPD patients and 10% in control group) followed by anxiety (22.5% in COPD group and 8% in control group). There was a significant difference in anxiety score between case and control groups. FEV1 showed a significant negative correlation with depression score. There were more anxiety symptoms in patients with severe COPD compared to other groups while patients with severe and very severe COPD had more depressive symptoms compared to other groups (38). In addition, the scores of depression and anxiety were higher in the COPD patient in comparison with the control group (79). Other study described that prevalence of depression and anxiety among COPD patients was 43% and 29% respectively. History of oxygen therapy was found to be significantly correlated with symptoms of depression and anxiety (86). A study in Japan stated that decreased FEV1 was correlated with the development of depression and anxiety among COPD patients (87). Depression and anxiety symptoms were associated with age and increased in current cigarette smoking patients (88). But other study stated that age was not associated with depression and anxiety score (89). In addition other studies stated that age, sex and occupation has no correlation with depression and anxiety symptoms in COPD patients (90,91). Increased frequency of depressive and anxious symptoms was correlated with increased disease severity. In the same study, lower household income and history of cigarette smoking were found to be risk for clinically relevant depressive and anxious symptoms (92).

In Ethiopia the prevalence of depressive episode in the general population was 9.1%. In the same study, educational status and number of diagnosed chronic non communicable diseases were associated with depression (93). In across sectional study conducted in 2013 in Gondar University Hospital, patients who had history of previous admission and Hospital stays of more than one week were more likely to have common mental disorders than those who

hadn't history of admission and had history hospital stays of less than one week respectively. Those patients who were illiterate were more likely to have common mental disorders than patients learned primary school (39). In another study conducted in Mekele, the prevalence of depression among 280 patients admitted to governmental hospitals was 57.9%. Educational status and ward admission were found to be significantly associated with depression (94).

2.4. DAS and Substance Use

Use of substances such as alcohol, khat (*Catha edulis)* and tobacco has become one of the rising major public health and socio-economic problems worldwide (32). Khat contains psychoactive chemicals cathinone that activate the release of monoaminergic neurotransmitters resulting in relief of depression and feeling of happiness but up on cessation of khat chewing, there will be a decrease in neurotransmitters which leads to depression (95). In a study done in Jimma, chat chewers were 10 times more risk to develop depression than non-chewers (96). Cigarette is another substance that may be used as self-medicating method of coping up stress (97). However, instead of helping people to relax, smoking actually increases anxiety and tension (98). This might be due to free radicals that indirectly results in deficit in both tryptophan and serotonin, which has been associated with increased depressive and anxiety symptoms (99). Furthermore; tobacco use is associated with increased risk of major depression (100) and smoking rates among adults with depression were twice as high as among adults without depression (101). In a study conducted in Wolaita Sodo the prevalence of substance (khat, cigarette & alcohol) use was 7.2 % and it was significantly associated with anxiety (31). Cigarette smoke contains nicotine which stimulates monoamine-releasing neurons via activation of pre-synaptic nicotinic acetylcholine receptors (nAChRs) (102). Nicotine increase level of dopamine in the nucleus accumbens (103). In addition certain tobacco constituents have been proposed as inhibitors of the MAO enzyme and consequently result in an increased level of monoamines which are important for pleasure and happiness (103). Numerous studies have found that smoking significantly increases the risk of depression (100) and current smokers were more likely to be depressed than former or never smokers (104). In another study conducted in Gondar shows that having history of life time tobacco use and life time alcohol use was associated with higher prevalence of common mental disorders (39).

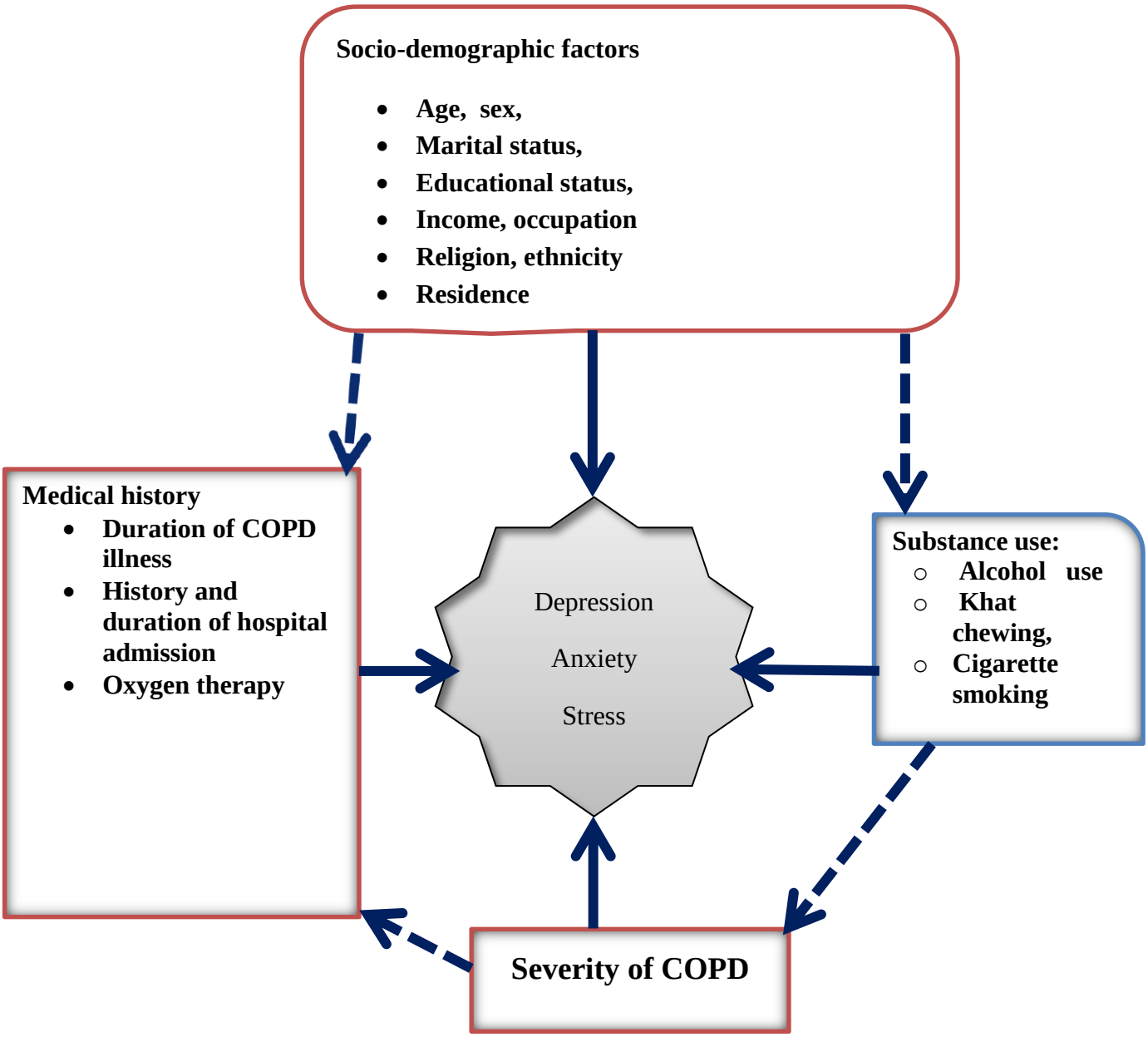

Figure 1: Schematic diagram of conceptual framework showing potential risk factors of depression, anxiety and stress.

CHAPTER 3: OBJECTIVES

3.1. General Objective

- The aim of the present study was to determine the magnitude of Depression, Anxiety and Stress and associated factors among Chronic Obstructive Pulmonary disease patients in Jimma, South West Ethiopia, 2016.

3.2. Specific Objectives

1. To determine the prevalence of DAS among COPD patients.
2. To describe the correlation between the severity of DAS with the severity of COPD.
3. To measure association between DAS and socio-demographic variables among COPD patients.
4. To determine the association between medical history and DAS among COPD patients.
5. To determine the association between substance use and DAS among COPD patients.

CHAPTER 4: RESEARCH METHODS

4.1. Study Area and Period

The study was conducted at Jimma University Specialized Hospital from March 01 to April 30/2016. JUSH is one of the oldest public hospitals in the country, located in Jimma 352 km South West of Addis Ababa. It is the only teaching and referral hospital in the Southwestern part of the country, providing services for approximately 15,000 inpatient, 160,000 outpatient attendants, 11,000 emergency cases and 4500 deliveries in a year coming to the hospital from the catchment population of about 15 million people (105). In addition to this it provides training for medical and health sciences students to create competent professionals.

4.2. Study Design

An institutional based comparative cross sectional study was conducted.

4.3. Source Population

All COPD patients attending JUSH were source of population. The control groups were healthy subjects over all in the hospital.

4.4. Study Population

COPD patients attending chest clinic at the time of data collection were the study population. For controls, healthy subjects over all in the hospital with matched sex and age characteristics that came at the time of data collection were the study population.

4.5. Eligibility Criteria

4.5.1 Inclusion criteria

- Patients that had been diagnosed with COPD.
- For controls, relatively healthy individuals who were free from any acute or chronic illness with matched age and sex.

4.5.2. Exclusion criteria

- COPD Patients With
- Other chest diseases like pulmonary tuberculosis.
- Established diagnosis of chronic medical disorder as
- Diabetes mellitus, hypertension and congestive heart failure

- Patient who were severely ill to participate were excluded.

For controls

- Attendants of critically ill patients were excluded.

4.6. Sample Size Determination

Sample size was determined by using, Epi-info version -7 program that used a double proportion formula with an assumption of 95% confidence interval and power of 80%. P_1 (29%) and P_2 (8%) values were taken from a research conducted in Egypt in 2014 (38,86). Ratio of case to control was assumed to be one. Finally the sample size calculated was 62 in each and when 5 % non- response was added it became 65. So the total sample size for this study was 130. $n = \frac{(r+1)(Z\alpha/2+Z\beta)2\ p(1-p)}{r(p1-p2)2}$

While

n = Sample size in each group

P_1= the prevalence of anxiety among COPD patients.

P_2=the prevalence of anxiety among healthy individuals.

β = 1- Power (the probability that if the two proportions differ the test will produce a significant difference)

Z= standard normal variate for level of significance

P_1-p_2= effect size

P= pooled proportion i.e. average proportion (p1+p2)/2

r=ratio of number of participants of cases to controls (1 in this case)

4.7. Sampling Procedure

This study used a consecutive sampling method; all COPD patients availed at the time of data collection that met the inclusion criteria offered to participate. For controls convenient sampling method were used and anyone who was relatively healthy and free from any acute or chronic illness with matched age (±2years) and sex characteristics were recruited. They were selected from the visitors of patients coming to the JUSH in all departments.

4.8. Data Collection Procedures

Data was collected using structured interviewer administered questionnaire. Four data collectors (BSc nurses; 2 from chest clinic and other 2 from psychiatry) were recruited.

Initially socio-demographic information and medical history were taken. Following this, Spirometric assessment (using digital spirometer: 67085) was done by trained professionals. Sixty five healthy subjects with matched age and sex characteristics were recruited as a control group. All candidates were subjected to an adopted DASS 21 questionnaire. Symptoms of depression, anxiety and stress in all candidates were assessed by an adopted Lovibond's short version of the Depression Anxiety Stress Scale (DASS). This Scale 21 (DASS 21) had been validated as a reliable self-administered psychological instrument consisting of 21 items in three domains (106). Each domain comprises seven items assessing three dimensions of mental health symptoms: depression, anxiety and stress. Respondents were asked to indicate the presence of these symptom(s) over the last one week on a 4-point Likert scale scoring from 0 to 3. (0: did not apply at all over the last week, 1: applied to some degree, or some of the time; 2: applied a considerable degree, or a good part of time; 3: applied very much or most of the time). The results were summed up and categorized as "normal", "mild", "moderate", "severe" and "extremely severe", according to the DASS manual. Finally, the last part of the questionnaire which was about history of substance use in their life time and current use was filled.

4.9. Study variables

Dependent variable

- ✓ Depression anxiety and stress

Independent variables

- ➢ COPD
- ➢ Socio demographic characteristics:
  - o Age, sex, marital status, educational status, income, occupation, religion**,** ethnicity residence.
- ➢ Substance use : alcohol consumption, khat chewing, smoking cigarette
- ➢ Medical history

4.10. Operational Definitions

Substance use: Use of at least one of the substances (alcohol, khat, cigarettes,) in an individual's life time to alter mood or behavior.

Current user: A person who consumed any substance at least once in the past 30 days.

Life time use: Referred to as use of any of the substances at least once in an individual's life time.

DAS scale

Depression

Mild= score of 10-13**, Moderate**=14-20**, severe**=21-27**, extremely severe**=28+.

Anxiety

Mild= score of 8-9**, Moderate**=10-14, **severe**=15-19, **extremely severe**=20+.

Stress

Mild= score of 15-18**, Moderate**=19-25**, severe**=26-35, **extremely severe**=34+.

4.11. Data Processing and Analysis

The data were checked for completeness and entered in to Epi-Data version 3.1 and were exported to SPSS version 20. Continuous variables were expressed as mean and standard deviation. Categorical variables were expressed as frequencies and percent. Independent sample t-test and one way ANOVA test were used to assess the statistical significance of the mean difference between two and more than two groups respectively. Chi Square (X^2) and Fisher's exact test were used to compare the COPD and healthy groups. Pearson's correlation was used to assess the correlation between two continuous variables. Preliminary assessment was done and it showed that there were no violation of assumption of normality, linearity and homoscedasticity. Simple and multiple linear regression analysis were performed to identify significant predictors of depression, anxiety and stress after controlling for other independent variables. First variables were entered in to the simple linear regression model. The variables found to be significantly associated with the dependent variables were entered into multiple linear regression with enter method. The assumptions in multiple linear regression (linearity, normality and multicollinearity) were checked. A significance level of $p < 0.05$ was used in all tests. All statistical procedures were carried out using SPSS version 20.

4.12. Data Quality Management

To assure the data quality high emphasis were given in designing data collection instrument especially regarding calibration of the spirometer and quality of socio-demographic, medical history, substance use and DASS tool. The questionnaire was translated to Amharic and retranslated back by another person. Before starting the actual survey, the questionnaire was

pre-tested on 6 individuals (3 COPD patients from chest clinic and 3 healthy individuals) who were not included in the study and interview was conducted with great privacy. Training was given to the data collectors and supervisor. They were supervised at each time throughout the course of the data collection. Regular meetings on a daily basis were held among the data collectors, supervisor and the principal investigator in order to solve problematic issues arising during data collection. The collected data were reviewed and checked for completeness and consistency before data entry.

4.13. Ethical Consideration

Ethical clearance was obtained from institutional review board of College of Health Science, Jimma University. Permission letter was obtained from JUSH clinical director office .Then the patients and selected controls were informed about the purpose of the study, the importance of their participation, possibility of withdraw at any time and written consent were obtained prior to data collection. Privacy and confidentiality of information given by each respondent were kept properly and names were not recorded.

4.14. Dissemination Plan

The results of the study will be presented to Jimma University, College of Health Sciences, and Department of Biomedical Sciences as part of degree of master in Medical Physiology thesis and will be submitted to Jimma University Post Graduate School. It will also get shared to JUSH chest clinic, hospital medical director, ministry of health, oromia regional health bureau and Jimma health office. Efforts will be made to present the results on scientific conferences and to publish it in high impact reputable journal.

CHAPTER 5: RESULT

5.1. Socio-demographic characteristics of respondents

The study was conducted on 130 respondents (65 COPD patients and the same number of age and sex matched healthy subjects). Thirty eight (58.5%) of patients were male with the same sex distribution for relatively healthy groups. The mean age of COPD patients and healthy groups were 55.48(SD±10.32) and 54.74(SD±10.09) respectively. Half of the patients, 31(47.7%), were Muslims while that of controls, 30 (46.2%), were Orthodox Christians. There was no statistical significant difference between COPD group and healthy groups with socio-demographic characteristics. Seventy percent (46) of patients had history of admission and the mean duration of COPD illness was 8.28 years (SD ±6.64). The mean FEV1 and FEV1% predicted of COPD patients was 1.73(SD± 0.72) and 61.3% (SD±22.63) respectively (Table 1). There was no significant difference between COPD and healthy groups with respect to substance use except that of life time cigarette smoking which was high among COPD patients ($p<0.01$). The current prevalence of khat chewing, alcohol use and cigarette smoking among COPD patients was 14 (21.5%), 10(15.4%) and 5(7.7%) respectively (Table 2).

Table 1: Frequency distribution of socio-demographic and clinical characteristics of COPD patients and healthy group at JUSH, Jimma, Ethiopia, April 2016

Variable		Study groups (n=130)				X^2/t	p-value
		COPD group (n=65)		Controls group (n=65)			
		N	%	N	%		
Sex	Male	38	58.5	38	58.5	0.00	1
	Female	27	41.5	27	41.5%		
Age*		55.48	10.322	54.74	10.095	-0.412 t	0.681
Religion	Muslim	31	47.7%	21	32.3%	5.5**	0.197
	Orthodox	26	40.0%	30	46.2%		
	Protestant	6	2%	12	18.5		
	Catholic	1	1.5%	2	3.1		
	Others#	1	1.5%	0	0		
Ethnicity	Oromo	38	58.5%	34	52.3	6.5**	0.362
	Amhara	10	15.4%	15	15.4%		
	Tigrie	6	9.2%	3	4.6		
	Kefa	5	7.7%	2	3.10		
	Gurage	2	3.1%	5	7.7		
	Kulo	2	3.1%	5	7.7		
	Others##	2	3.1%	1	1.5		
Educational status	No education	25	38.5%	21	32.3%	1.94**	0.584
	Primary school	24	36.9%	23	35.4%		
	Secondary school	7	10.8%	6	9.2%		
	Collage and above	9	13.8%	15	23.1%		
Marital status	Married	52	80.0%	54	83.1%	1.07**	0.876
	Widowed	6	9.2%	7	10.8%		
	Single	4	6.2%	2	3.1%		
	Divorced	3	4.6%	2	3.1%		
Occupation	Governmental employee	14	21.5%	26	40.0%	3.85**	0.57
	Farmer	16	24.6%	11	16.9%		
	House wife	16	24.6%	7	10.8%		
	Private employee	7	10.8%	6	9.2%		
	Merchant	8	12.3%	13	20.0%		
	Daily laborer	4	6.2%	2	3.1%		
Residence	Urban	37	56.9%	42	56.9%	0.808	0.236
	Rural	28	43.1%	23	43.1%		
Duration of COPD *		8.28	6.64				
History of admission	Yes	46	70.8				
	No	19	29.2				
Duration of admission*		21.9	19.45				
History of O2 therapy	Yes	38	58.5				
	No	27	41.5				
FEV1*		1.73	0.72				
FEV1% predicted*		61.30%	22.63				

N=number * Continuous variables which are expressed in mean and SD, ** fishers exact test, # Adventist, ## Seltie, t, t-test

Table 2: Frequency of substance use among COPD patients and healthy individuals at JUSH, Jimma, Ethiopia, April 2016

Variable		Study groups (n=130)				X^2	p-value
		COPD group(n=65)		Healthy group (n=65)			
Life time chewing	Yes	22	33.8%	20	30.8%	0.141	0.708
	No	43	66.2%	45	69.6%		
Current khat chewing	Yes	14	63.6%	10	45.5%	1.46	0.226
	No	8	36.4%	12	54.5%		
Life time alcohol drink	Yes	21	32.3%	26	40.0%	0.533	0.465
	No	44	67.7%	39	60.0%		
Current alcohol drink	Yes	10	47.6%	16	61.5%	0.911	0.34
	No	11	52.4%	10	38.5%		
Life time cigarette smoke	Yes	18	27.7%	6	9.2%	7.358	**0.007**
	No	47	72.3%	59	90.8%		
Current smoke	Yes	5	27.8%	2	33.3%	0.067*	0.795
	No	13	72.2%	4	66.7%		

*** fishers exact test**

5.2. Prevalence of depression, anxiety and stress symptoms among COPD patients and healthy group

The prevalence of depression, anxiety and stress among COPD patients was 47.7%, 49.2% and 56.9% respectively, which was higher than that of healthy groups with prevalence of 15.4, 18.5% and 23.1% respectively. COPD patients were 5, 4.3 and 4.4 times more likely to develop depression, anxiety and stress respectively than that of controls (Table 3). A highly statistical significant difference between COPD and healthy groups regarding depression score, anxiety score, stress score, severity of depression, anxiety and severity of stress was found (p=0.001) (Table 4). The eta squared values of depression, anxiety and stress scores were 0.151, 0.188 and 0.187 respectively which were very large. This implies that 15.1%, 18.8% and 18.7% of variation in depression, anxiety and stress scores respectively between the two groups were accounted by being COPD.

Table 3: Occurrence and frequency of DAS symptoms in last one week among COPD and healthy group at JUSH, Jimma, Ethiopia, April 2016

Outcome	Population (n=130)		RR	95% CI	p-value
	COPD group(n=65) N (%)	Healthy group (n=65) N (%)			
Depression	31(47.7%)	10(15.4%)	5.015	2.184-11.514	<0.001
Anxiety	32(49.2%)	12(18.5%)	4.283	1.938-9.466	<0.001
Stress	37(56.9%)	15 (23.1%)	4.405	2.065-9.396	<0.001

RR=relative risk

Table 4: Description and comparison of DAS among COPD patients and healthy group at JUSH, Ethiopia, April 2016.

Outcome variables	Study groups (n=130)		p-value	X^2/t
	COPD group(n=65) N (%)	Healthy group(n=65) N (%)		
Depression score#	11.71 (8.73%)	5.38(6.041%)	<0.001*	-4.801t
Anxiety score#	9.32 (7.100%)	3.88(3.773%)	<0.001*	-5.400 t
Stress score#	17.72 (8.938 %)	9.54(8.203 %)	<0.001*	-5.439 t
Level of depression				
Normal	34(52%)	55(84.6%)	<0.01**	15.99
Mild	10(15.4%)	4(6.2%)		
Moderate	10(15.4%)	4(6.2%)		
Severe	7(10.8%)	1(1.5%)		
Very severe	4(6.2%)	1(1.5%)		
Level of anxiety				
Normal	33(50.8%)	53(81.5%)	<0.001**	17.44
Mild	8(12.3%)	6(9.2%)		
Moderate	11(16.9%)	5(7.7%)		
Severe	5(7.7%)	1(1.5%)		
Very severe	8(12.3%)	0(0.0%)		
Level of stress				
Normal	28(43.1%)	50(76.9%)	<0.001**	18.
Mild	10(15.4%)	4(6.2%)		
Moderate	14(21.5%)	7(10.8%)		
Severe	8(12.3%)	4(6.2%)		
Very severe	5(7.7%)	0(0.0%)		

#=Continuous variables t independent t-test , *=Independent t-test **=Fisher exact test

5.3. Correlation of socio-demographic and clinical characteristics with DAS among COPD patients

A Pearson's correlation was done and significant negative correlation was found between monthly income and, depression and stress scores (r=-0.27, r=-0.303, p<0.05, respectively). There was also strong negative correlation between FEV1 and, depression, anxiety and stress scores (r=-0.402, -0.298, and -0.39, respectively, p<0.001) (fig. 2, fig. 3) indicating that low level of FEV1 was associated with high level of DAS scores. Duration of hospital admission had a significant positive correlation with depression, anxiety and stress scores. On the other hand age and duration of COPD illness were not correlated with DAS scores (Table 5). Residence was found to be associated with only stress score (p<0.05). History of hospital

admission and oxygen therapy had also shown significant association with DAS scores. Regarding educational status, a one way ANOVA showed that there was statistically significant difference in DAS scores ($F = 4.11$, $p<0.01$; $F = 4.75$, $p<0.05$; and $F=4.85$, $p<0.05$ for depression, anxiety and stress respectively). The eta squared was large which was 0.168, 0.155 and 0.193 indicating that 16.8%, 15.5% and 19.3% of variation in depression, anxiety and stress scores respectively were accounted by educational status. Post hoc test showed that the mean depression, anxiety and stress scores for each group (G) was statistically different from each other; patients with no education (G1) were statistically different (higher scores) from those with high school (G3) and above (G4) in depression, anxiety and stress scores. As indicated by the mean scores, no education results in high DAS scores and prevalence.

Table 5: Correlations between socio-demographic and clinical characteristics, and DAS among COPD cases at JUSH, Jimma, Ethiopia, April 2016 (n=65)

Variables		Depression score	Anxiety score	Stress Score
Age	r	0.040	0.054	0.054
Monthly income	r	**-0.272***	-0.202	**-0.303***
Duration of COPD (in years)	r	-0.048	0.027	-0.101
Duration of Hospital admission (in days)	r	**0.402****	**420****	0.**344***
FEV1	r	**-0.402****	**-0.298***	**-0.396****

*** Significant at p<0.05** **** Highly significant at p<0.001**

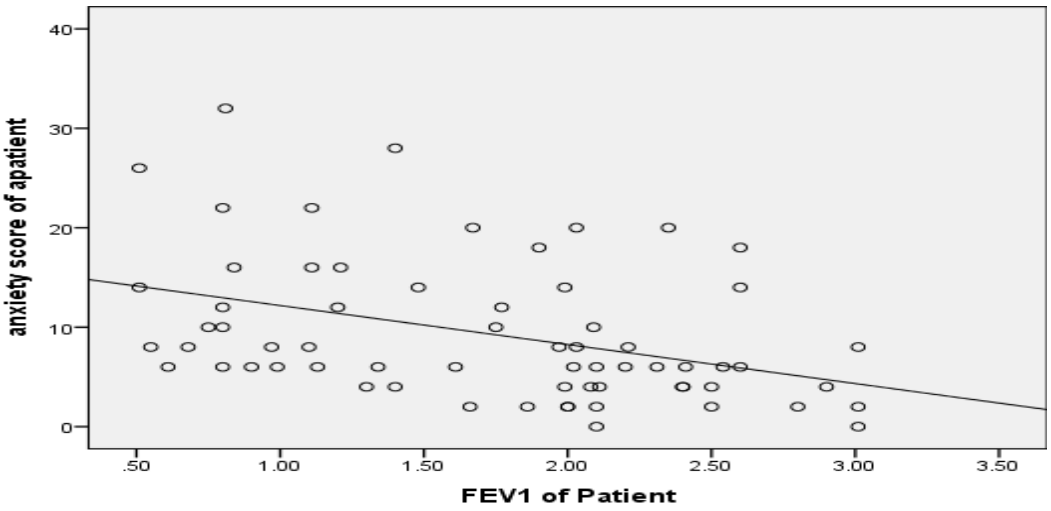

Figure 2: Correlation between FEV1 and anxiety score, JUSH, Jimma, Ethiopia, April 2016

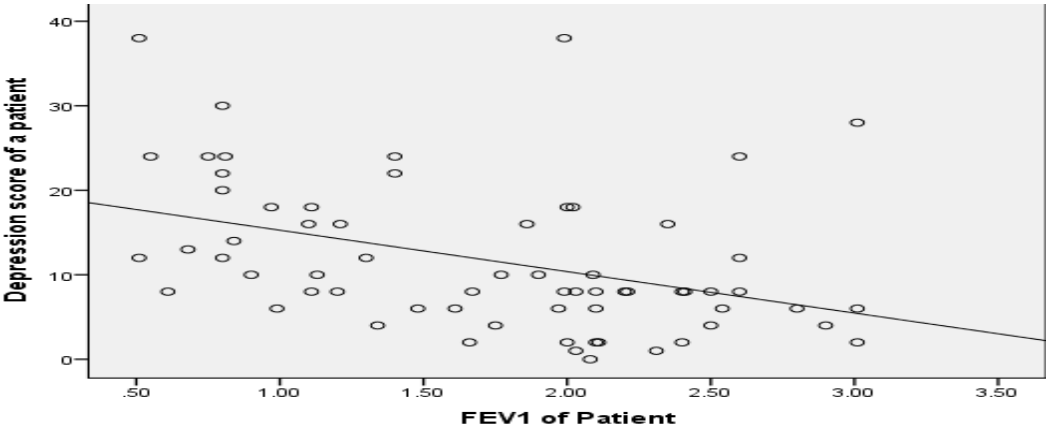

Figure 3: Correlation between FEV1 and depression score, JUSH, Jimma, Ethiopia, April 2016

Table 6: Association between socio-demographic and clinical characteristics, and DAS among COPD cases at JUSH, Jimma, Ethiopia, April 2016 (n=65)

Variables		Total(N)	Depression score Mean ±SD	Anxiety score Mean ±SD	Stress score Mean ± SD
Sex	Male	38	10.26(9.494)	8.79(6.968)	16.24(9.971)
	Female	27	13.74(7.220)	10.07(7.348)	19.81(6.884)
	P*		0.114	0.481	0.112
Marital Status	Widowed	4	17.33(11.97)	12.67(7.763)	22.00(8.944)
	Married	52	11.02(8.519)	8.58(6.241)	17.12(9.319)
	Divorced	3	16.67(8.08)	12.67(16.773)	21.33(7.024)
	Single	6	8.50(1.000)	11.50(8.699)	16.50(1.915)
	P**		0.231	0.408	0.546
Educational status					
	No education	25	14.32(8.440)	12.16(8.581)	21.52(8.027)
	Primary school	24	13.08(9.829)	9.25(5.495)	17.88(9.575)
	Secondary school	7	5.43(2.225)	5.14(1.952)	12.71(5.187)
	Collage and above	9	5.67(3.536)	4.89(5.487)	10.67(6.245)
	P**		**0.010[a]**	**0.016[b]**	**0.004[c]**
Occupation	Governmental employee	14	8.64(8.317)	6.57(5.680)	11.79(6.423)
	Private employee	7	8.43(5.940)	9.14(5.521)	17.43(7.458)
	Merchant	8	16.75(13.4)	8.25(4.590)	19.50(13.470)
	Farmer	16	10.00(6.40)	9.63(7.455)	17.75(8.606)
	House wife	16	13.44(6.83)	11.88(8.437)	21.69(7.319)
	Daily laborer	4	18.00(13.95)	10.00(10.832)	19.50(9.574)
	P**		0.116	0.503	0.074
Residence	Urban	37	10.78(9.025)	8.43(5.834)	15.62(8.139)
	Rural	28	12.93(8.335)	10.50(8.461)	20.50(9.327)
	P*		0 .331	0 .273	**0.028**
History of hospital admission					
	Yes	46	12.93(8.79)	11.22(7.272)	19.24(7.680)
	No	19	8.74(8.034)	4.74(3.956)	14.05(10.793)
	P*		0.078	**0.0001**	**0.032**
History of Oxygen therapy					
	Yes	38	14.34(9.113)	11.05(7.002)	20.29(7.990)
	No	27	8.00(6.720)	6.89(6.618)	14.11(9.091)
	P*		**0.003**	**0.019**	0.**005**

***- Independent t-test **-One way ANOVA ([a-G1 Vs G4, G1 Vs G3 , b-G1 Vs G4 ,G3 Vs G1, c- G1 Vs G4, G3 Vs G1] by post hoc test)**

5.4 Association of severity of COPD with severity of DAS among COPD patients

Severity of COPD was assessed by performing Spiro-metric measurement and looking value of FEV1% predicted to classify it in to four groups according to GOLD 2015. A one way ANOVA was conducted to evaluate the impact of severity of COPD on DAS score. The COPD group was divided in to four groups; Group1, 2, 3, 4 represented mild, moderate, severe and very severe COPD respectively. The result showed that there was a statistically significant difference in depression score for the levels of COPD groups ($F=4.3$, $p=0.008$). The effect size was large (eta squared = 0.17) which implies 17% of variation in depression score was accounted by severity of COPD. Post-hoc showed that the mean depression score for each group was statistically significant from each other, G1 (Mean (M) =8.43, SD=6.89) was statistically different from G4 (M=19.22, SD=9.18). G1 was statistically different from G3 (M=14.15, SD=8.5). Also G2 (M=10.32, SD=6.88) was statistically different from G4. As indicated by the depression mean score, severe form of COPD results in an increase in depression score. Patients with severe and very severe COPD had more depressive symptoms than other groups ($p<0.01$). There was highly significant relationship between severity of depression and stress, with severity of COPD ($p<0.001$, 0.05 respectively) (Table 7).

5.5. Predictors of depression, anxiety and stress among COPD patients

A simple linear regression revealed a significant association between depression score and the following variables: educational status, monthly income, duration of admission, history of oxygen therapy, FEV, current khat chewing and cigarette smoking. Similarly these variables except substance use had showed significant association with anxiety and stress scores. Residence was significantly associated with only stress score. Age, sex, marital status, duration of COPD and alcohol use didn't show a significant association with any of the outcome variables.

Multiple linear regression analysis was employed to determine the best linear combinations of those variables which were significant in simple linear regression model. These combinations of variables significantly predicted depression score (secondary education, college and above, duration of admission, FEV1, current khat chewing and cigarette smoking). Of these variables, educational level of college and above, duration of admission and current cigarette smoking were significant predictor of anxiety score. In addition no education and history of

hospital admission were predictors of anxiety score. No education, low monthly income, long duration of hospital admission and low FEV1 were predictors of stress score.

Patients with secondary level of education had a mean depression score of 5.43 (β=-8.447, 95 %CI (-14.83, -2.06) p<0.01). For a one day increase in duration of admission depression score was increased by 0.156 (β = 0.156, CI (0.033, 0.279), p<0.01). A one unit increase in FEV1 resulted in a decrease in depression score by 4.209 (β = -4.029, CI (-8.001,-0.417, p<0.05). Being khat chewer had resulted in an increase in depression score by 5.28 (β = 5.28, CI (1.51, 10.42), p<0.05). Similarly being cigarette smoker had resulted in an increase in depression score by 13.39 (β =13.39, CI (5.87, 20.96), p<0.01) as compared to non-smokers. No education resulted in an increase in anxiety score by 4.58(β =4.58, CI (0.399, 8.766), p<0.05) whereas college and above level of education decreased depression score by 5.15 (β=-5.15, CI (-9.95,-0.358), p <0.05). For a one day increase in duration of admission anxiety score was increased by 0.144(β=0.144, CI (0.042, 0.247), p<0.01). Similarly being cigarette smoker resulted in an increase in anxiety score by 6.75(β =6.75, CI (0.56, 12.94), p<0.05) as compared to the no smokers. No education resulted in an increase in stress score by 5(β=5.003, CI (0.7, 9.316), p<0.05). Stress score was decreased by 0.002(β=-0.002, CI (-0.003, -0.001), p<0.005) for a one unit increase in monthly income. Similarly for a unit increase in FEV1, stress score was decreased by 3 (β =-3.003, CI (-5.92, -0.085), P<0.05) (Table 9).

Table 7: Comparison between cases with different COPD severity as regards DAS at JUSH, Jimma, Ethiopia, April 2016 (n=65)

Outcomes	Mild COPD	Moderate COPD	Severe COPD	Very severe COPD	P	X^2/F
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD		
Depression score	8.43(6.889)	10.32(6.889)	14.15(8.503)	19.22(9.189)	**<0.01*[a]**	**4.13[F]**
Anxiety score	7.90(6.526)	8.45(6.646)	11.07(8.470)	12.22(7.172)	0.331*	1.16[F]
Stress score	15.33(8.132)	17.41(9.733)	18.23(8.833)	23.33(7.550)	0.163*	1.76[F]
level of depression						
Normal	16(76.2%)	13(59.1%)	4(30.8%)	1(11.1%)	**<0.001*** **	10.42
Mild	2(9.5%)	3(13.6%)	2(15.4%)	3(33.3%)		
Moderate	1(4.8%)	4(18.2%)	4(30.8%)	1(11.1%)		
Severe	1(4.8%)	1(4.5%)	2(15.4%)	3(33.3%)		
Very severe	1(4.8%)	1(4.5%)	1(7.7%)	1(11.1%)		
Level of anxiety						
Normal	14(66.7%)	11(50.0%)	6(46.2%)	2(22.2%)	0.109***	2.564
Mild	1(4.8%)	3(13.6%)	2(15.4%)	2(22.2%)		
Moderate	2(9.5%)	5(22.7%)	1(7.7%)	3(33.3%)		
Severe	2(9.5%)	1(4.5%)	2(15.4%)	0(0.0%)		
Very severe	2(9.5%)	2(9.1%)	2(15.4%)	2(22.2%)		
Level of stress						
Normal	11(52.4%)	10(45.5%)	5(38.5%)	2(22.2%)	<0.**05*****	**5.681**
Mild	5(23.8%)	4(18.2%)	1(7.7%)	0(0.0%)		
Moderate	3(14.3%)	5(22.7%)	3(23.1%)	3(33.3%)		
Severe	1(4.8%)	0(0.0%)	4(30.8%)	3(33.3%)		
Very severe	1(4.8%)	3(13.6%)	0(0.0%)	1(11.1%)		
Depression status						
Yes	5(23.8%)	9(40.9%)	4(30.8%)	8(88.9%)	**<0.01****	13.65
No	16(76.2%)	13(59.1%)	9(69.2%)	1(11.1%)		
Anxiety status						
Yes	7(33.3%)	11(50.0%)	7(53.8%)	7(77.8%)	0.167**	5.060
No	14(66.7%)	11(50.0%)	6(46.2%)	2(22.2%)		
Stress status						
Yes	10(47.6%)	12(54.5%)	8(61.5%)	7(77.8%)	0.501**	2.431
No	11(52.4%)	10(45.5%)	5(38.5%)	2(22.2%)		

***ANOVA ([a] Gr1 Vs Gr4, Gr2 Vs Gr4, Gr3 v Gr1 by Post Hoc test) ** Chi-Square test. *** Fisher's exact test. [F]=F-test value**

Table 8: A simple linear regression model showing predictors of DAS among COPD patients at JUSH, Jimma, Ethiopia, April 2016 (n=65)

variables	Depression score			Anxiety score			Stress score		
	β	Sig	95% CI	β	sig	95% CI	β	Sig	95% CI
Age	0.034	0.75	(-0.179,-0.246)	0.141	0.102	(-0.029, 0.31)	0.047	0.109	(-0.171, 0.27)
Sex Female	0.034	0.114	(-0.86, 7.81)	0.090	0.470	(-2.30, 4.86)	0.199	0.112	(-0.863, 8.02)
Educational status									
No education	4.245	0.056	(-0.110,8.600)	4.600	**0.010**	**(1.54,8.066)**	6.17	**0.006**	**(1.81,-10.489)**
Secondary	**-7.037**	**0.043**	**(-13.849,-0.23)**	-4.685	0.099	(-10.28,0.914)	-5.61	0.117	(-12.677,1.45)
College & above	**-7.012**	**0.024**	**(-13.077,-0.95)**	-5.147	**0.043**	**(-10.12,-0.18)**	-8.19	**0.010**	**-(14.32,-2.07)**
Marital status									
Single	-3.418	0.453	(-12.45,-5.62)	2.32	0.531	(-5.038,9.677)	-1.31	0.78	(-10.59,7.989)
Divorced	5.199	0.318	(-5.117,15.515)	3.505	0.408	(-4.902,11.92)	3.785	0.478	(-6.815,14.38)
widowed	6.198	0.098	(-1.176,13.572)	3.684	0.229	(-2.374, 9.74)	4.71	0.221	(-2.911,12.330
Monthly income	**-0.002**	**0.029**	**(-0.003,-0.001)**	-0.001	0.107	(-0.002,0.602)	**-0.01**	**0.014**	(**-0.03,0.005)**
Residence Rural	2.145	0.331	(2.225, 6.518)	2.068	0.248	(-1.478,5.612)	**4.88**	**0.028**	**(0.54,9.212)**
Duration of COPD	-0.063	0.707	(-0.393,0.268)	0.029	0.829	(-0.24,0.298)	-0.14	-0.422	(-0.473,0.201)
History of admission Yes	4.198	0.078	(0.481,8.877)	6.48	**0.001**	**(2.94,10.023)**	5.186	**0.032**	**(0.454,9.919)**
Duration of admission	**0.187**	**0.007**	**(0.054,0.315)**	0.159	**0.005**	**(0.052-0.265)**	0.136	**0.022**	**(0.020,0.35)**
History of O_2 therapy Yes	**6.34**	**0.003**	**(2.213,10.472)**	4.164	**0.019**	**(0.72,7.607)**	6.178	**0.005**	**(1.92,10.434)**
FEV1	**4.901**	**0.001**	**(2.091,7.711)**	3.923	**0.001**	**(1.632,6.215)**	3.722	**0.016**	**(0.72,6.72)**
Khat chew Yes	**5.289**	**0.044**	**(0.151,10.428)**	3.95	0.064	(-0.24,8.156)	1.081	0.692	(-4.34,6.5)
Alcohol drink Yes	5.3.09	0.077	(-0.588,11.207)	1.273	0.606	(-3.63,6.178)	3.4	0.272	(-2.729,9.529)
Cigarette smoke yes	**14.62**	**0.000**	**(7.302,21.931)**	**8.1**	**0.013**	**(1.764,14.43)**	8.1	0.051	(-0.028,16.22)

Male, primary education, married, urban and "no" for history of admission, history of O_2 therapy chat chewing, alcohol intake and cigarette smoking were used as reference category

Table 9: Multivariable linear regression model showing predictors of depression, anxiety and stress among COPD patients at JUSH, Jimma, Ethiopia, April 2016 (n=65)

Variables	Depression score		Anxiety score		Stress score	
	β	95% CI	β	95% CI	β	95% CI
No education	NI		4.58*	0.399, 8.766	5.003*	0.7,9.316
Secondary	-8.447**	-14.83, -2.06	NI		NI	
College & above	-7.100*	-12.99, -1.39	-5.15*	-9.95,-0.358	-5.85	-11.94, 0.24
Monthly income	-0.001	-0.002, 0.001	NI		-0.002*	-0.003, -0.001
Residence Rural	NI		NI		4.647	-0.099,8.192
History of admission						
Yes	NI		6.052*	0.52, 10.83	0.74	-5.7, 7.18
Duration of admission	0.156**	0.033, 0.279	0.144**	0.042, 0.247	0.123*	0.010, 0.236
History of O_2 therapy						
Yes	4.456	-1.96, 10.87,	3.199	-2.166, 8.57	5.041	-0.547, 10.629
FEV1	-4.209*	-8.001,-0.417	-0.043	-0.131, 0.045	-3.003*	-5.92, -0.085
Khat chewing Yes	5.28*	1.51, 10.42	NI		NI	
Cigarette smoke yes	13.39**	5.87, 20.96	6.755*	0.56, 12.94	NI	
Adjusted R^2	0.296		0.233		0.167	

***Significant (p< 0.05), **Highly significant (p < 0.01)**

The reference groups were primary education, urban and "no" for history of admission, history of O_2 therapy, chat chewing and cigarette smoking),

NI: not included in the final model.

NB: Negative values of β show that the corresponding factors are the negative predictors of depression, anxiety or stress.

CHAPTER 6: DISCUSSION

The current investigation has showed that COPD patients suffer from the disease itself and associated common mental disorders like depression, anxiety and stress. This study has provided data about the association of depression, anxiety and stress with chronic obstructive pulmonary disease in comparison with age- and sex-matched controls. The prevalence of depression, anxiety and stress among 65 COPD patients was 47.7%, 49.2% and 56.9% respectively. It was higher than that of the controls with the prevalence of 15.4%, 18.5% and 23.1% for depression, anxiety and stress respectively. This finding of depression score coincides with the study done in Egypt on 80 COPD patients; the prevalence of depression was 42.5% in COPD patients and 10% in control group followed by anxiety 22.5% in COPD group and 8% in control group. But it was not in line with the same study in aspect of anxiety score (38,79). The higher prevalence of anxiety in this study may be due to the difference in tool. The study was also more or less in line with another study done in china (86). The slight difference may be due to sociocultural, economic and lifestyle difference. Another study conducted in Turkey on 60 patients also agrees with the present study which showed that the prevalence of depression and anxiety among COPD patient group was 41.7 % and 46.7% respectively (84). But higher prevalence of depression was reported in a study conducted in Ethiopia; 57.9% (Mekele) and 58.6 % (Gondar) (39,90). This may be due to the difference in the study population since they were admitted unlike the study subjects in the present study, who were COPD and on outpatient follow up. In the present study COPD patients were 5, 4.3 and 4.4 times more likely to develop depression, anxiety and stress respectively than that of healthy group. This finding was in line with a study which showed that the prevalence of depressive and anxiety symptoms were significantly higher (3.5 times more higher) among COPD patients than that of the controls (60). This agrees with other study which stated that depression and anxiety were 4-5 times more prevalent in patients with COPD than matched controls (62). In the current study, a highly statistically significant difference between COPD and healthy groups regarding depression, anxiety and stress scores, and severities of depression, anxiety and stress was found. This finding was consistent with a studies in Egypt and Korea (38,79). This highly significant difference between COPD and healthy group may be due to the presence of COPD induced dyspnea and exercise limitation that lead to low self-esteem, social isolation and dependence on caregivers, which makes daily activities effortful and stressful, and increased the risk of depression and anxiety in patients with COPD.

Hypoxia due to COPD results in low arterial oxygen saturation which in turn results in periventricular white matter lesions that leads to depression (74). In addition to this, hypoxia leads to an increase in blood level of CO2 and H^+, which will activate CO_2/H^+-sensitive neurons in the ventro-lateral surface of the medulla and locus coeruleus, the primary ventilation regulation centers that play role in panic behaviors (77). Activation of these areas may concomitantly activate a defensive behavior and precipitate a panic attacks like fear and anxiety. The sense of dyspnea and excess CO_2 also stimulates the limbic system, including the amygdala, and stimulation of these areas results in fear and anxiety. Furthermore, since COPD is characterized by a systemic inflammatory response involving these pro-inflammatory cytokines (70) these cytokines cause the activation of the HPA axis which in turn results in an increased level of corticotrophin releasing hormone and high cortisol level (69). At the same time these excess level of pro-inflammatory cytokines cause glucocorticoid receptor resistance and absence of negative feedback resulting excess and prolonged production of cortisol, which cause damage to neurons of amygdala and hippocampus, important brain structures that are involved in regulation of mood and pleasure (71). In addition, cortisol and these inflammatory cytokines, including TNF-α activates the two enzymes tryptophan 2, 3 dioxygenase (TDO) and indoleamine 2, 3 dioxygenase (IDO), that degrade tryptophan, an important amino acid transported to brain for the production of serotonin. As a result there will be a decrease in production of serotonin leading to development of depression and anxiety (72)**.** These mentioned reasons and other factors sum up and result in high prevalence of DAS in COPD than healthy individuals.

Anxiety and stress scores were higher in those individuals who were illiterate than those who had educated secondary and above. This result was in line with a study in Ethiopia (39). This might be due to the difference in reasoning ability and cope up mechanisms when they face different problems. In the current study, significant negative correlation was found between monthly income and stress score. It coincides with a studies in United States and China which reported that low income was associated with higher risk of stress and depressive symptoms (82,92). This might be due to difficulty of fulfilling basic needs as a result of low income which in turn result in a decrease in quality of life that finally leads to stressful life.

In the present study, a unit increment in FEV1 had decreased depression score by 4.2 which is in line with a studies done in Egypt, Korea, Turkey and Japan (38,79,85,87). Similarly a unit increment in FEV1 had decreased stress score by 3 unites. The possible reason is that; the

decrease in FEV1 is associated with worsening of obstruction that result in breathlessness, dyspnea and hypoxia which in turn result in occurrence and worsening of depression, anxiety and stress. Anxiety score of patients with history of admission was 6 units higher than those of patients who hadn't history of admission. This finding is supported by other studies in Ethiopia and China (39,90,94). In addition duration of hospital admission was also a significant positive predictor of depression, anxiety and stress scores. A one day increase in duration of admission had increased depression, anxiety and stress scores by 0.156, 0.144 and 0.123 units respectively. This finding is more or less in line with a study which described that patients who had history of hospital stays of more than one week were associated with high risk of having depression and anxiety than those who had history hospital stays of less than one week (39). A study in Norway also showed that hospitalization was the cause of stress (44). This might be due to different environmental factors in the hospital that contributed to increased levels of stress, such as the death of a patient who they had shared a room with. In addition it might be due to fear of re-admission and other psychological problems; they assume themselves that they are severely diseased and have short life span which all results in fear, stress and anxiety. On the other hand, in a study in Korea, the history of admission to the emergency room was not correlated with depression or anxiety (79). This difference may be due to the difference in the room (ward versus emergency room) and duration of admission. As the duration of admission increased, there will be more risk of facing different problems including economic costs which in turn result in stressful life. In the current study, there was a significant correlation between history of oxygen therapy and DAS scores. A study in China agrees with the current study (86). The present study is also in line with a study (91) that has reported that oxygen therapy showed significant correlation with symptoms of depression and anxiety in COPD patients. This might be due to fear of future re therapy. On the other hand other investigators (93,94) found that oxygen therapy had no significant association with depression or anxiety scores. This difference may be due to a difference in sociocultural conditions, lifestyle, and demographic factors.

In the present study, there was no correlation between age, occupation and duration of COPD illness, and DAS scores. This was in line with previous studies (38,84). In addition there are also other studies which (89,91) stated that age, sex and occupation has no correlation with depression and anxiety symptoms in COPD patients. However, a studies in Norway and Ethiopia (81,94) reported that females were more common in having depression and/or

anxiety than males. In the present study even though the mean DAS scores was higher in females than males it was not statistically significant. This difference may be due to a small sample size and difference in study design.

The present study shows that patients with severe and very severe COPD had more depressive symptoms than other groups which is in agreement with a study in Egypt (38). In the current study, highly significant increase in severity of depression and stress was observed with an increase in severity of COPD. Another study agreed with result of this study which showed that increased severity and frequency of depressive symptoms were correlated with increased disease severity (88). Moreover the finding of this study is in agreement with a study (89) which described that patients with severe COPD had a significantly higher depression and anxiety scores than mild and moderate groups. The main reason behind is that as severity of COPD increase there will be an increase in severity of dyspnea, hypoxia, level of inflammatory markers, exercise limitation and dependency on care givers that lead to fear, terror and hopelessness thereby initiating a vicious circle that perpetuates stress, anxiety and depression.

Depression score of current khat chewer patients was 5.28 higher than those who didn't chew. This coincides with a study of depression on the general population of Jimma (96). This might be due to the effect of khat. Even though depression symptoms disappear during khat chewing they will re-occur following cessation of khat chewing because khat contains psychoactive chemicals cathinone and cathin that have amphetamine like action in the brain that activate the release of monoaminergic neurotransmitters such as dopamine in the limbic system (95), resulting in relief of depression and feeling of happiness but after cessation of khat, there will be a decrease in release of monoaminergic neurotransmitters due to disruption of stimulation, finally it will leads to depression.

Current smoking status was also found to be a strong positive predictor of depression score. This result was in line with a study which states that smoking had significantly increased the risk of major depression (100) and current smokers were more likely to be depressed than former or never smokers (104). Other studies on COPD patients (81,94) also agrees with this study, and shows that there was a significant association between current smoking and depression. It was shown that smoking and depression have a bidirectional interactions, depressed individuals are more likely to smoke. Conversely, smokers are more likely to be depressed (64). This might be due to nicotine in cigarette which stimulates monoamine-

releasing neurons via activation of pre-synaptic nicotinic acetylcholine receptors (nAChRs). These receptors are widespread in the central nervous system, and are of two general types: low-affinity (e.g. α7) and high-affinity (e.g., α4β2) nAChRs. Activation of these nAChR subtypes lead to influx of Na+ and Ca2+ into neurons, which produces neuronal membrane depolarization and neurotransmitter release (102). Majorly nicotine increase level of dopamine in the mesolimbic system, particularly in the nucleus accumbens. In addition certain tobacco constituents, but not nicotine, have been proposed as inhibitors of the monoamine oxidase (MAO) enzyme and consequently result in an increased level of monoamines like serotonin, norepinephrine and dopamine which are important for pleasure and happiness (103). But up on withdrawal the stimulation effect will decrease and the level of neurotransmitters will be low; then there will be development of symptoms of depression. In the current study, current cigarette smoking was also a significant predictor of anxiety score. This might be due to free radicals, another highly concentrated component of cigarette smoke, that stimulate production of cell mediated immune cytokines such as interferon-gamma (IFN-γ). These pro-inflammatory cytokines can influence serotonin metabolism, by activating indoleamine 2, 3-dioxygenase to oxidize it and results deficit of both tryptophan and serotonin, which has been associated with increased depressive and anxiety symptoms (99)

In this study there was no any significant association between life time substance use and DAS scores while there was association in that of current users. This might be due to absence of long term effect of substance use on mood. On the other hand, a study conducted in Gondar shows that a history of life time tobacco use and life time alcohol use was associated with higher prevalence of common mental disorders (39). This difference might be due to a difference in demographic factors, sociocultural activities, life style and study population.

6.1. Limitation of the study

The tool used for assessing DAS was screening rather than diagnosing. In addition, the small sample size allowed detecting only relatively strong associations.

CAPTER 7: CONCLUSION AND RECOMMENDATION

7.1 Conclusion

This study showed that the prevalence of depression, anxiety and stress among COPD patients were significantly higher than those of the controls. Educational status of the participants, duration of admission, the level of FEV1, current khat chewing and cigarette smoking were predictors of depression score. At the same time educational status, history of admission, duration of admission and cigarette smoking were predictors of anxiety score. Stress score was also shown to be predicted by educational status, monthly income, duration of admission and FEV1. Severity of depression and stress were correlated with severity of COPD. Age, sex, marital status, occupation, and duration of COPD illness did not correlate with depression, anxiety and stress scores. Life time chat chewing, cigarette smoking+g and alcohol intake didn't have any significant association with depression, anxiety and stress scores.

7.2. Recommendation

These findings suggested that many patients with COPD suffer from symptoms of depression, anxiety and stress. Therefore interventions are needed to decrease the morbidity and mortality of the disease and to promote health adjustment to the patients.

To Ministry of Health

- The ministry of health should design a screening program of depression, anxiety and stress to be carried out as part of the regular COPD review.
- Should develop a separate treatment strategy for DAS in COPD with a guideline.
- They should include rehabilitation programs on the treatment guideline of COPD to improve the physical and psychological conditions of patients with COPD.

To Jimma University Specialized Hospital

- Appropriate intervention, like medical treatment, should be given by the concerned body.
- Psychosocial care should be integrated to the current medical car for COPD patients.
- Health professionals should consider and treat these diseases concomitantly with COPD.

To future researchers

- Large scale study is recommended to determine the impact of depression, anxiety and stress on quality of life of COPD patients.

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ANNEXES

Annex I: Consent form

Good morning/afternoon.

I am ---------- a data collector, for studying symptoms of DAS on COPD patients by asking and making different investigation for you. The result of this study will help to develop a better service to timely treat DAS in COPD patients in this clinic, JUSH chest clinic and medical ward, and at the country in large by working with the hospital medical director, ministry of health, and other responsible bodies. I would be very much glad if you would take the time to answer this questionnaire concerning your health related conditions. It will take about 5 minutes to complete the form. I would like to point out that participation is entirely voluntary; all information collected will be treated confidentially. You can interrupt your participation at any time, no questions will be asked. If you agree to be, we can proceed.

Thank you once again for your participation

If you have any questions, please do not hesitate to contact me personally or by mail

Yonasakalu21@gmail.com or with a cell phone +251918318230

Statement of consent by the patient

The purposes of this study, procedure, study benefits and my rights have been fully explained to me. I hereby give my written consent to allow myself to participate in the study.

Signature of person administering consent_____

Date_____

Client's Signature_____ Date_____

Annex II. English version questionnaire

Depression, anxiety and stress among patients with Chronic Obstructive Pulmonary Disease Questionnaire.

Section I. Socio-demographic Characteristics

This section asks your personal information. Please answer every question accordingly.

101. Gender

0. Male…….. 1. Female ……

102. Age …….. Years old

103. Marital status

0. Single 1.Married 2.Divorced 3.Widowed

104. Educational level

0. No education 1.Primary school 2.Secondary school

3. Collage and above

105. Occupation

0. Governmental employee 1.Private employee 2.Merchant 3.Farmer

4. House wife 5. Daily laborer 6.Other ……

106. Monthly income……Birr).

107. Residence

0. Urban 1. Rural

108. Religion

0. Orthodox 1. Muslim 2. Protestant 3. Catholic 4. Others (specify)_____

109. Ethnicity

0. Oromo 1. Amhara 2. Tegrie 3. Gurage 4.kefa 5.kulo 6. Others (specify)___

Section II. Medical History (for only cases)

201 . Duration of COPD illness……years

202. History of hospital admission 0.yes 1. No

203. If yes for Q.202, for how long…….Days

204. Previous history of ICU admission. 0. Yes 1.No

205. History of Oxygen therapy 0. Yes 1.No

206. Difficulty in falling asleep 0. Yes 1.No

207. Need for assistance for performing daily activities

(Greater limitation of activities resulting from breathlessness)

0. Yes 1.No

Section III. Spiro metric result

301. FEV1_____

302. FVC_____

303. FEV1/FVC_____

304. FEV1%Predicted_____

Section IV. DAS Questionnaire

Please hear me when I read each statement and tell me a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There is no right or wrong answer. The rating scale is as follows: Hear me

0 Did not apply to me at all - NEVER

1 Applied to me to some degree, or some of the time – SOMETIMES

2 Applied to me to a considerable degree, or a good part of time – OFTEN

3 Applied to me very much, or most of the time - ALMOST ALWAYs

		N	S	O	AA	D	A	S
1	I found it hard to wind down	0	1	2	3			
2	I was aware of dryness of my mouth	0	1	2	3			
3	I couldn't seem to experience any positive feeling at all	0	1	2	3			
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3			
5	I found it difficult to work up the initiative to do things	0	1	2	3			
6	I tended to over-react to situations	0	1	2	3			
7	I experienced trembling (eg, in the hands)	0	1	2	3			
8	I felt that I was using a lot of nervous energy	0	1	2	3			
9	I was worried about situations in which I might panic and make a fool of myself							
10	I felt that I had nothing to look forward to	0	1	2	3			
11	I found myself getting agitated	0	1	2	3			
12	I found it difficult to relax	0	1	2	3			
13	I felt down-hearted and blue	0	1	2	3			
14	I was intolerant of anything that kept me from getting on with what I	0	1	2	3			

	was Doing							
15	I felt I was close to panic	0	1	2	3			
16	I was unable to become enthusiastic about anything	0	1	2	3			
17	I felt I wasn't worth much as a person	0	1	2	3			
18	I felt that I was rather touchy	0	1	2	3			
19	I was aware of the action of my heart in the absence of physical exertion (e g, sense of heart rate increase, heart missing a beat)	0	1	2	3			
20	I felt scared without any good reason	0	1	2	3			
21	I felt that life was meaningless	0	1	2	3			
TOTAL								

Section V; Substance Use

S/N	Type of question	Answer
501	Have you ever chewed khat in your life time?	0. Yes 1. No
502	If yes to Q501, for how long have you chewed khat?	_____year_____ months
503	If yes to Q501, are you currently chewing khat? (within the last 30days)	0. Yes 1. No
504	If yes to Q503, how often you chew khat? Specify (daily, weekly, occasionally, other)	_____
505	If yes to Q503, what amount of khat you chew per day?(in grams)	_____grams
506	Have you ever drunk alcohol in your life time?	0. Yes 1. No
507	If yes to Q506, for how long have you been drinking alcohol?	_____years_____ months
508	If yes to Q506, have you drink alcohol within the last 30days?	0. Yes 1.No
509	If yes to Q508, what type of alcohol do you drink? Specify	_____
510	If yes to Q508, how much liter of (bottle for beer, cup for caticala, tin for Tel,) alcohol you drink per week? Specify	_____
511	Have you ever smoked cigarette in your life time?	0. Yes 1. No
512	If yes to Q511, have you smoked within the last 30days?	0. Yes 1.No
513	If yes to Q512, how many cigarettes you smoke daily (in pcs)	_____

ANNEX III. የፈቃደኝነት ውል

ጅማ ዩኒቨርሲቲ

ጤና ሳይንስ ኮሌጅ

ባዮሜዲካል ትምርት ክፍል(ፊዚዮሎጅ)

ጤና ይስጥልኝ፡፡ እኔ ----------እባላለሁ፤ በጅማ ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ የድህረ ምረቃ ተማሪ በሆነው አቶ ዮናስ አካሉ ለሚሰራው ጥናት መረጃ ሰብሳቢ ነኝ፡፡ ጥናቱም የመንፈስ ጭንቀት፣ ጭንቀት እና ውጥረት ሥር የሰደደ የሳንባ በሽታ ባለባቸው ሰዎች ያለውን ስርጭት እና የሚያባብሱ ሁኔታወች የሚያጠና ነው ፡፡ የጥናቱ ዋና አላማም ይህንኑ መሰረታዊ መረጃ ለማግኘት ነው፡፡ በእርግጠኝነት ስምዎት በመጠይቁ ውስጥ የማይካተት ሲሆን የሚሰጡትም ምላሽ በሚስጠር ይያዛል፡፡ በጥናቱ ለመሳተፍ አይገደዱም፤ በማንኛውም ጊዜ መጠይቁን ማቋረጥ ይችላሉ፡፡ ግን የሚሰጡን መረጃ በዚሁ ክሊኒክ ለሚያገኙት አገልግሎት መሻሻል ወሳኝ ከመሆኑም በላይ የበሽታውን ስርጭት ለመከላከልና ለመተግበር የተሻለ እስትራቴጂ ለመቅረፅ የረዳል፡፡ ስልዚህ እባክዎትን ትክክለኛውን መረጃ ከመስጠት ኣይቆጠቡ፡፡ መጠይቆቹ ከ 5 ደቂቃዎች በላይ አይወስዱም፡፡ በማንኛዉም ጊዜ ማብራሪያ መጠየቅ ይችላሉ፡፡ በጥናቱ ለመሳተፍ ይስማማሉ

ሀ. እስማማለሁ ለ. አልስማማም

መልስዎ ለመሆን እስማማለሁ ከሆነ, እኛም መቀጠል እንችላለን.

ለተሳትፎ ፈቃደኝነወት ከልብ እናመሰግናለን

ማንኛውም ዓይነት ጥያቄ ካልዎት, በግል ወይም በደብዳቤ በሚቅጥለው አድራሻ ለማነጋገር አያመንቱ

Yonasakalu21@gmail.com ወይም በሞባይል ስልክ +251918318230

የተሳታፊው ስምምነት መግለጫ

የዚህ ጥናት ዓላማ, ሂደት እና ጥቅም ግለጽ ስልሆነልኝ እንዲሁም የእኔን መብት ሙሉ በሙሉ የጠበቀ እና ለሀገር ጠቃሚ ሆኖ ስላገኘሁት በጥናቱ ላይ ለመሳተፍ ፈቃደኝቴን በፊርማየ እገልጻለሁ

የደንበኛው ፊርማ _____ ቀን _____

የመረጃ ሰብሳቢው ስም፡----------ፊርማ----------ቀን----------

Annex IV. አማርኛ መጠይቅ

የጥናቱ ተሳታፊ መለያ ቁጥር ------

ክፍል **I.** ማህበራዊና ስነ ህዝባዊ ሁኔታን የሚመለከቱ ጥያቄዎች

S/N	ጥያቄዎች	**ምላሾች**
101	እድሜ	_____ዓመት
102	ፆታ	0. ወንድ 1. ሴት
103	ሃይማኖትዎ	0. ኦርቶዶክስ 1.ሙስሊም 2.ፕሮቴስታንት 3. ካቶሊክ 4. ሌላ ከሆነ ጥቀስ.....
104	ብሄር	0. ኦሮሞ 2. አማራ 3. ትግሬ 4. ጉራጌ 5. ከፋ 6 ኩሎ 7. ሌላ ከሆነ ጥቀስ-------
105	የትምህርት ደረጃ	0. ያልተማረ/ች 1.የመጀመሪያ ደረጃ(≤8)2. ሁለተኛ ደረጃ(9-12) 3. ኮሌጅ ወይም ዩኒቨርሲቲ
106	የጋብቻዎ ሁኔታ	1. ያላገባ/ች 2. ያገባ/ች 3. አግብቶ/ታ የፈታ/ች 4. የትዳር አጋር በሞት ያጣ/ች
107	ስራ	0. የመንግስት ሰራተኛ 1.የግል ተቀጣሪ 2. ነጋዴ 3. አርሶ አደር 4. የቤት እመቤት 5. የቀን ሰራተኛ 6.ሌላ ካሆነ ይጥቀሱ .....
108	ወርሃዊ ገቢዎ ምን ያህል ነው?	_____ ብር
109	በቋሚነት የሚኖሩበት ቦታ የት ነው?	0. ከተማ 1. ገጠር

ክፍል 2 የህክምና ታሪክ(ለሲኦፒዲ ህመምተኞች ብቻ)

203. ስር የሰደደ የሳንባ ህመሙ ምን ያክል ጊዜ ሆነው .....አመት

204.ተኝተው (ሆስፒታል ውስጥ አልጋ ይዘው) ታክመው ያውቃሉ 0.አዎ 1.የለም

203. አዎ ከሆነ መልስው ለጥ. ቁ.202, ለ ምን ያክል ጊዜ ተኙ .....ቀን

204. በጸና የታመሙ ሰወች ከሚታከሙበት(ICU) ክፍል ገብተው ታክመው ያውቃሉ. 0. አዎ 1.የለም

205. በመሳሪያ የታገዘ አየር ተሰጦወት ያውቃል 0. አዎ 1.የለም

206. እነቅልፍ እመቢ ይልወታል 0. አዎ 1.የለም

207. ያለ ረዳት የእለት ከእለት የቤት ውስጥ ሰራወትን መስራት ይችላሉ(ትንፋሽ ማጠሩ ስራወትን እንዳይሰሩ ከልክሎወታል)

0. መስራት አልችልም አወ ከልክሎኛል 1. መስራት እችላለሁ አልከለከለኝም

ክፍል 3. Spiro metric result

301. FEV1_____

302. FVC_____

303. FEV1 %(FEV1/ FVC) _____

304. FEV1 % PREDICTED_____

ክፍል 4. የመንፈስ ጭንቀት ፣የጭንቀት እና የውጥረት መጠይቆች

እኔ እያንዳንዱን መግለጫ ሳነብልወት በጽሞና ካዳመጣኝ በሁዋላ ያነበብኩለወት ነገሮች ባለፈው ሳምንት በ እርሰወ ላይ ምን ያህል ተግባራዊ እንደነበሩ 0፣1፣2፣3 በማለት የመለሱልኝ:: 0፣1፣2፣3 የሚለው ቁጥር የደረጃ አሰጣጥ ሚዛን ነው፤ ትርጉሙም እንደሚከተለው ነው::

0 ሁሉ በእኔ ላይ ተፈጻሚ አይሆንም ነበር - መቼም/ምንም

1 በተወሰነ ደረጃ ወይም አንዳንድጊዜ በኔ ላይ ተግባራዊ ነበር - አንዳንድ ጊዜ

2 በተደጋጋሚ ጊዜ በኔ ላይ ተግባራዊ ነበር - ዘወትር

3 እጅግ በጣም ወይም አብዛኛውን ጊዜ በኔ ላይ ተግባራዊ ነበር - ሁልጊዜ ማለት ይቻላል

		ም	አ	ዘ	ሁልጊዜ	D	A	S
1	ራሴን ማቀዝቀዝ/ማረጋጋት ያቅተኝ ነበር	0	1	2	3	■	■	
2	አፌ ይደርቅ ነበር	0	1	2	3	■		■
3	ምንም አይነት ጥሩ ስሜት የሚሰማው ሰው አልመስልም ነበር	0	1	2	3		■	■
4	መተንፈስ ይከብደኝ ነበር (ለምሳሌ ምንም አይነት እንቅስቃሴ ሳላደርግ እና ሳልሰራ ትንፋሽ ያጥረኝ እና ይፈጥን ነበር)	0	1	2	3	■		■
5	ማንኛውንም ስራ ለመስራት የተነሳሽነት ችግር ያጋጥመኝ ነበር	0	1	2	3		■	■
6	ለሁኔታወች ከመጠን በላይ የተጋነነ ምላሽ/አጸፋ እሰጥ ነበር	0	1	2	3	■	■	
7	መንቀጥቀጥ ያጋጥመኝ ነበር(ለምሳሌ እጅ ይንቀጠቀጥ ነበር)	0	1	2	3	■		■
8	ሰሜታዊ ጉልበት እንደምጠቀም ይሰማኝ ነበር	0	1	2	3	■	■	
9	ስለሚያሸብሩኝ ፣ ስልሚያስፈሩኝ እና ጅል ስለሚያስብሉኝ ነገሮች እያሰብኩ እጨነቅ ነበር	0	1	2	3	■		■
10	ለወደፊት ምንም አይነት ተስፋ አይታየኝም ነበር	0	1	2	3		■	■
11	እንዲሁ እሸበር ነበር	0	1	2	3	■	■	
12	ፈታ/ዘና/ ለማለት እቸገር ነበር	0	1	2	3	■	■	
13	እተከዝ እና አዝን ነበር	0	1	2	3		■	■
14	ላንድ ነገር እየሰራሁ የሚያቋርጠኝ ካለ መታገስ ይከብደኝ ነበር	0	1	2	3	■	■	
15	ለመሸበር ቅርብ እንደነበርኩ ይሰማኛል)	0	1	2	3	■		■
16	ምንም የሚያጓጓኝ እና የሚያስደስተኝ ነገር የለም ነበር	0	1	2	3		■	■
17	ምንም ጥቅም የሌለኝ ሰው እንደሆነኩ ይሰማኝ ነበር	0	1	2	3		■	■
18	ቁጡ እና ጸባይ የሌለው ሰው እንደሆነኩ ይሰማኝ ነበር	0	1	2	3	■	■	
19	ምንም ሳልሰራ ልቤ ስትመታ ይታወቀኝ ነበር (ለምሳሌ በፍጥነት ስትመታ ይታወቀኝ ነበር)	0	1	2	3	■		■
20	ምንም የሚያስፈራ ነገር በሌለበት እፈራ ነበር	0	1	2	3	■		■
21	ህይወት ትርጉም የለሽ እንደሆነች ይሰማኝ ነበር	0	1	2	3		■	■
TOTAL								

ክፍል 5. የአልኮሆል መጠጥ፣ ጫት መቃምና ሲጋራ ማጨስን የሚመለከቱ ጥያቄወች

501	በሂዎትዎ ጫት ቅመው ያውቃሉ	0. አዎ1. አለውቅም
502	ለጥየቄ 501መልሱ አዎ ከሆነ, ለስንት ጊዜ ቅመዋል?(በወር)	_____ዓመት_____ወር
503	ለጥየቄ 501መልሱ አዎ ከሆነ, ባለፉት 30 ቀናት ዉስጥ ቅመዋል?	0. አዎ1. የለም
504	ለጥየቄ 503 መልሱ አዎ ከሆነ, ምን የህል ጊዜ ይቅማሉ?(በየቀኑ, በሳምንት)	----------
505	ለጥየቄ 503 መልሱ አዎ ከሆነ, በቀን ምን የህል መጠን ጫት ይቅማሉ ?	_____ግራም
506	በሂዎትዎ አልኮሆል ያለበት መጠጥ ጠጥተው ያውቃሉ?	0. አዎ1. አላውቅም
507	ለጥየቄ 506 መልሱ አዎ ከሆነ, ለስንት ጊዜ አልኮሆል ተጠቅመዋል?	_____ዓመት_____ወር
508	ለጥየቄ 506 መልሱ አዎ ከሆነ,ባለፉት 30 ቀናት አልኮሆል ተጠቅመዋል?	0. አዎ 1.የለም
509	ለጥየቄ 508 መልሱ አዎ ከሆነ, ምን አይነት አልኮሆል ተጠቀሙ?(ጥቀስ)	_____
510	ለጥየቄ 508 መልሱ አዎ ከሆነ ምን ያህል አልኮሆል በሳምንት ይጠቀማሉ?	____ሊ
511	በሂዎትዎ ሲጋራ አጭሰው ያውቃሉ?	0. አዎ1. አለውቅም
512	ለጥየቄ 511 መልሱ አዎ ከሆነ, ባለፉተ 30 ቀናት አጭሰዋል?	0. አዎ 1.የለም
513	ለጥየቄ 512 መልሱ አዎ ከሆነ,በቀን ምን ያህል ሲጋራ ያጨሳሉ ?	_____

DECLARATION

I, the undersigned, declare that this thesis is my original work, has not been presented for a degree in this or any other University and that all sources of materials used for the thesis have been fully acknowledged.

Name: Yonas Akalu Getahun

signature_____

Name of the institution: Jimma University

This thesis has been submitted for examination with my approval as a University advisor.

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Sig _____date_____