Depression, Anxiety and Stress Among People Living with Chronic Hepatitis B in St. Paul's Hospital Millennium Medical College

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November, 2024

Addis Ababa, Ethiopia

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A Thesis Submitted to School of Psychology, Addis Ababa University, in Partial Fulfillment of the Requirements for the Master

of Arts Degree in Counseling Psychology

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November, 2024

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Acknowledgments

First and foremost, the completion of this thesis would not have been possible without the help of God. I would like to thank the Almighty for His countless love and blessings.

I would like to express my deep and sincere gratitude to my advisor Dr. Assefa Berihun (Phd) for his invaluable guidance throughout this research paper. It was a great privilege and honor to work under his guidance.

I am extremely grateful for my family, friends and others for their encouragement and support which helped directly and indirectly in completion of this paper. It was impossible to conduct this work without their participation.

Finally, the researcher would like to express her sincere gratitude to all research participants who allocated their time and cooperated by answering the questionnaire.

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Abstract

This study investigates depression, anxiety, and stress among individuals living with chronic Hepatitis B (CHB) and receiving follow-up care at St. Paul's Millennium Medical College, aiming to assess the associations between socio-demographic factors and these mental health outcomes and identify potential predictors of each condition. An institutional-based cross-sectional design was employed, using a quantitative approach to gather data from a sample of 262 individuals with CHB. The Depression, Anxiety, and Stress Scale (DASS-21) was administered to evaluate participants' emotional states, and both stratified and simple random sampling methods were applied to select the study group. Descriptive statistics were calculated to establish prevalence rates, with Chi-square tests analyzing associations between socio-demographic and clinical factors (age, gender, income, education, family size, year since diagnosed, medication status and adherence) and levels of depression, anxiety, and stress. Further, binary logistic regression was used to determine the significance of socio-demographic variables in predicting these mental health outcomes. The findings revealed that 24% of participants experienced symptoms of depression, 23.6% exhibited anxiety, and 19% reported stress. Depression and anxiety were notably more prevalent among females, while stress levels were higher among participants with lower income and educational attainment. Chi-square analysis indicated that while most socio-demographic factors did not demonstrate statistically significant associations with mental health outcomes, education and income levels were associated with heightened rates of depression, anxiety, and stress. Logistic regression results indicated that income level was a significant predictor of depression, with higher-income individuals showing greater odds of depressive symptoms possibly due to the social pressures and expectations they face, which may compound feelings of isolation and stigma often experienced by CHB individuals. Additionally, lower education and income levels were significantly associated with increased stress, suggesting socio-economic factors play a crucial role in the mental health of this population. These findings emphasize the psychological burden of CHB, particularly for women and those with limited educational and financial resources, who are at higher risk of anxiety and stress. In conclusion, the study underscores the need for comprehensive mental health support tailored to the socio-economic and educational challenges faced by people with CHB. Incorporating accessible counseling services, educational resources, and social support within CHB treatment programs could help alleviate the psychological strain on these patients, ultimately improving adherence to treatment and enhancing quality of life

Acronyms and Abbreviations

AAU - Addis Ababa University

ALIPB - Aklilu lemma institute of pathobiology

DAS - Depression, Anxiety and Stress

DASS - Depression, Anxiety and Stress Scale

CHB - Chronic Hepatitis B

CHBV - Chronic Hepatitis B virus

HBsAg - Hepatitis B surface Antigen

HBV - Hepatitis B virus

HCC - Hepatoellularcarcinoma

HCV - Hepatitis C virus

HRQL - Health-Related Quality of Life

SPSS - Statistical Package for Social Science

TEFL - Teaching English as a Foreign Language

WHO - World Health Organization

Chapter One - Introduction

1.1 Background

Hepatitis B Virus (HBV) remains one of the major global public health threats, affecting millions worldwide and leading to severe health complications (Su & Liu, 2017). HBV infections may be acute or chronic, with chronic hepatitis B (CHB) diagnosed when an individual has tested positive for hepatitis B surface antigen (HBsAg) for more than six months (ROPER, 1991). Those with CHB face an increased risk of serious liver-related health issues, such as cirrhosis, liver failure, and hepatocellular carcinoma (HCC), a form of liver cancer that is particularly prevalent among men in various regions, including sub-Saharan Africa (Beasley, 1988).

The impact of HBV is significant, with the World Health Organization (WHO) estimating that, in 2019, approximately 1.5 million new HBV infections occurred globally. Of the 296 million individuals with chronic HBV infections that year, about 820,000 died from liver-related complications, including liver failure and HCC. The global prevalence of HBsAg, a marker of chronic HBV infection, was 3.8%, with regions like the Western Pacific show higher prevalence rates of around 6% equivalent to roughly 116 million people living with chronic HBV in that area alone (WHO, 2021). Hepatitis B virus is highly infectious, capable of spreading through horizontal or vertical transmission of infected bodily fluids, further complicates containment efforts and amplifies its impact on public health (Yazie & Tebeje, 2019).

The consequences of living with chronic HBV extend beyond physical, significantly impacting individuals' mental health and quality of life. Research indicates that people with CHB, particularly those with complications like cirrhosis, frequently experience various psychosocial challenges. Studies have found that those with chronic hepatitis B and C face heightened rates of depression, anxiety, and stress compared to the general population. Among CHB people, mental health issues may stem from social stigma, financial burdens due to ongoing treatment, and a lack of accessible psychosocial support services, especially for those in resource-limited settings (Enescu, Mitrut, Balasoiu, Turculeanu, & Enescu A., 2014).

Chronic illness in general has been shown to correlate with increased rates of depression, anxiety and stress. For instance, Clarke (2009) demonstrated that people with multiple chronic conditions are more likely to experience depression, with severity correlating with the number of chronic conditions a person has. This is supported by Ma, Ying et al. (2021), who found that chronic diseases such as HBV often led to emotional distress, compounded by symptoms like chronic pain and functional limitations, which are partially mediated by the individual’s level of pain. This association is particularly notable in specific demographics: females, those with less education, people living in rural areas, and individuals over 45 years of age are more likely to experience depression (Ma, Ying et al., 2021).

The mental health challenges associated with CHB are further intensified by stress, which can result from the nature of chronic illnesses, long-term disease prognosis, and economic strain due to costly treatments (Tola, Shojaeizadeh, Garmaroudi, Tol, Yekanineja, Ejeta & Kassa, 2015). Stress, when combined with chronic HBV symptoms and treatment requirements, can reduce people' adherence to medical regimens and decrease their functional quality of life, thereby creating a cycle of psychological distress that further exacerbates their physical health issues (Tola et al., 2015). Given the complexity of CHB and the enduring nature of the illness, it becomes essential to manage both the physical symptoms and the psychological distress, which requires a holistic approach to patient care.

Research on the mental health of HBV reveals that people with CHB often experience higher levels of anxiety and depression compared to the general population, with studies showing that individuals diagnosed with chronic inactive hepatitis report poorer global functioning (Enescu et al., 2014). They frequently feel hopelessness and despair, particularly within the first three months following diagnosis (Alavian, 2007). Additionally, the potential for long-term complications, coupled with the stigma associated with HBV, has been shown to affect people' perspectives on life and their outlook for the future (Hajarizadeh, Richmond, Ngo, Lucke & Wallace, 2016). People with CHB frequently have worries and fears related to hepatitis B. To provide people with CHB with comprehensive care, clinical management must take into account their demands for psychological support (Hajarizadeh et al., 2016).

Misunderstanding and a general lack of awareness about HBV often increase these psychological challenges. Many people feel that there is limited social support available to them due to the stigma and misconceptions surrounding the infection. Studies indicate that a lack of understanding about HBV transmission, management, and prognosis increases stress and tension among people, particularly when they receive inadequate information from healthcare providers during the diagnostic process (Ng, Low, Wong, Sudin & Mohamed, 2013; Valizadeh, Zmanzadeh, Negarandeh, Zamani, Hamidia & Zabihi, 2016). These people often attempt to hide their illness, exacerbating feelings of isolation and anxiety due to fears of discrimination or being associated with drug misuse (Stanaway, Flaxman, Naghavi, Fitzmaurice, Vos, Abubakar & Cooke, 2016).

The research literature to date has largely focused on the physical health consequences of HBV, with comparatively less attention on the psychosocial impacts, especially in terms of how HBV related stress, anxiety, and depression affect people' daily lives and adherence to treatment. The gap in understanding the specific psychological experiences of CHB people who face unique mental health burdens due to stigma, social isolation, and inadequate support highlights the need for further investigation. This study aims to address this gap by exploring the prevalence and levels of depression, anxiety, and stress of CHB people, providing insights that can inform targeted psychosocial interventions and support measures to improve the overall quality of life for this population.

1.2 Statement of the Problem

Chronic Hepatitis B Virus (CHBV) infection is a significant public health issue that not only affects people physically but also psychologically. Many CHB people face intense psychological challenges such as anxiety, feelings of vulnerability, and despair due to the severity and life-threatening nature of the illness. Studies indicate that depression and anxiety are significantly more prevalent among individuals with chronic HBV than in the general population (Altindag, Cadirci, & Sirmatel, 2009; Ng et al., 2013). Yet, limited research has examined the prevalence of these mental health issues specifically among CHB people in Ethiopia. Thus, understanding the prevalence of depression, anxiety, and stress among chronic hepatitis B people is crucial to addressing their overall well-being.

Ethiopia's high rate of Hepatitis B Virus infection poses a serious public health threat, with prevalence rates differing across various populations. Systematic reviews and meta-analyses estimate a national HBV prevalence of around 6% to 7.4%, with some subgroups showing even higher rates (Umer, Teklemariam, Ayele, & Mengesha, et al., 2023; Wakjira, Darega, Oljira, & Tura, 2022). Despite these statistics, little is known about the mental health status of CHB people in the country. Research from other contexts highlights a wide range of psychological symptoms associated with hepatitis infections, such as anxiety, fear, and feelings of worthlessness (Valizadeh, ZamanZadeh, Negarandeh, Zamani, Hamidia, & Zabihi, 2016). Furthermore, studies indicate that hepatitis B people

often report lower emotional health than the general population, underlining the need for targeted mental health interventions for this group (Modabbernia, Ashrafi, Malekzadeh, & Poustchi, 2013).

In addition to identifying prevalence rates, it is essential to examine how specific socio-demographic and clinical factors such as gender, age, medication follow-up status, educational level, marital status, family size, income, and the length of time since diagnosis are associated with depression, anxiety, and stress levels among CHB people. For example, prior studies have shown that psychological symptoms among CHB people are often exacerbated by factors such as social stigma, financial stress, and a lack of adequate psychosocial support, which is especially concerning in resource limited settings (Enescu, Mitrut, Balasoiu, Turculeanu, & Enescu A., 2014).

General research on chronic illness suggests that depression, anxiety, and stress are more common among those with multiple chronic conditions, with the severity of mental health issues increasing in correlation with the number of chronic conditions a patient has. For instance, Clarke & Currie (2009) found that depression rates are significantly higher among individuals with multiple chronic diseases. This association was further supported by Ma, Ying et al. (2021), who found that chronic conditions often lead to emotional distress, compounded by factors such as chronic pain and functional limitations. The study noted that certain demographics, including females, individuals with lower education levels, those residing in rural areas, and individuals over 45 years of age, are more vulnerable to depression (Ma, Ying et al., 2021).

Studies have also demonstrated that stress, exacerbated by chronic illness, impacts treatment adherence and people' overall quality of life. This is particularly relevant for CHBV people, as stress may stem from long-term disease prognosis, treatment costs, and fears surrounding social stigma, all of which have been shown to negatively impact mental health outcomes (Tola, Shojaeizadeh, Garmaroudi, Tol, Yekanineja, Ejeta, & Kassa, 2015). Additionally, other studies suggest that HBV people often experience heightened anxiety and depression following their diagnosis, with some even reporting decreased global functioning compared to the general population (Enescu et al., 2014).

Given the limited research focused on the psychological impacts of CHB on Ethiopian people, there is a clear need to investigate the prevalence and associated factors of depression, anxiety, and stress within this population. By addressing these questions, this study aims to fill a significant gap in the understanding of mental health outcomes among chronic hepatitis B people in Ethiopia, which can inform strategies for improving their quality of life through targeted psychosocial interventions.

In light of this, the study determined the prevalence, level and association of depression, anxiety, and stress among people living with chronic hepatitis B in St. Paul’s hospital millennium medical college in a longitudinal cohort research project can be considered valuable and relevant.

1.3 Research questions

The study will attempt to address the following research questions

- What is the prevalence and level of depression, anxiety, and stress of chronic Hepatitis B people at St. Paul's Hospital Millennium Medical College?
- Is there a significant association between demographic and clinical factors and depression, anxiety, and stress levels in individuals with chronic Hepatitis B?
- Do demographic and clinical factors predict depression, anxiety, and stress levels in individuals with chronic Hepatitis B?

1.4 Objective of the Study

1.4.1 General Objective of the Study

- To examine the prevalence and levels of depression, anxiety, and stress among individuals living with chronic Hepatitis B virus who are receiving follow-up care and treatment at St. Paul's Hospital Millennium Medical College.

1.4.2 Specific Objectives of the Study

- To examine the association between socio-demographic and clinical factors and levels of depression, anxiety, and stress among chronic Hepatitis B patients.

- To determine whether socio-demographic and clinical factors significantly predict depression, anxiety, and stress levels among chronic Hepatitis B patients.

1.5 Significance of the Study

This study on individuals living with chronic Hepatitis B (CHB) provides valuable insights aligned with the research objectives of examining mental health challenges in this population. Firstly, it offers clinical insights into the prevalence and levels of depression, anxiety, and stress in individuals living with CHB receiving follow-up care, enabling healthcare providers to design treatment plans that address both physical symptoms and mental health needs. Secondly, by examining the association between socio-demographic and clinical factors and mental health outcomes, the study can inform patient education, raising awareness about the potential psychological impacts of CHB and encouraging patients to seek appropriate mental health support. Thirdly, identifying psychological distress prevalence and levels will help inform the development of hospital based psychosocial support programs, improving emotional well-being management for CHB patients.

Furthermore, the study has significant policy implications, underscoring the importance of addressing mental health alongside physical health in CHB management and providing insights for policymakers to enhance integrated care models. Additionally, by determining the predictive value of socio-demographic and clinical factors for mental health outcomes, this research addresses existing gaps and encourages further exploration of mental health care integration into CHB treatment. Finally,

the study's findings will serve as a valuable resource for future researchers, contributing to the broader literature on the intersection of mental and physical health in CHB patients.

1.6 Delimitation of the Study

This research is delimited to only people with CHB who have a follow up at St. Paul's Hospital Millennium Medical College. Furthermore, this research is limited to participants who already enrolled in a longitudinal cohort study in Addis Ababa since 2015G.C. In addition, its cross-sectional design, which captures data at a single point in time and does not allow for causal inferences or long-term observations. As a result, the study is unable to examine the long-term effects of chronic Hepatitis B on mental health.

1.7 Operational Definition

Depression: is a feeling of dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia, and inertia. In this study depression is defined as measured by DASS 21 ranges which scores are "from 0–9 Normal (No depression), 10–13 Mild, 14–20 Moderate, 21–27 Severe, and 28+ Extremely Severe depression". This allows for the determination of the prevalence of and range for depression.

Anxiety: is a feeling of autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. In this study anxiety is defined as measured by DASS 21 ranges which

scores are from 0- 7 Normal (No anxiety), 8-9 Mild anxiety,10-14 Moderate anxiety, 15-19, Severe anxiety, 20+ Extremely sever anxiety". This allows for the determination of the prevalence of and range for anxiety.

Stress: is a state of difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/over-reactive, and impatience. In this study stress is defined as measured by DASS 21 the scale ranges which scores are "from 0-14 Normal (No stress), 15-18 Mild, 19-25 Moderate, 26-33 Severe, 34+ Extremely severe". This allows for the determination of the prevalence of and range for stress.

Chronic Hepatitis B: Chronic Hepatitis B virus defined as persons positive for hepatitis B surface antigen (HBsAg) for more than 6 months.

Age: The number of years from the participant's birth to the time of the survey.

Gender: The patient's identification as male or female.

Follow-up Status: Whether the participant taking medication or not taking medication while the follow-up.

Medication adherence: Whether the taking medication participants are actively and regularly taking their medication or not.

Educational Status: The highest level of formal education completed by the patient, recorded as an ordinal variable and categorized as No formal education, Primary (accomplished 1-8), Secondary (accomplished 1-8) or College and above.

Marital Status: The self-reported current marital status of the participant, categorized as Single, Married, Divorced, or Widowed.

Family members: The total number of individuals, including the participant, who reside in the same household. This is recorded as grouping Live alone, 2-5 members, and 6 and above members.

Income Status: The participant's self-reported average income level, recorded as Low, Middle, and High based on participant's income standards.

Year Since Diagnosis: The number of years the participant is aware of having had a chronic Hepatitis B diagnosis, calculated from the year of diagnosis to the time of the survey. This is recorded as 8-12 years, 13-17 years, or 18 and above years.

Chapter Two - Literature Review

The overall notion of HBV was introduced at the beginning of the literature review chapter. Following a thorough discussion of HBV theories and their practical applications, the psychological effects of HBV and its literature pertaining to hepatitis, as well as depression, anxiety, and stress, were covered in length. The study's conceptual framework was offered in the end.

2.1 Definition of Hepatitis B

Hepatitis B is a vaccine-preventable liver infection caused by the Hepatitis B virus (HBV). It was first discovered in 1965 by Baruch Blumberg. He identified a new antigen in the sera of transfused patients with hemophilia, later finding it to be the hepatitis B surface antigen (Blumberg & Alter, 1965). Thanks to technological advancements, the virus's full genome was sequenced by 1980. In 1983, a vaccination was made accessible shortly after (Halegoua-De & Hann, 2014).

The hepatitis B virus is highly infectious, spreading through both horizontal and vertical transmission, which significantly impacts public health (Yazie & Tebeje, 2019). Horizontal transmission occurs when infected bodily fluids, such as blood, saliva, or sexual fluids, are exchanged. This type of transmission can happen, for example, between individuals who share needles, engage in unprotected sex, or come into contact with an infected person’s blood. Vertical

transmission, on the other hand, takes place when the virus is passed from an infected mother to her child during childbirth. Together, these transmission methods contribute to the widespread reach and public health challenges posed by hepatitis B. (Louise & Hogh, 2012; Pondé, 2023).

Chronic hepatitis B (CHB), a severe worldwide public health concern with a high morbidity and mortality rate, is caused by the hepatitis B virus. The virus is very contagious and transmitted by contaminated body fluid vertically or horizontally. Out of an estimated 280 million people with chronic HBV infection, over 850,000 deaths in 2015 were linked to HBV-related complications such as liver cancer and cirrhosis in the year 2018 (WHO, 2018). Still, the virus is widespread around the world, with outbreaks continuing to occur in Southeast Asia, China, and much of Africa (Feldman, Friedman & Brandt, 2020). In line with WHO (2021) these areas are still developing and do not have access to as many resources such as vaccines. In sum, there are still nearly 300 million cases of HBV globally.

On the other hand, as per CDC (2023), pregnancy sharing injectable supplies, sexual contact, and other body fluids can all result in the transmission of hepatitis B. Lethargy, low appetite, nausea, vomiting, and jaundice are among the symptoms. Even while not, everyone has symptoms, some could become chronically infected and raise the risk of serious health issues including liver cancer or disease. Age determines the risk of developing chronic hepatitis B. Both temporary and persistent

infections are possible. Chronic infection that can cause liver disease or liver cancer, among other major, sometimes fatal health problems. The likelihood that hepatitis B were come chronic is influenced by age. While someone contracts the hepatitis B virus while they are younger, their chance of developing a chronic infection is increased.

2.2 Prevalence of Hepatitis B

Worldwide, the hepatitis B virus is common. The WHO reports that in 2019, there were 820,000 deaths from HBV-related liver failure, cirrhosis, or primary hepatocellular carcinoma (HCC), as well as around 1.5 million new infections and 296 million chronic HBV infections globally. The prevalence of HBsAg in the population was 3.8% worldwide. Over 800,000 people die from CHB-related causes each year in the world, including cirrhosis and liver cancer, however only 10% of cases are detected and 22% of patients receive treatment (WHO, 2017).

Earlier studies have identified a notable gender disparity in hepatitis B virus (HBV) prevalence, with males significantly more likely than females to test positive for HBsAg, a marker of HBV infection, at a ratio of seven men for every affected woman. This trend is also reflected in the progression of HBV-related conditions, where males exhibit higher rates of chronic liver disease and hepatocellular carcinoma (Lee et al., 1999; Chu et al., 1983). More recent research further supports these findings by highlighting that, females generally exhibit stronger immune responses to

viral vaccines, including those for hepatitis A and B, and lower HBsAg prevalence. An analysis of blood donors across diverse populations in Ghana, China, Gabon, and Burkina Faso confirmed this gender variation, showing lower rates of HBV infection among females. Given this reduced susceptibility, the study advocates for encouraging blood donation among women (Allain et al., 2022), underscoring how gender-based differences in HBV susceptibility and vaccine response may inform public health initiatives.

Five-point nine percent of the general population in the Western Pacific area tested positive for HBsAg, indicating a moderate prevalence of HBV. This amounts to about 116 million chronic HBV infections, 140,000 new infections, and a predicted 882,000 deaths from complications connected to HBV. Additionally, 6.6 million (5.3 million–8.3 million) individuals with a diagnosis of hepatitis B got treatment in 2019 (WHO, 2021).

According to WHO (2017), 60 million individuals in sub-Saharan Africa have chronic hepatitis B, with 4.8 million of those persons being children under five. The prevalence of HBsAg in this region is estimated to be 6.1%. According to WHO 2021, 80,000 people died and 990,000 people were newly infected with hepatitis B in the African area. According to estimates, the prevalence in the WHO's European area was 2.1%; estimates ranged from 0.01% in the UK to

10.3% in Kyrgyzstan. In several African nations, prevalence rates of 10% and more continue to exist, indicating the continued need for HBV prevention (Hwang & Cheung, 2011).

The WHO Western Pacific region has the highest frequency (6.2%), whereas the WHO African area has the highest incidence (6.1%). Both nationally and sub-nationally, these rates differ (WHO, 2017). Most CHB patients live in low- and middle-income countries (LMICs), where around 75% of infections occur. The method of transmission is exposure to infected blood or bodily fluids; in low- and middle-income countries, vertical transfer from mother to child at birth is a prominent source of infection (Cooke and others, 2019; Liu and colleagues, 2021).

As part of the African continent, Ethiopia's high rate of hepatitis B virus infection is a serious problem, which varies from area to region and even across studies conducted within a region. In 2016, the first comprehensive research and meta-analysis of viral infections in Ethiopia was carried out (Belyhun et al., 2016); Based on Girmay, Zufan & Asfaw (2011), Ethiopia is classified as having a medium to high endemic of HBV infection. However, the analysis included 60% of older papers published before 2010. This makes estimating the current pooled prevalence estimate challenging. Furthermore, because the study focused on several viral infections, a comprehensive investigation of HBV was lacking.

The prevalence of Hepatitis B Virus (HBV) in Ethiopia is a significant public health concern. Studies have shown varying prevalence rates across different populations in the country: The prevalence of hepatitis B in the general population in Ethiopia ranges from 6% to 7.4% (Umer et. al., 2023). A systematic review and meta-analysis revealed a pooled prevalence of HBV at 7.4% in Ethiopia, with varying rates among different subgroups like HIV-infected individuals, blood donors, immigrants, and others (Wakjira et al., 2022). Among pregnant mothers, the prevalence of HBV ranged from 2.40% to 8.40% in Ethiopia (Belyhun, Maier, Mulu, Diro & Liebert, 2016). In general, Ethiopia is considered to have a high burden of HBV infection, although there is a lack of comprehensive national data on the spread of the disease (Umer et al., 2023).

Now a days the Ethiopian government is emphasizing in lowering the incidence of HBV. In order to lessen this national and worldwide public health concern, it may be essential to ascertain the most recent facts regarding HBV pooled prevalence in Ethiopia while creating and executing intervention programs and (Yazie & Tebeje, 2019).

2.3 Impacts of Chronic Hepatitis B

2.3.1 Psychosocial and Emotional Impacts of Living with CHB

Living with chronic HBV has physical, social, and emotional impacts that can negatively affect patients' quality of life (Ibrahim, Umstead, Wang & Cohen, 2023). Patients may experience

symptoms like fatigue, depression, anxiety, hostility, and other psychological challenges that influence their overall well-being (Enescu et al., 2014). A study on British patients with chronic HBV found that the infection significantly affected their social, sexual, family life, physical and psychological health, and work. Most patients reported varying degrees of impact on their lives, with psychological aspects being one of the most affected (Lok, Van Leeuwen, Thomas & Sherlock, 1985).

Individuals living with HBV often experience depression, anxiety, self-isolation, and fear related to disclosure and transmission to others. The emotional impact can lead to a range of coping behaviors, from healthy lifestyle modifications to denial or drug use. Adults living with HBV face considerable psychological impacts that contribute to depression, anxiety, and self-isolation. The diagnosis of HBV can trigger emotional distress and fears related to disclosure, transmission, progression to liver cancer, and loss of vitality (Freeland, Racho, Kamischke, Moraras, Wang, Cohen & Kendrick, 2021).

The hepatitis B virus cannot be totally eradicated by the existing therapies. Because of this, the majority of patients need long-term therapy possibly lifelong (Dolman et al., 2018). According to Xu et al. (2018) for individuals with CHB, long-term oral antiviral medication may have psychological side effects. Most patients who require long-term antiviral medication have

significant financial burdens associated with it, particularly those who are financially in low income.

Due to their increased level of anxiety on the uncertain length of oral antiviral therapy and the impact of antiviral therapy on managing the course of their illness, patients may also experience psychological stress. Patients are nonetheless worried about possible side effects even though antiviral medications are typically safe and well-tolerated by patients. Additionally, patients' social activities may be reduced by misconceptions about the contagiousness of CHB and social prejudice (Modabbernia et al., 2013).

2.3.2 Psycho-Social Impact Of CHB

Numerous research works have examined the social obstacles faced by individuals with hepatitis B, with the most noteworthy being social stigma and prejudice. The process of social connections in patients with HBV infection was examined in a qualitative study employing grounded theory. The primary concern for patients, according to the research, was "maintaining normal social interactions" after receiving a diagnosis. Patients responded to this issue in a number of ways, such as by compromising with their sickness, taking care of others as well as themselves, and concealing it from others. In addition, ideas like social shame, dread of the ill in society, and inadequate assistance from the government were taken out. The study's findings indicate that

individuals avoid intimate contact with those who may have hepatitis due to a variety of environmental and cultural reasons (Zabihi et al., 2017).

Research looked into confronting the stigma caused by HBV infection as a "blind spot," in which stigma and a lack of awareness about the disease were introduced as barriers to HBV diagnosis and treatment. The successful implementation of prevention, diagnosis, and treatment of HBV is greatly hampered by stigma, which has a negative effect on seeking assistance, screening, and disclosure of the disease. This was noted as a "blind spot" and suggests that more research is needed in this area due to the paucity of information and opinions (Mokaya, McNaughton, Burbridge, Maponga, O'Hara, Andersson, & Matthews, 2018). The experiences of CHB patients were examined in another study conducted in China, and the results indicated that social stigma had a significant role in these patients' loss of employment chance, forbid to work in a restaurant and felt unwanted by their partner resulting in some problem for their households (Huang, Guan, Balch, Rao, Lin & Lok, 2016).

The underestimate of the sickness, disease hiding, normalization of social behavior, self-care practices, dealing with illness throughout time, and commitment to religion beliefs and teachings were some of the subsidiary themes identified by Valizadeh et al. (2019). Findings from a different study indicated that hepatitis B and C patients' psychosocial problems and quality of life were

significant determinants (Enescu et al., 2014). Three themes emerged from the research "Self-Care Efforts in Patients with Chronic Hepatitis": the need to seek knowledge, unfavorable attitudes toward the illness, and insufficient resources. One of the biggest obstacles for patients is their fear of passing the illness to their unborn child when they are pregnant. Yogeswaran and Fung (2011) looked at the difficulties of having chronic hepatitis B when pregnant in a review paper. They stressed how important it is to diagnose and treat CHB during pregnancy.

2.4 Prevalence of Depression, Anxiety and Stress

2.4.1 Depression

Depression is an important public health concern and one of the main global sources of illness burden. In the United States, it is often called “The common cold of mental health.” Most people occasionally are affected and in most cases it is self-limiting. From 172 million in 1990 to 25 million in 2017, there were incident instances of depression globally, a rise of 49.86% (Liu et al., 2020). According to WHO (2022), a prolonged period of depressions is the hallmark of depression, also known as depressive disorder, which is a common mental illness characterized by loss of pleasure or lack of interest in activities normal mood swings or sentiments associated with daily life are not the same as a depressive state. A depressive state can affect many aspects of life, such as relationships with friends, family and the community. It can also be the source of problems at work.

Global Health Data Exchange as cited in WHO (2022), depression can happen to anyone. Depression is more common in those who have experienced abuse significant losses or other stressful events. Women are more likely to have depression than men. There are approximately 280 million people worldwide who suffer from depression. This amounts to 3.8% of people including 5% adults (4% among men and 6% among women) and 5.7% are adults over 60. The prevalence of depression is roughly 50 times higher in women than in men. Figure traced using symptom scales was significantly higher than prevalence derived using diagnostic instruments.

Additionally, ratio was significantly higher in women from low and middle-income countries compared to women from high income countries. Studies in low-income countries were especially scarce in this review demonstrating a need for more epidemiological research in those regions a systematic review and meta-regression of the prevalence and incidence of perinatal. (Woody, Ferrari, Siskind, Whiteford & Harris, 2017). And other study shows that, there was a statistically significant decrease in depression (39.5% vs. 60.5%) among patients with higher incomes. Higher income and being self-employed were positively correlated with a decreased prevalence of depression when compared to low income and unemployment (Diagne, Hakima, Harch, Benmaamar, Nassiba, Hind, & Tachfouti, 2022).

A survey carried out by WHO in association with Jimma University revealed that the prevalence of depression in Ethiopia was 9.1%, despite the fact that there was insufficient data from a nationwide survey to ascertain the condition's prevalence. On the other hand, a 2012 report from the Ethiopian Federal Ministry of Health said that 5% of Ethiopians suffered from depression. However, the methodology or source for obtaining the statistic was not specified (Bitew, 2014).

As Bitew 2014 claims, that almost all articles state that compared to unmarried/married women and men, women in general and divorced/widowed women in particular had a greater risk of depression. Sex hormones may have some impact on depression, which explains why the prevalence rate is higher in women than in men. For other reasons, however, social scientists concentrate on gender issues and male and female social norms. They claim that parents unconsciously start placing greater restrictions on their daughters than on their sons. This puts their daughters at risk for depression by lowering their feeling of self-worth and self-control (Bitew, 2014).

In Ethiopia 9.1% of people had a depressive episode (95% CI: 8.39-9.90). A Univariate analysis revealed that the following factors were associated with depression: place of residence, age, married status, educational attainment, number of chronic noncommunicable illnesses (such as arthritis, diabetes, and heart disease), and alcohol use. Odds ratios for depression were only substantially greater for older age, being divorced or widowed, having a larger number of chronic

non-communicable illnesses identified, and consuming alcohol after full correction for any confounding. The percentage of people with depressive episodes who visited a health facility was 22.9% (Hailemariam, Tessema, Asefa, Tadesse, & Tenkolu, 2012).

In a study it was shown that the prevalence of depression on an elderly population aged >60 was 41.8% (CI = 38.5%, 45.5%). Female sex was disclosed using the multivariable logistic regression model. It was discovered that depression was more prevalent in elderly adults. Depression screening and treatment need to be prioritized, particularly for older women, retirees, adults with children, and business owners among (Mirkena, Reta, Haile, Nassir, & Sisay, 2018). The results also showed that among older Ethiopian adults, having chronic diseases (AOR = 2.46, 95% CI: 1.00-6.06), not having any formal education (AOR = 1.82, 95% CI: 1.03, 3.19), being female (AOR = 1.76, 95% CI: 1.17, 2.63), and having no social support (AOR = 2.01, 95% CI: 1.06, 3.83) were independent predictors of depression. A meta-analysis and systematic review revealed that depression affected nearly two out of every five older persons. In Ethiopian older individuals, depression was independently predicted by having a female partner, not attending formal schooling, having a chronic illness, and having no social support. The study emphasizes that depression among older adults in Ethiopia calls for appropriate screening and interventions to reduce the occurrence and its overwhelming consequences (Kasa, Lee, & Chang, 2022).

2.4.2 Anxiety

Anxiety disorders, marked by persistent and excessive fear and worry, and some of the most prevalent mental health conditions worldwide. The World Health Organization (WHO) estimates that about 3.6% of the global population, or roughly 264 million individuals, are affected by anxiety disorders at any given time (WHO, 2017).

In Africa, anxiety disorders are significantly prevalent but frequently under-reported due to inadequate mental health services and societal stigma. Baxter Scott, Vos & Whiteford (2014) conducted a meta-analysis indicating a 4.4% prevalence rate of anxiety disorders in Africa, highlighting the critical need for enhanced mental health care infrastructure and increased awareness across the continent.

In Morocco a study reveals that patients experienced anxiety, with a male preponderance of 51.3% vs. 48.7%) ($p = 0.834$). Respondents who were 50 years of age and older scored considerably higher on anxiety than those in age groups under 50. The literate had a substantially lower anxiety score than the illiterate (48.7% vs. 51.3%) ($p = 0.029$) and the married were likewise significantly higher than the single. Anxiety levels were higher among participants with low monthly incomes (65.8% vs. 34.2%), with a statistically significant difference ($p = 0.001$) (Diagne, Hakima, Harch, Benmaamar, Nassiba, Hind, & Tachfouti, 2022).

A systematic review by Belete, Misganaw & Shemsu (2020) revealed that the prevalence of anxiety disorders in Ethiopia ranged from 5.8% to 28.3%. Higher rates were particularly observed among specific groups such as adolescents and individuals living with chronic illnesses, underscoring the considerable burden of anxiety disorders in this region. These findings emphasize the urgent necessity for targeted mental health interventions and services to address this significant public health issue effectively. Enhanced mental health care infrastructure, combined with greater awareness and educational efforts, is crucial to mitigate the impact of anxiety disorders in Ethiopia and similar settings.

2.4.3 Stress

Stress, defined as the body's response to demands or challenges, can cause a variety of physical and psychological symptoms, impacting overall well-being. Globally, stress is widespread, with the American Institute of Stress (2021) indicating that most people encounter significant stress at some point due to health concerns, work and financial pressures.

In Africa, stress levels are particularly high due to socio-economic challenges, political instability, and limited healthcare access. A study by Docrat, Besada, Cleary, Daviaud & Lund (2019) noted that around 30% of individuals in low and middle-income African countries report high stress levels, with significant regional variability.

In Ethiopia, stress prevalence is concerning, especially among groups such as students, healthcare workers, and those with chronic illnesses. Birhanu, Tareke, Biresaw, Alemu, Anbessie & Dachew (2018) found that, 52.4% of Ethiopian medical students experience high stress, highlighting severe mental health challenges. These findings highlight the urgent need for effective stress management and mental health support systems in Ethiopia and across Africa.

2.5 Depression, Anxiety and Stress Among people Living with CHB virus

2.5.1 Depression Among People Living with CHB

Depression can exacerbate the health consequences of other chronic conditions that it frequently co-occurs with. Research on how depression affects general health status, either on its own or in combination with other conditions, is few. The findings show how urgent it is to treat depression as a public health priority in order to lower the burden of disease, disability and enhance population health overall (Moussavi et al., 2007).

Patients with medical illnesses are especially prone to depression; in fact, their risk of developing depression is higher than that of the general population in many of these patient categories. Patients with significant chronic medical illnesses, such as those affecting the immunological or inflammatory systems, have a higher risk of depression. Patients with chronic hepatitis who are not receiving antiviral medication frequently complain of depression. Given that

depression exacerbates the consequences of co-morbid medical illnesses, it has been suggested that determining whether depression screening is necessary for hepatitis patients requires a precise assessment of the incidence of depression in chronic hepatitis B and C (CHB, CHC) patients (Forton et al., 2002; Gold et al., 2020; Hanly et al., 2005; Kronish et al., 2006).

Studies indicate that depression rates among patients with chronic liver disease vary widely across different regions. For instance, previous research found depressive symptoms in 68% of patients in Vietnam (Alian, Masoudzadeh, Khoddad, Dadashian, & Mohammadpour, 2013), 37.5% in Iran, and 49% in Turkey (Keskin, Gümüs, & Orgun, 2013). In the Vietnamese general population, however, Vu T. (2019) reported a much lower prevalence rate of 1.36%. Vu T.'s study also identified a high prevalence of depression (47.9%) among patients with chronic viral hepatitis. These findings are consistent with broader literature, which estimates that depression affects between 20% and 70.6% of individuals with chronic liver disease.

The study found that depression was more prevalent among people with CHB than in HBsAg-negative healthy controls, with 57.8% of CHB patients experiencing depression compared to 35.6% of controls. Mild depression was common in both groups, but moderate and moderately severe depression were significantly higher among CHB patients. Depression was also more frequent in female CHB patients (Rahman, Noor-E-Alam, Rahim, Das, Ahmed, Al Mamun &

Mahmood, 2023). In addition to this, higher prevalence of depression in patients with hepatitis B in comparison with HBsAg-negative healthy controls 58.6% and 37.8% respectively (Qureshi, Khokhar & Shafqat, 2012).

2.5.2 Anxiety Among People Living with CHB Virus

An investigation of the anxiety caused by Hepatitis B was conducted in Australia, where around 76% of patients reported experiencing anxiety related to Hepatitis B. Concerns about liver cancer (57%) and illness transfer to others (53%) were the most prevalent. Chronic liver disease is a long-term condition with a poor outlook, posing risks to both the mental and physical health of patients. Current treatments for hepatitis B cannot fully eradicate the virus, which often leaves patients feeling hopeless about the disease's incurability. Many experiences intense anxiety about their prognosis, alongside the psychological and financial stresses of ongoing treatment. Concerns about the progression and contagious nature of hepatitis B add to this burden. Mood disorders in these patients arise not only due to hepatic encephalopathy but also from the disease itself (Zhu, Gu, Zhang, Su, Wang, Zheng, & Gao, 2016).

A study shows CHB people have higher anxiety than healthy individual (Alavian, 2007) and this is consistent with a recent study patients experience anxiety and depressive disorders more often than healthy individuals due to various factors, such as stigma, discrimination, fear of death, and

worry about transmitting the illness to others (Kıratlı, 2024). It is also identified a high prevalence of anxiety (41.5%) among patients with chronic viral hepatitis. And othe findings shows, which estimates anxiety affects with the rates range from between 13% to 71.6% of individuals with chronic liver disease (Vu T, 2019).

2.5.3 Stress Among People Living with CHB Virus

Those with a diagnosis of CHB infection may experience severe psychological stress. Up to 90% of people with HBV infection report having experienced a considerable amount of stress after their diagnosis, according to research, which may have an impact on the development, progression, and results of liver disorders (He, Gao, Li, & Zhao, 2014). The immune-pathogenesis of HBV-related liver disorders has been linked to stress-induced changes in the type-1/type-2 cytokine balance in chronic hepatitis B, which lean towards a type-2 response (He et al., 2014).

People with Chronic Hepatitis B (CHB) experience a lot of stress and worry about their health. They are afraid of their disease getting worse and causing complications, which can affect their mental well-being. They also worry about passing the disease on to their loved ones, like their children or partners. For example, they may be scared of dying early and leaving their family behind, or they may feel anxious about infecting their children or partners with the disease. This constant

fear and worry can have a negative impact on their mental health. (Ibrahim, Zovich, Ansah, Freeland, Jackson, & Cohen, 2024).

In general, Zabihi (2020) conclude that people living with CHB suffer from a variety of physical, mental, and social issues. Effective treatment and enabling these people to live with as few obstacles and constraints as possible depend on our ability to comprehend and assist them. The emotional struggles that people with CHB face, as they navigate the challenges and uncertainties of living with a chronic illness (Ibrahim, et al., 2024).

2.6 Association of Depression, Anxiety, Stress, and Sociodemographic Factors with Chronic Hepatitis B

Socio-demographic factors play a significant predictive role in the mental health outcomes of CHB patients, influencing levels of depression, anxiety, and stress. Gender, for instance, is a notable predictor, with studies showing higher rates of depression and anxiety among female CHB patients compared to their male counterparts. Biological differences and gender-based social roles may contribute to these disparities, as females generally exhibit stronger immune responses to viral vaccines, including hepatitis, than males (Allain et al., 2022). Age also serves as a predictor, with research indicating that younger individuals with chronic diseases experience heightened psychological distress, while older adults with CHB are more likely to experience depression (Xiao, Shi, Dong, Zheng, Xue, Zhang, & Zhang, Cet al., 2022). Stress is often found to peak among

patients in the 31–40 age range, likely due to social and economic pressures common at this stage of life (Kong et al., 2021).

Educational attainment impacts mental health, as higher education is associated with lower levels of anxiety and stress due to improved coping skills and health literacy. In contrast, individuals with no formal education may be more susceptible to anxiety, highlighting the protective role of education (Najaf et al., 2019). Socioeconomic status, particularly income, also significantly affects mental health outcomes, with higher-income CHB patients generally reporting lower rates of depression and anxiety due to reduced financial stress and better access to healthcare. Lower-income patients, in contrast, frequently report higher stress levels due to the financial burden of ongoing medical care (Diagne et al., 2022). Marital status further influences mental health, with married CHB patients generally experiencing lower levels of depression, possibly due to spousal support, while widowed or divorced patients may face greater vulnerability to psychological distress (Zhu et al., 2022).

The duration since diagnosis and adherence to medication follow-up are additional predictors of mental health outcomes. CHB patients who have lived with the disease for extended periods are more prone to anxiety due to the chronic stress of managing a long-term illness. Additionally, inconsistent medication follow-up can increase both anxiety and depression levels, as

it introduces uncertainty about health status (Xu et al., 2018; Kong et al., 2021). Together, these socio-demographic factors offer valuable insights into the psychological experiences of CHB patients and underscore the importance of addressing these predictors in mental health interventions.

2.7 Theoretical framework

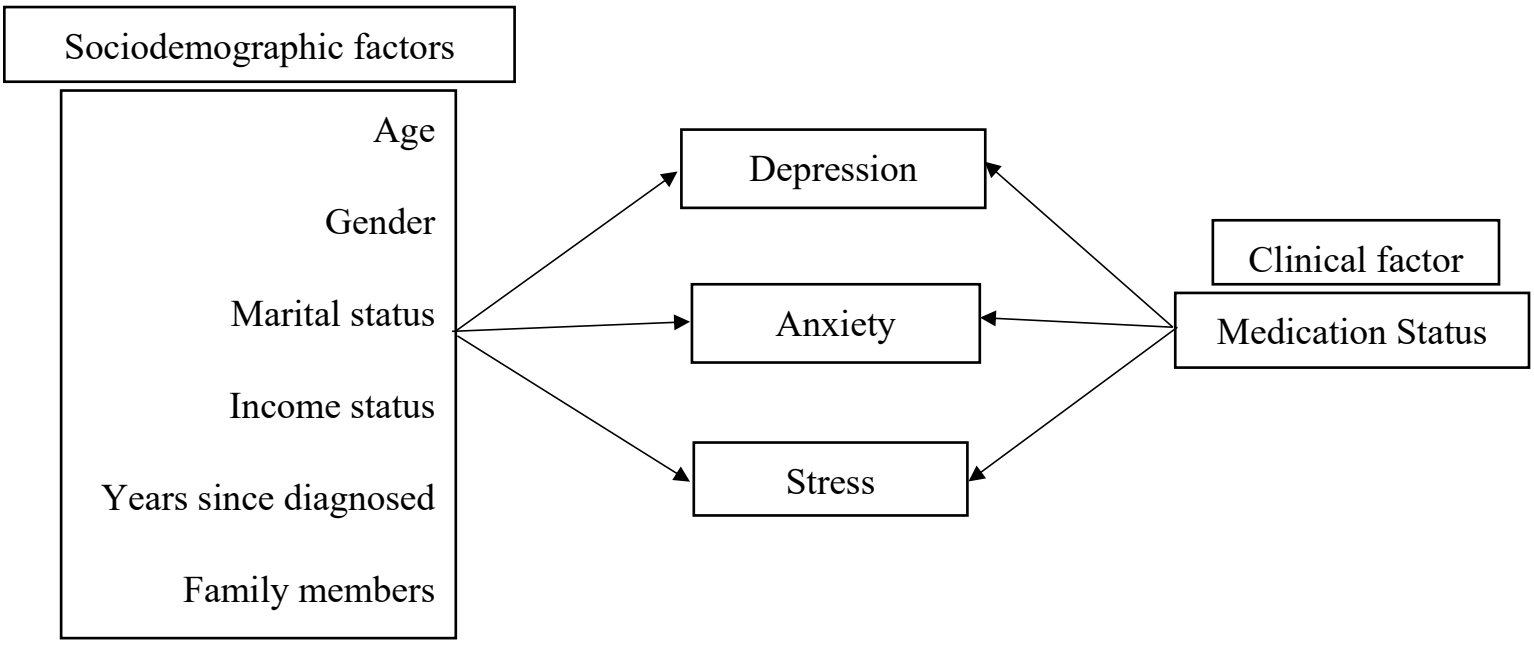
Chronic illness, including Hepatitis B (HBV), is often associated with increased psychological distress, manifesting as depression, anxiety, and stress. Research suggests that managing chronic illness places a substantial mental health burden on individuals due to the ongoing health challenges and lifestyle adjustments it requires (Egede, 2007; Moussavi et al., 2007). Specifically, chronic Hepatitis B contributes significantly to morbidity and mortality, which can exacerbate psychological distress (Vu et al., 2019).

This study aims to examine the depression, anxiety, and stress among chronic Hepatitis B patients at St. Paul's Hospital Millennium Medical College, exploring the association between HBV and psychological conditions. It also investigates whether socio-demographic variables such as age, gender, educational status, marital status, and economic status and clinical factors like medication adherence and duration since diagnosis, predict variations in psychological distress levels.

By drawing on the biopsychosocial model (Engel, 1977), this study considers both biological factors (chronic HBV) and socio-demographic characteristics that may impact mental health

outcomes. The biopsychosocial model provides a comprehensive framework for understanding the interactions between biological, psychological, and social factors in influencing mental health (Lehman et al., 2017). This framework supports exploring how HBV, in conjunction with socio-demographic variables, contributes to mental health symptoms, thus identifying potential intervention points to enhance patient care.

2.8 Conceptual Framework



Chapter Three - Research Methods

3.1. Research Design

The study used an institutional based cross-sectional research design. The quantitative method was used to measure the prevalence and level of depression, anxiety and stress among chronic Hepatitis B people at St. Paul's Millennium Hospital Medical College. The cross-sectional design is preferable because this research design is suitable for its efficiently captures the prevalence of depression, anxiety, and stress among chronic Hepatitis B people at St. Paul's Millennium Medical Hospital College at a single point in time. This design allows for the examination of associations between mental health outcomes and variables like age, gender, and medication follow-up status, providing valuable insights without the need for long-term observation. Even though cross-sectional study does not establish causation, it can identify predictive factors using regression analysis, making it a practical, resource efficient approach that aligns well with the study's objectives.

3.2. Study site, population and sampling

3.2.1 Study Site

The study was conducted at St. Paul's Hospital Millennium Medical College. The hospital was established in 1968 by Emperor Haile Selassie and is managed by the Federal Ministry of Health. The college provides medical and nursing education, performs fundamental and applied research, and offers specialized medical services to referred patients nationwide.

This research took place in one of the regular outpatient departments and focused on patients enrolled in the Hepatitis B Longitudinal Cohort research program, which has been active since 2015 (Desalegn, 2023). While the study is directed by Addis Ababa University's Aklilu Lemma Institute of Pathobiology and Oslo University in Norway, the patient follow-up is conducted at St. Paul's Hospital Millennium Medical College.

3.2.2 Population

The study population included people who tested positive for hepatitis B surface antigen (HBsAg) and were receiving follow-up care in the outpatient department. These individuals have been part of the Hepatitis B Longitudinal Cohort research program at St. Paul's Hospital Millennium Medical College since 2015. As of the latest project data, the cohort includes a total of 735 patients.

3.2.3 Sample Size Determination

These 735 patients (which are 541 patients are in a regular follow up and 194 patients are on anti-viral medication treatment follow up) actively following their follow up now in the Hepatitis B project since 2015G.C.

The sample size was determined using Yemane's (1967) formula, with assumptions of a 95% confidence level, a 5% margin of error, and a 10% non-response rate. A stratified sampling method (grouping participants by those taking and not taking medication) and simple random sampling were

used, resulting in a minimum sample size of 142 for non-treated patients and 143 for treated patients, plus an additional 10% (26 participants) to account for potential non-responses, yielding a final calculated sample size of 285. However, only 262 participants were successfully enrolled in the study, which is close to the initial required sample size of 259 prior to the non-response rate adjustment.

$$n = \frac{N}{1+N(e)^2}$$

$$n = \frac{(735)}{1+735(0.05)^2}$$

Where: - n = sample size N = population e = margin of error

$$n = \frac{(735)}{2.83}$$

n= 259 + 26 = 285

3.3 Inclusion and Exclusion Criteria

3.3.1 Inclusion

- All individuals living with CHBV and are on follow up at St. Paul's Hospital Millennium Medical Hospital College who enrolled in a longitudinal cohort study were included in this research.

3.3.2 Exclusion

- Individuals living with CHB who had regular follow-up at St. Paul's Hospital Millennium Medical College lost from follow-up; have HIV and other viral disease were excluded from this study.

- Also, patients who are receiving medical treatment from St. Paul's Hpspital Millennium Medical College for cases other than CHB or in follow-up but are not included the cohort study.

3.4 Data Collection Instruments

- **Sociodemographic characteristics questionnaire:** The questionnaire contained 8 items and respondents were asked to indicate their age, sex, marital status, educational status, work setting years of work experience. Indeed, age, sex and educational qualification and years of work experience were utilized to address the stated objectives.

- **Depression, anxiety and stress scale - 21 items (DASS-21):** The instrument utilized for data collection in this study was the standardized Depression, Anxiety, and Stress Scale (DASS-21). This self-administered measure evaluates negative emotional states, focusing on stress, anxiety, and depression. The DASS-21 serves as a condensed version of the DASS-42 and comprises three separate sub-scales, each containing seven items that assess the respective emotional states. Responses to the DASS-21 are scored using a 4-point severity scale, ranging from 0 to 3. Scores are classified into categories: normal, mild, moderate, severe, and extremely severe (Lovibond &

Lovibond, 1995b). The score can vary from a minimum of 0 to a maximum of 21 and is further categorized based on defined cutoff points. The items pertaining to depression include numbers 3, 5, 10, 13, 16, 17, and 21; anxiety is represented by items 2, 4, 7, 9, 15, 19, and 20; while the stress sub-scale includes items 1, 6, 8, 11, 12, 14, and 18. Each sub-scale can be completed in just a few minutes.

- **Reliability and validity of data instrument:** It has been demonstrated that the DASS-21 has sufficient construct validity. Confirmatory component analysis (CFA) modeling findings show that while the three DASS-21 scales measure a significant shared factor (general psychological distress), each scale also has variation unique to it. The DASS-21 scales have strong reliabilities; Cronbach's alpha was used to measure the internal consistencies of the Anxiety, Depression, Stress, and Total scales. α was 0.88 for the Depression, 0.82 for Anxiety, 0.90 for Stress scales; and 0.93 for the Total scale were found. Comparing the DASS-21 to the full-length DASS, there are several benefits. It is still sufficiently reliable, but it is shorter and hence more acceptable for clients who have trouble focusing. Furthermore, it contains a more streamlined latent structure and leaves out components from the entire DASS that were shown to be troublesome (Henry & Crawford 2005).

Eleni (2020) previously reported that a translation process from English to Amharic for assessment instruments was conducted by one MA student in counseling psychology and MA

students in the TEFL (Teaching English as a Foreign Language) department at Addis Ababa University. To ensure the substantive quality and comprehensibility of the items, two counseling psychology professionals validated their content. Subsequently, a pilot test was administered to assess item clarity, linguistic proficiency, measurement reliability, and practicality, as well as to determine suitable methods of measure administration for the primary research. The Cronbach's coefficient values (α) corresponding to depression, anxiety, and stress were found to be 0.82, 0.71, and 0.71, respectively.

- **DASS-21 scoring:** The minimum score is zero and the maximum score is 21. Because the DASS-21 is a short term of DASS-42 the final score for each item group were multiplied by 2. Cut-off scores for conventional severity labels (normal, mild, moderate, severe) are as follows:

Table 1: *DASS-21 Scoring*

	Depression	**Anxiety**	**Stress**
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

3.5 Data Collection Procedures

The data collection process began after the researcher obtained an official letter from the Counseling Psychology program at the Institute of Psychology, AAU, which the letter allowed for getting the support to ethical approval letter from St. Paul's Hospital Millennium Medical College, where patients receive follow-up care, and the ALIPB Academic Research Office, which oversees the study. The researcher met with Institution board representatives from both institutions to explain the study's purpose and logistics. With access to a list of eligible patients and health professionals at the hospital, the researcher selected sample respondents and then consulted with the health professionals to determine suitable dates, times, and methods to administer the questionnaires in a way that minimized inconvenience for the patients. For effective administration, four health professionals were trained as data collectors and later called the selected participants directly, informing them of the study and confirming their availability to complete the questionnaire. On the selected days, the trained professionals provided participants with both verbal and written informed consent before distributing the paper based DASS-21 questionnaires during their scheduled appointments. This approach helped maximize the response rate and reduce time delays, ensuring an efficient data collection process.

3.6 Data Analysis

The primary aim of this study was to investigate the prevalence and levels of depression, anxiety, and stress among chronic Hepatitis B (CHB) patients, as well as the relationship between these conditions and various socio-demographic factors. To achieve these objectives, both descriptive

and inferential statistics were used. First, data collected from participants were coded and entered into SPSS (version 27), with thorough screening to identify and correct any missing or inaccurate responses. Descriptive statistics were applied to calculate prevalence rates of depression, anxiety, and stress among CHB patients, addressing the first research objective.

To analyze associations between socio-demographic factors (age, gender, follow-up status, education, marital status, family size, income, and duration since diagnosis) and levels of depression, anxiety, and stress, a Chi-square test was used. This test examines the associations between categorical variables, aligning with the study's objective of identifying associations. The categorical nature of socio-demographic factors, supports the choice of Chi-square for detecting significant associations with mental health outcomes.

To identify predictors of depression, anxiety, and stress, bivariate logistic regression was applied. Variables with a Chi-square p-value below 0.25 were entered into the regression to control for potential confounding. Those with a p-value below 0.05 in logistic regression were identified as significant predictors of depression, anxiety, and stress among the participants.

3.7 Ethical Considerations

Prior to data collection, ethical approval was obtained from AAU school of Psychology. Additionally, the hepatitis B project is under the ALIPB and placed at St. Paul's Hospital Millennium Medical College the IRB for permission were grant from both institutes. For each study participant, verbal and paper based informed consent were obtained following a clear explanation of the study's objectives. All collected information will be treated as confidential and kept private throughout the research process. Participant data were coded to ensure personal privacy, and cultural norms will be respected. The study poses minimal risk to participants, requiring only 2-5 minutes of their time to complete the questionnaire. Participants will benefit by learning about their Depression, Anxiety, and Stress status and will be advised to seek professional help if necessary. Participation in this study was entirely voluntary, and participants were well informed to withdraw at any time without any consequences. Finally, the results will be disseminated to the location where the study is conducted and to the School of Psychology at Addis Ababa University.

Chapter Four - Results

The present study's findings are examined in this part in relation to the research questions that were posed in the study's introduction. Therefore, both descriptive and inferential statistics were used to answer the study questions.

4.1 Sociodemographic Characteristics of Participants

As shown in Table 2, a total of 262 study participants were participated in the study. The sample included 52.3% males and 47.7% females, with the largest age group being 31-40 years (35.9%). Medication follow-up was nearly even, with 49.6% taking and 50.4% not taking medication; of those, 48.9% adhered regularly. Most participants were married (45.8%) and had at least some college education (34.7%). Income levels were predominantly low (57.6%), and family member, with 40.5% in households of 2-5 people. Most participants had been diagnosed for 8-12 years (70.2%), followed by 13-17 years (24.4%).

Table 2: *Socio-demographic characteristics of participants (N=262)*

Variables	Categories	Frequency	Percent (%)
Gender	Male	137	52.3%
	Female	125	47.7%
Age	21-30 years	35	13.4%
	31-40 years	94	35.9%
	41-50 years	69	26.3%
	51 years and above	64	24.4%
Follow up status	taking medication	130	49.6%
	not taking medication	132	50.4%

Medication adherence	Yes	128	48.9%
	No	2	0.8%
Marital status	Single	94	35.9%
	Married	120	45.8%
	Divorced	32	12.2%
	Widowed	16	6.1%
Education status	No formal education	37	14.1%
	Elementary school	78	29.8%
	Secondary school	56	21.4%
	College and above	91	34.7%
Income	Low	151	57.6%
	Middle	107	40.8%
	High	4	1.5%
family size	Live alone	65	24.8%
	2-5 members	106	40.5%
	6 and above	91	34.7%
year since diagnosed	8-12 years	184	70.2%
	13-17 years	64	24.4%
	18 and above	14	5.3%

4.2 Depression, Anxiety, and Stress Level of Participants

The overall prevalence of depression, anxiety and stress were 24% (95% CI: 19.0-29.6), 23.6% (95% CI: 18.6-29.2) and 19.0% (95% CI: 14.5-24.4) respectively. Among different sociodemographic characteristics of the study participants, higher prevalence of depression, anxiety and stress were found among participants whose education level is up to elementary school 33.3%, 38.4% and 32.1% respectively. Prevalence of depression between female and male was almost similar 23.2% and 24.8%. In the case of anxiety higher prevalence scored among female 28.8%,

whereas among male participants were 18.9%. prevalence of stress among male and female were 16.1% and 22.4%.

The frequency of stress, anxiety, and depression level in individuals with chronic hepatitis B virus infection is shown in the following tables (*Tables 3, 4, and 5*). Each aspect's score was computed independently in this case, and according to the DASS-21, the categorizations fall into five groups: normal, mild, moderate, severe, and extremely severe.

4.2.1 Depression Level of the Participants

According to the analysis of depression scores presented in Table 3, the depression scores show that 76.0% of participants fell within the normal range, while 10.7% had mild scores. Moderate scores (14-20) were seen in 6.9% of participants, severe scores in 2.3%, and extreme severity in 4.2%. These findings suggest that, overall, the mental health of the respondents is relatively stable, with a limited number of individuals facing significant depressive symptoms. This distribution highlights that while most participants are not significantly affected by depression, there are still some who experience mild to severe depressive symptoms.

Table 3: *Level of depression among participants*

Scores	Magnitude/Level	Frequency	Percentage%
0-9	Normal	199	76.0%
10-13	Mild	28	10.7%
14-20	Moderate	18	6.9%
21-27	Sever	6	2.3%
28+	Extreme sever	11	4.2%

4.2.2 Anxiety Level of the Participants

According to the analysis of anxiety scores indicate that 76.3% of participants were in the normal range, while 5.0% had mild scores. Moderate scores were reported by 13.4% of participants, severe scores by 3.8%, and extreme severity by 1.5%. These results suggest that the overall mental health of the respondents, in relation to anxiety, with higher severity levels being relatively uncommon among the participants. This distribution emphasizes the prevalence of normal anxiety levels and, the incidence of more severe anxiety is quite low within this population.

Table 4: *Level of anxiety among participants*

Scores	Magnitude/Level	Frequency	Percentage
0-7 Normal	Normal	200	76.3%
8-9 Mild	Mild	13	5.0%
10-14 Moderate	Moderate	35	13.4%
15-19 Sever	Sever	10	3.8%
20 + Extreme sever	Extreme sever	4	1.5%

4.3.3 Stress Level of the Participants

The stress levels of respondents show that 80.9% were in the normal range (0-14), while 5.7% experienced mild stress (15-18). Moderate stress levels (10-14) were reported by 7.3% of participants, and 4.6% had severe stress levels (15-19). The distribution highlights the overall low incidence of higher severity of levels of stress among the participants.

Table 5: *level of stress among participants*

Scores Magnitude	Magnitude/Level	Frequency	Percentage %
0-14 Normal	Normal	212	80.9%
15-18 Mild	Mild	15	5.7%
10-14 Moderate	Moderate	19	7.3%
15-19 Sever	Sever	12	4.6%

4.3 Association Between Depression, Anxiety Stress and Socio-Demographic Characteristic

As Table 6 shows, the Chi-square analysis explored associations between socio-demographic variables and mental health outcomes depression, anxiety, and stress among participants. For age, gender, marital status, follow-up status, medication adherence, family size, and years since diagnosis, no significant associations with depression, anxiety, or stress were observed, as all p-values exceeded the 0.05 threshold. However, education level showed significant associations with anxiety ($p = 0.002$) and stress ($p = 0.004$), indicating higher anxiety and stress levels among participants with lower education levels. Additionally, income level was marginally associated with depression ($p = 0.048$), suggesting that participants with lower incomes tended to report higher depression levels. These findings suggest that while most socio-demographic factors had no statistically significant association with mental health outcomes, education and income levels may notably associate with anxiety, stress, and depression among this population.

Table 6. *Association Depression, Anxiety and Stress among Sociodemographic Characteristic of the Participant (n=262)*

Variables	Category	Depression				Anxiety				Stress			
		No, n (%)	Yes, n (%)	X^2 value	p-value	No, n (%)	Yes, n (%)	X^2 value	p-value	No, n (%)	Yes, n (%)	X^2 value	p-value
Age	21-30years	28 (80.00)	7 (20.00)	1.403	0.705	27 (77.2)	8 (22.8)			30 (85.7)	5 (14.3)	3.129	0.372
	31-40years	69 (73.4)	``			70 (74.5)	24 (25.5)			80 (85.2)	14 (14.8)		
	41-50years	55 (79.7)	14 (20.3)			55 (80.0)	14 (20)			53(76.8)	16 (23.2)		
	51years and above	47 (73.5)	17 (26.5)			48 (75.0)	16 (25.0)	0.692	0.875	49 (76.6)	15 (23.4)		
Sex	Male	103 (75.2)	34 (24.8)	0.093	0.76	111 (81.0)	26(19.0)			115 (84.0)	22(16.0)		
	Female	96 (76.8)	29(23.2)			89 (71.2)	36 (28.8)	3.490	0.062	97 (77.6)	28(22.4)	1.702	0.192
Follow up status	Taking medication	94 (72.3)	36 (27.7)	1.878	0.17	96(73.8)	34 (26.2)			104 (80.0)	26 (20.0)		
	Not-taking medication	105 (79.55)	27(20.45)			104 (78.8)	28(21.2)	0.885	0.347	108(81.8)	24 (18.2)	0.140	0.708
Medication adherence	Yes	93 (72.0)	36 (28.0)	0.769	0.38	96 (74.4)	33 (25.6)			104 (80.6)	25 (19.4)		
	No	2 (100)	0 (0.0)			1 (50.0)	1 (50.0)	0.611	0.434	1 (50.0)	1 (50.0)	1.160	0.281
Marital status	Single	74 (78.7)	20 (21.3)	2.362	0.501	73 (77.7)	21(22.3)			78 (83.0)	16(17.0)		
	Married	87 (72.5)	33 (27.5)			91(75.8)	29 (24.2)			98 (81.6)	22 (18.4)		
	Divorced	24 (75.0)	8 (25.0)			22(68.7)	10 (31.3)			23 (71.8)	9 (28.2)		
	Widowed	14 (87.5)	2 (12.5)			14 (87.5)	2 (12.5)	2.231	0.526	13 (81.3)	3 (18.7)	1.997	0.573

Education level	No formal education	28 (75.7)	9 (24.3)	5.976	0.113	29 (78.4)	8 (21.6)	14.4722	**0.002**	30 (81.0)	7 (19.0)	13.591	**0.004**
	Elementary school	52 (66.7)	26 (33.3)			48 (61.5)	30 (38.5)			53 (68.0)	25(32.0)		
	Secondary school	44 (78.6)	12 (21.4)			45(80.4)	11 (19.6)			51 (91.0)	5 (9.0)		
	College and above	75 (82.4)	16 (17.6)			78 (85.7)	13 (14.3)			78 (85.7)	13 (14.3)		
Income	Low	114 (75.5)	37 (24.5)	6.084	***0.048***	110 (72.8)	41 (27.2)	4.619	0.099	121 (80.2)	30 (19.8)	2.890	0.236
	Middle	84 (78.5)	23 (21.5)			88 (82.3)	19 (17.7)			89 (83.2)	18 (16.8)		
	High	1 (25.0)	3 (75.0)			2 (50.0)	2 (50.0)			2 (50.0)	2 (50.0)		
family size	Live alone	56 (86.2)	9 (13.8)	4.924	0.085	52 (80.0)	13 (20.0)	1.923	0.382	55 (84.6)	10 (15.4)	0.802	0.670
	2-5 members	77 (72.6)	29 (27.4)			83 (78.3)	23 (21.7)			85 (80.2)	21 (19.8)		
	6 and above	66 (72.5)	25 (27.5)			65 (71.4)	26 (28.6)			72 (79.2)	19 (20.8)		
year since diagnosed	8-12years	140(76.1)	44 (23.9)	2.775	0.25	138 (75.0)	46 (25.0)	0.976	0.614	145 (78.8)	39 (21.2)	2.320	0.313
	13-17years	46 (71.9)	18 (28.1)			50 (78.1)	14(21.9)			54 (84.4)	10 (15.6)		
	18 and above	13 (92.8)	1 (7.2)			12 (85.7)	2 (14.3)			13 (92.8)	1 (7.2)		

Chi-square test was computed and significance level was <0.05

4.4 Sociodemographic Predictors of Depression

Table 7 shows that, after a purposeful selection of variables with a p-value cutoff of less than 0.25 from the univariate analysis (chi-square), a binary logistic regression model with multiple independent variables is used to predict the likelihood of depression based on sociodemographic and clinical predictors of depression.

The analysis shows that participants with high income had significantly higher odds of depression (AOR = 11.7, 95% CI: 1.2-123.5, p = 0.040) compared to those with low income. Likewise, those with family sizes of 2-5 and 6 and more had increased odds of depression, with AORs of 3.3 (95% CI: 1.3-8.4, p = 0.010) and 2.7 (95% CI: 1.1-7.1, p = 0.033), respectively, compared to individuals living alone. Other factors, such as education, years since diagnosis, and medication status, were not significantly associated with depression ($p > 0.05$). This suggests income and family size are significant predictors of depression, highlighting socio-economic factors for possible intervention.

Table 7. *Logistics regression analysis of socio-demographic characteristics and depression*

Variables	*Categories*	Depression		AOR (95%CI)	P-value
		NO, n (%)	YES, n (%)		
Education level	No formal education	28 (75.68)	9 (24.32)	Ref.	
	Elementary school	52(66.67)	26 (33.33)	0.98(0.36-2.6)	0.960
	Secondary school	44 (78.57)	12 (21.43)	0.62(0.21-1.8)	0.390
	College and above	75 (82.42)	16 (17.58)	0.36(0.12-1.04)	0.060
Income	Low	114 (75.5)	37 (24.5)	Ref.	
	Middle	84 (78.5)	23 (21.5)	0.98(0.52-1.8)	0.961
	High	1 (25.00)	3 (75.00)	11.7(1.2-123.5)	**0.040**
family size	Live alone	56 (86.15)	9 (13.0)	Ref.	
	2-5 members	77 (72.64)	29 (27.36)	3.3(1.3-8.4)	**0.010**
	6 and above	66 (72.53)	25 (27.47)	2.7(1.1-7.1)	**0.033**
year since diagnosed	8-12	149 (76.1)	44 (23.9)	Ref.	
	13-17	46 (71.88)	18 (28.1)	1.3(0.69-2.7)	0.361
	18 and above	13 (92.86)	1 (7.14)	0.28(0.03-2.3)	0.247
Follow up	Taking medication	94 (72.31)	36 (27.69)	Ref.	
	Not-taking medication	105 (79.55)	27 (20.45)	0.87(0.46-1.6)	0.685

4.6 Sociodemographic Predictors of Anxiety

Table 8 shows that, after a purposeful selection of variables with a p-value cutoff of less than 0.25 from the univariate analysis (chi-square), a binary logistic regression model with multiple independent variables is used to predict the likelihood of anxiety based on socio-demographic and clinical predictors of anxiety. Accordingly, none of the variables found to be significant predictors of anxiety.

T*able 8.* *Logistics regression analysis of socio-demographic characteristics and Anxiety*

Variables	Categories	Anxiety		AOR(95%CI)	P-value
		NO, n(%)	YES, n(%)		
Education level	No formal education	29(78.38)	8 (21.62)	Ref.	
	Elementary school	48(61.51)	30 (38.46)	2.1(0.83-5.2)	0.116
	Secondary school	45 (80.36)	11(19.64)	0.89(0.31-2.5)	0.833
	College and above	78 (85.71)	13 (14.29)	0.62(0.23-1.6)	0.353
Income	Low	110 (72.85)	41(27.15)	Ref.	
	Middle	88 (82.24)	19 (17.76)	0.7(0.37-1.3)	0.288
	High	2 (50.0)	2 (50.0)	2.5(0.29-21.3)	0.398
Sex	Male	111 (81.0)	26(18.98)	Ref.	
	Female	89 (71.20)	36(28.80)	1.5(0.83-2.77)	0.167

4.8 Sociodemographic Predictors of Stress

Table 9 shows that, after a purposeful selection of variables with a p-value cutoff of less than 0.25 from the univariate analysis (chi-square), a binary logistic regression model with multiple independent variables is used to predict the likelihood of stress based on sociodemographic and clinical predictors.

The analysis shows that participants with a middle income have notably reduced odds of experiencing stress compared to those with a low income (AOR = 0.33, 95% CI: 0.11-0.95, p = 0.042), indicating that a moderate income may have some protection against stress.

Table 9: *Logistics regression analysis of socio-demographic characteristics and stress*

		Stress			
Variables	**Categories**	**NO, n(%)**	**YES, n(%)**	**AOR, (95%CI)**	**P-value**
Education level	No formal education	30(81.0)	7(18.9)	Ref.	
	Elementary school	53(67.9)	25 (32.1)	3.3(0.64-17.2)	0.153
	Secondary school	51 (91.1)	5(8.9)	0.82(0.09-6.8)	0.859
	College and above	78 (85.71)	13 (14.3)	1.3(0.22-8.3)	0.730
Income	Low	121 (80.2)	30(19.8)	Ref.	
	Middle	89 (83.2)	18 (16.8)	0.33(0.11-0.95)	**0.042**
	High	2 (50.0)	2 (50.0)	1.1(0.06-19.5)	0.948
Sex	Male	115 (83.94)	22(16.1)	Ref.	
	Female	97 (77.6)	28(22.4)	2.1(0.8-2.6)	0.129
Medication adherence	Yes	104 (80.6)	25 (19.4)	Ref.	
	No	1 (50.0)	1 (50.0)	9.8(0.45-212.2)	0.145

Chapter Five - Discussion

The purpose of the study was to investigate depression, anxiety, and stress among individuals living with chronic Hepatitis B in St. Paul's Hospital Millennium Medical College.

5.1 Prevalence of Depression, Anxiety, and Stress Among Individuals Living with Chronic Hepatitis B (CHB)

The prevalence rates of depression, anxiety, and stress in individuals with CHB in this study were 24%, 23.6%, and 19%, respectively. Compared to the general population, where depression rates are typically under 10% in Ethiopia (Bitew, 2014), this indicates people with CHB exhibit significantly higher mental health burdens. This heightened prevalence aligns with broader findings indicating elevated risks of psychological distress in patients with chronic liver diseases, including depression rates between 20% and 70.6% and anxiety rates ranging from 13% to 71.6%. These elevated rates can be attributed to the complex physical, social, and psychological impacts of managing a chronic viral condition, as seen in prior research highlighting issues of stigma, isolation, and financial strain as significant contributors to mental health challenges in CHB patients (Freeland et al., 2021; He et al., 2014).

Gender and education also influenced mental health outcomes, with higher anxiety and stress in women (28.8% and 22.4%) than in men (18.9% and 16.1%) (Prevalence Result). This disparity

may relate to added familial responsibilities and concerns over transmission risk (Kong et al., 2021) (literature). Those with only primary education reported the highest rates of depression and anxiety, reflecting potentially limited coping resources. In contrast to studies, high-income individuals also reported notable depression rates, perhaps due to financial stress from long term CHB treatment costs. This underscores the need for targeted mental health support addressing the socio-economic, educational support, and gender-specific challenges faced by Ethiopian individuals with CHB.

In light of these findings, counseling and mental health support should be provided to individuals with CHB, as they experience notably high rates of depression, anxiety, and stress compared to the general or hepatitis B-negative population. Addressing their unique psychological and socio-economic challenges could improve their overall well-being and quality of life.

5.2 The Association Between Depression and Sociodemographic Characteristics of People Living with CHB

The analysis of depression levels among individuals with CHB found a significant association with income, but not with other sociodemographic factors, such as age, gender, or education level. This aligns with research showing that financial strain can heighten vulnerability to mental health challenges in chronic illness populations (Diagne et al., 2022). Unlike general

Ethiopian studies, which often report higher depression rates in women and lower-educated groups (Bitew, 2014), this CHB-specific population shows a unique pattern where income appears more influential. The financial burden of CHB treatment may explain why higher-income patients in this study report elevated depression levels, suggesting that costs of care might outweigh the protective effects usually associated with financial stability.

In comparison to the general Ethiopian population's depression rate of 9.1% (Bitew, 2014), CHB patients exhibit a notably higher prevalence, supporting global findings that link chronic liver conditions with greater mental health risks (Vu et al., 2019) . These findings underscore the need for mental health support in CHB treatment plans, particularly for those facing financial difficulties. Interventions should focus on providing affordable mental health care and financial counseling to reduce the burden of illness-related expenses on mental well-being.

5.3 The Association Between Level Anxiety and Sociodemographic Characteristics People Living with CHB

This study reveals that the association between education level and anxiety prevalence among individuals with CHB, with those having only an elementary education showing a higher likelihood of experiencing anxiety compared to those with higher educational attainment. This finding is consistent with prior studies suggesting that higher education often gives individuals with

greater knowledge and control over their lives, enabling better management of environmental and psychological challenges (Najaf et al., 2019). While income level and other variables did not achieve statistical significance. Similarly, female individuals exhibited higher anxiety levels than males, though this difference was also not statistically significant. These results align with previous studies, such as those by Fauzi et al. (2021) and Garbóczy et al. (2021), which illustrate the complex relationships between demographic factors and anxiety, often showing patterns without strong statistical significance.

5.4 The Association Between Level Stress and Sociodemographic Characteristics People Living with CHB

In this study the association between stress levels and sociodemographic factors in individuals with chronic hepatitis B (CHB) could help identify groups at greater risk of experiencing high stress. For instance, education level seems to be a predictive factor, as those with less formal education tend to report higher stress. This is consistent with research indicating that lower educational attainment can limit health literacy and coping abilities, thereby increasing susceptibility to stress in managing chronic diseases. Financial status also appears to predict stress, with individuals from lower-income backgrounds often facing more pressure. This stress may be intensified by financial challenges related to the costs of chronic illness care and ongoing treatment

needs (Diagne et al., 2022; Xiao et al., 2022). These insights indicate that limited resources are a strong predictor of mental health outcomes for CHB patients.

Gender differences also seem to predict stress, as women reported higher stress levels than men. This trend aligns with broader patterns in chronic illness populations, where social roles and emotional stressors such as caregiving responsibilities heighten women's psychological distress (Belete et al., 2020). Additionally, while not statistically significant, poor medication adherence may predict higher stress levels, as seen in research linking low adherence with increased health anxiety and stress among chronic illness patients. These findings underscore the need for targeted interventions focused on education, financial support, and adherence counseling to potentially reduce stress levels among CHB people, especially in groups where sociodemographic factors may predict higher psychological distress.

Chapter Six - Summary, Conclusion and Recommendations

The summary, conclusions, and recommendations based on the study's findings are presented in this chapter.

6.1 Summary

his study aimed to assess the prevalence and levels of depression, anxiety, and stress among individuals with chronic Hepatitis B (CHB) at St. Paul's Hospital Millennium Medical College. The specific objectives were to explore the associations between socio-demographic and clinical factors (e.g., age, gender, income, education) and mental health outcomes, and to identify key predictors of depression, anxiety, and stress in this population.

The main research questions focused on

- Identifying the prevalence of depression, anxiety, and stress among individuals with CHB,
- Exploring associations between socio-demographic characteristics and these mental health outcomes, and
- Determining significant socio-demographic predictors of each condition.

The study employed an institutional-based cross-sectional design using quantitative methods. Data collection relied on the Depression, Anxiety, and Stress Scale (DASS-21), that assesses

emotional states on these three subscales. A sample of 262 participants was selected using stratified and simple random sampling methods from the CHB outpatient longitudinal cohort study follow-up. After data entry and cleaning on SPSS version 27, descriptive statistics were computed to determine prevalence rates, while Chi-square tests were applied to analyze associations between socio-demographic and clinical factors and mental health outcomes. Binary logistic regression identified significant predictors of depression, anxiety, and stress.

The prevalence of depression, anxiety, and stress among participants was 24%, 23.6%, and 19%, respectively, with females and individuals with lower education levels experiencing higher rates of anxiety and stress. This study results of the Chi-square analysis indicated significant associations between education, income, and mental health outcomes, while age, marital status, and medication adherence did not show significant associations. Logistic regression further revealed that higher income] levels predicted an increased risk of depression, potentially due to social pressures and personal expectations associated with managing chronic illness. Individuals with lower education and income levels were at greater risk of experiencing stress, emphasizing the role of socio-economic factors in the mental well-being of individuals with CHB.

The findings highlight the heightened psychological burden faced by individuals with CHB, aligning with literature that shows an increased risk of mental health challenges among those with

chronic liver diseases. Women reported higher levels of anxiety and stress, likely due to social and familial roles, while lower-educated individuals may have reduced access to coping resources. Higher education was associated with a lower likelihood of anxiety and stress.

6.2. Conclusion

This study assessed the prevalence of depression, anxiety, and stress among individuals with chronic Hepatitis B (CHB) and examined how socio-demographic factors and clinical factor influence these mental health outcomes. The findings reveal a substantial psychological burden, particularly affecting women, individuals with lower education, and those with low income, underscoring their increased vulnerability to the mentioned mental health challenges. These results emphasize the need for comprehensive, targeted mental health interventions, especially for those with fewer socio-economic and educational resources. Integrating mental health support such us counseling and educational programs within CHB treatment plans is essential to improve the quality of life and lower psychological distress among this population.

6.3 Recommendations

- *Monitor and Support Mental Health*: Healthcare providers should actively monitor the mental health of population living with chronic Hepatitis B, especially addressing higher anxiety and

stress in female through targeted counseling and support groups focused on income and education levels.

- *Develop Comprehensive Intervention Strategies*: Further research, combining quantitative and qualitative methods, is needed to identify other factors influencing mental health in this population. This will help create more effective, holistic intervention strategies.

- *Implement Long-term Mental Health Strategies*: Conduct longitudinal studies to understand the long-term mental health outcomes for people living with chronic hepatitis B and guide future support approaches.

- *Enhance Patient Support Systems*: Healthcare administrators and caregivers should establish strategies to help patients manage psychological, social, and physical challenges. Educational and counseling initiatives are essential to address the diverse needs associated with chronic Hepatitis B, promoting patient well-being and minimizing daily limitations.

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Depression, Anxiety and Stress Among People Living Chronic Hepatitis B

Appendix

Appendix I: English Version questionnaire

Addis Ababa University

College of Education and Behavioral Studies School of Psychology

Dear respondents,

I am a postgraduate student at Addis Ababa University, college of education and behavioral studies school of psychology. I am doing a master thesis on entitled: Depression Anxiety and Stress level of chronic Hepatitis B individuals in St. Paul's Hospital Millennium Medical College. This research is being done for the fulfillment of the Master of Arts Degree in Counseling Psychology at Addis Ababa University. Therefore, you are kindly requested to give genuine responses to the questionnaire. Your responses have a crucial role in the success of this study. Your participation in this study will be completely voluntary. It will take 5-7 min to fully finish the questionnaire. The researcher will keep the confidentiality of the responses of the participants and the data will only be used for the academic use only.

General Directions:

- Please do not write your name on any part of the questionnaire.
- This questionnaire was filled with your own consent.

If you have any question and comments, don't hesitate to contact the researcher with address.

Email: *eyu.emamo@gmail.com* **Mobile No**: *+251912143708*

Thank you in advance for your cooperation!

Please confirm your consent with your signature _____

Depression, Anxiety and Stress Among People Living Chronic Hepatitis B

Part One: Demographic information

Direction: The following items require you to provide information about you. Please provide the information requested by circling for those items, which are followed by a list of options.

1) Gender: Male Female
2) Age: from 21 -30 from 31-40 from 41-50 51 and above
3) Follow up status: Taking medication Not taking medication

If you are not taking medication, please skip to question number 5.

4) Do you take your medication timely and properly: Yes No
5) Marital status: Single Married Divorced Widow
6) Education level: No formal education Elementary school

Secondary school College and above

7) Income status: Low Medium High
8) How many household lives in your family?

Live alone 2-5 6 and above

9) How many years since you know you have the virus?

8-12 years 13-17 years 18 and above

Part Two: Depression, Anxiety and Stress Scale

Please read each statement and putting (x) mark which indicates how much the statement applied to you. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0- Did not apply to me at all
1- Applied to me to some degree, or some of the time
2- Applied to me to a considerable degree or a good part of time
3- Applied to me very much or most of the time

1 (s)	I found it hard to wind down	0	1	2	3
2 (a)	I was aware of dryness of my mouth				
3 (d)	I couldn't seem to experience any positive feeling at all				
4 (a)	I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)				
5 (d)	I found it difficult to work up the initiative to do things				
6 (s)	I tended to over-react to situations				
7 (a)	I experienced trembling (e.g., in the hands)				
8 (s)	I felt that I was using a lot of nervous energy				
9 (a)	I was worried about situations in which I might panic and make a fool of myself				
10 (d)	I felt that I had nothing to look forward to				
11 (s)	I found myself getting agitated				
12 (s)	I found it difficult to relax				
13 (d)	I felt down-hearted and blue				
14 (s)	I was intolerant of anything that kept me from getting on with what I was doing				
15 (a)	I felt I was close to panic				
16 (d)	I was unable to become enthusiastic about anything				
17 (d)	I felt I wasn't worth much as a person				
18 (s)	I felt that I was rather touchy				
19 (a)	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)				
20 (a)	I felt scared without any good reason				
21 (d)	I felt that life was meaningless				

Appendix II: Amharic Version questionnaire

-

2

-

(Depression) (Axiety) (Stress)

21 (x)

5-7

-

-
-

eyu.emamo@gmail.com *+251912143708*

_____

Depression, Anxiety and Stress Among People Living Chronic Hepatitis B

1.

2. 21 -30 31-40

41-50 51

3.

“ 5 ”

3.1 / ?

4. : /

5. : (1-8)

(9-12)

6. :

7. ? 2-5 6

8.

8-12 13-17 18

:

0 1 2 3

(x)

0= 1= 2= 3=

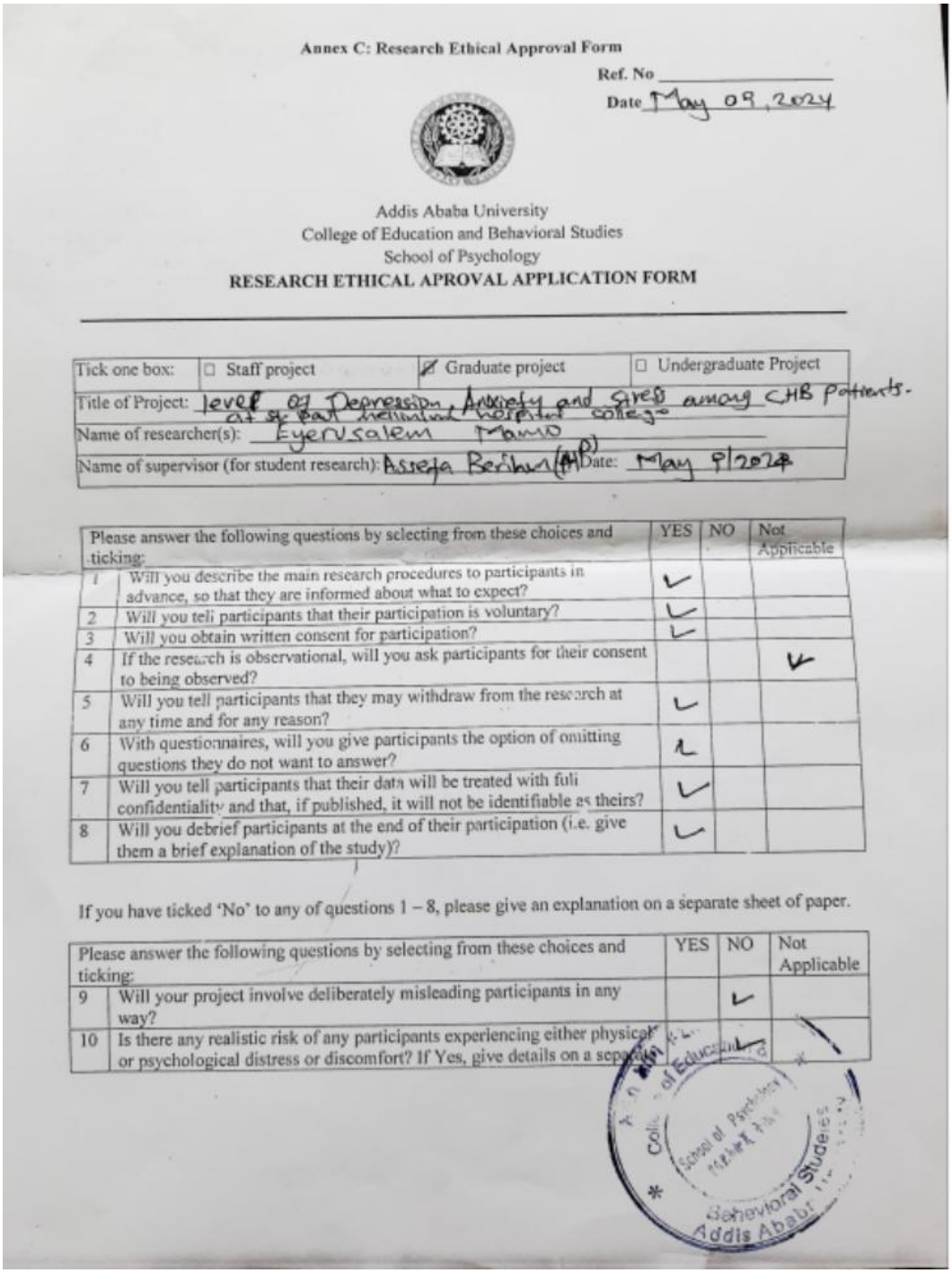
.		0	1	2	3
1 (s)					
2 (a)					

3 (d)					
4 (a)	( )				
5 (d)					
6 (s)					
7 (a)					
8 (s)					
9 (a)					
10 (d)					
11 (s)					
12 (s)					
13 (d)					
14 (s)					
15 (a)	/				
16 (d)					
17 (d)					
18 (s)					
19 (a)	- /				
20 (a)					
21 (d)					

Depression, Anxiety and Stress Among People Living Chronic Hepatitis B

Annex III: Ethical clearance certificate

A. Addis Ababa University's



Annex C: Research Ethical Approval Form

Ref. No _____

Date May 09, 2024

Addis Ababa University
College of Education and Behavioral Studies
School of Psychology
RESEARCH ETHICAL APROVAL APPLICATION FORM

Tick one box:	☐ Staff project	☑ Graduate project	☐ Undergraduate Project
Title of Project:	level of Depression, Anxiety and Stress among CHB Patients at St. Paul Millennium Medical college		
Name of researcher(s):	Eyerusalem Mamo		
Name of supervisor (for student research):	Asseja Berihun (MP)	Date:	May 9/2024

	Please answer the following questions by selecting from these choices and ticking:	YES	NO	Not Applicable
1	Will you describe the main research procedures to participants in advance, so that they are informed about what to expect?	✓		
2	Will you tell participants that their participation is voluntary?	✓		
3	Will you obtain written consent for participation?	✓		
4	If the research is observational, will you ask participants for their consent to being observed?			✓
5	Will you tell participants that they may withdraw from the research at any time and for any reason?	✓		
6	With questionnaires, will you give participants the option of omitting questions they do not want to answer?	✓		
7	Will you tell participants that their data will be treated with full confidentiality and that, if published, it will not be identifiable as theirs?	✓		
8	Will you debrief participants at the end of their participation (i.e. give them a brief explanation of the study)?	✓		

If you have ticked 'No' to any of questions 1 – 8, please give an explanation on a separate sheet of paper.

	Please answer the following questions by selecting from these choices and ticking:	YES	NO	Not Applicable
9	Will your project involve deliberately misleading participants in any way?		✓	
10	Is there any realistic risk of any participants experiencing either physical or psychological distress or discomfort? If Yes, give details on a separate		✓	

College of Education & Behavioral Studies
School of Psychology
Addis Ababa

Depression, Anxiety and Stress Among People Living Chronic Hepatitis B

Please answer the following questions by selecting from these choices and ticking:		YES	NO	Not Applicable
	sheet and state what you will tell them to do if they should experience any problems (e.g. who they can contact for help).		✓	

If you have ticked 'Yes' to questions 9 or 10, please give your justifications on a separate sheet of paper

Please answer the following questions by selecting from these choices and ticking:			YES	NO	Not Applicable
11	Do participants fall into any of the following special groups?	Schoolchildren (under 18 years of age)		✓	
		People with learning or communication difficulties			
		Patients	✓		
		People in custody		✓	
		People engaged in illegal activities (e.g. drug-taking, etc)		✓	

There is an obligation on the lead researcher to bring to the attention of the School Research Ethics Committee any issues with ethical implications not clearly covered by the above checklist.

I am familiar with the APA Guidelines for ethical practices in psychological research (and have discussed them with the other researchers involved in the project).

EYERUSALEM MAMO — May 09, 2024 — [signature]

Researcher (capital letters) — Date — Signature

ASSEFA BERIHUN (PhD) — May 09, 2024 — for S.W.T

Supervisor (capital letters: for students) — Signature

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OUTCOME OF ETHICAL APPROVAL APPLICATION

This research project has been considered using agreed Departmental procedures and is now

approved

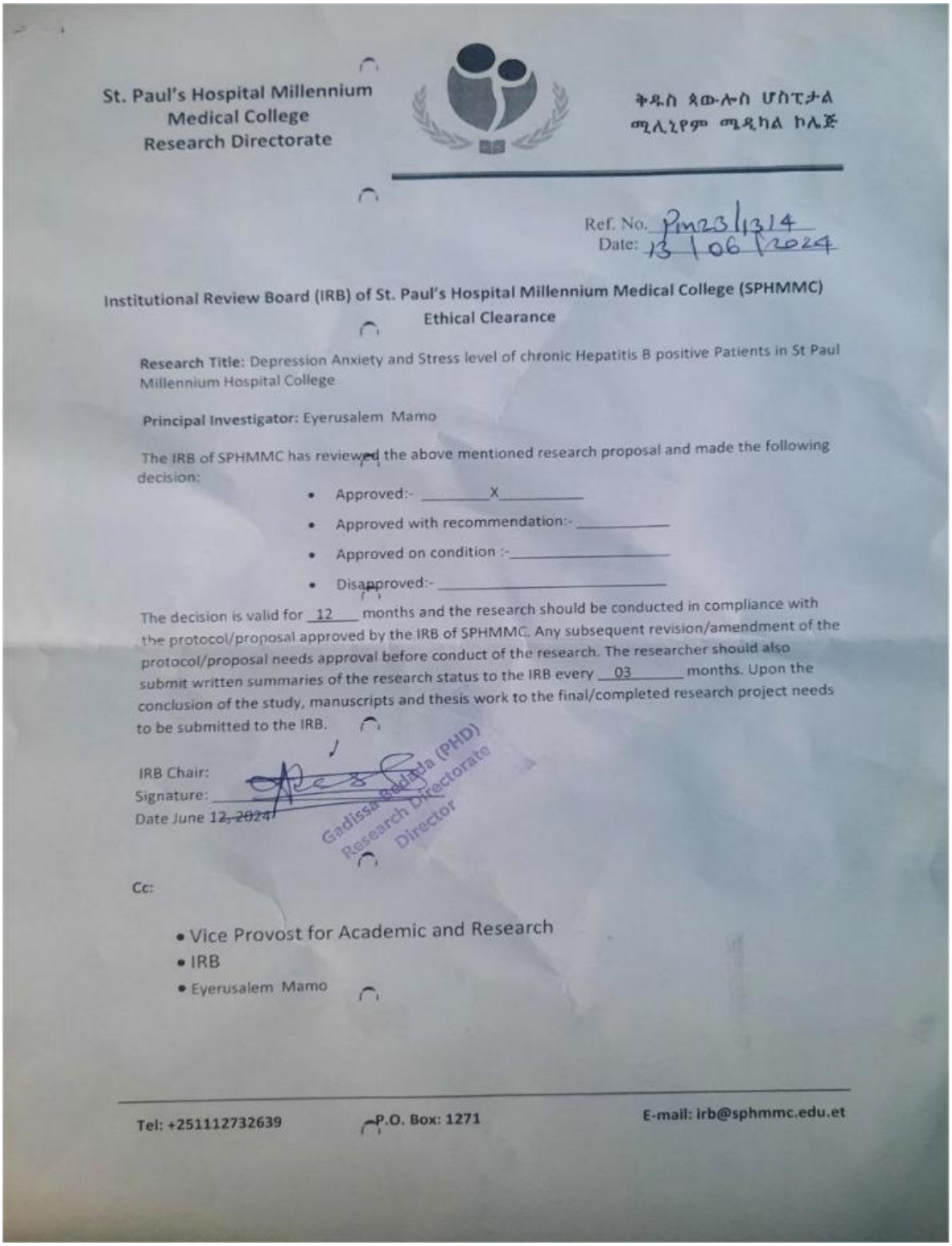
Abera Tibebu — May 24/2024 — [signature]

(Chair, Research Ethics Committee) — Date — Signature

College of Education & Behavioral Studies

Depression, Anxiety and Stress Among People Living Chronic Hepatitis B

B. St. Paul's Hospital Millennium Medical College (SPHMMC)



St. Paul's Hospital Millennium
Medical College
Research Directorate

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Ref. No. Pm23/1314
Date: 13/06/2024

Institutional Review Board (IRB) of St. Paul's Hospital Millennium Medical College (SPHMMC)
Ethical Clearance

Research Title: Depression Anxiety and Stress level of chronic Hepatitis B positive Patients in St Paul Millennium Hospital College

Principal Investigator: Eyerusalem Mamo

The IRB of SPHMMC has reviewed the above mentioned research proposal and made the following decision:

- Approved:- _____X_____
- Approved with recommendation:- _____
- Approved on condition :-_____
- Disapproved:- _____

The decision is valid for 12 months and the research should be conducted in compliance with the protocol/proposal approved by the IRB of SPHMMC. Any subsequent revision/amendment of the protocol/proposal needs approval before conduct of the research. The researcher should also submit written summaries of the research status to the IRB every 03 months. Upon the conclusion of the study, manuscripts and thesis work to the final/completed research project needs to be submitted to the IRB.

IRB Chair:
Signature: _____
Date June 12, 2024

Gadissa Addala (PHD)
Research Directorate
Director

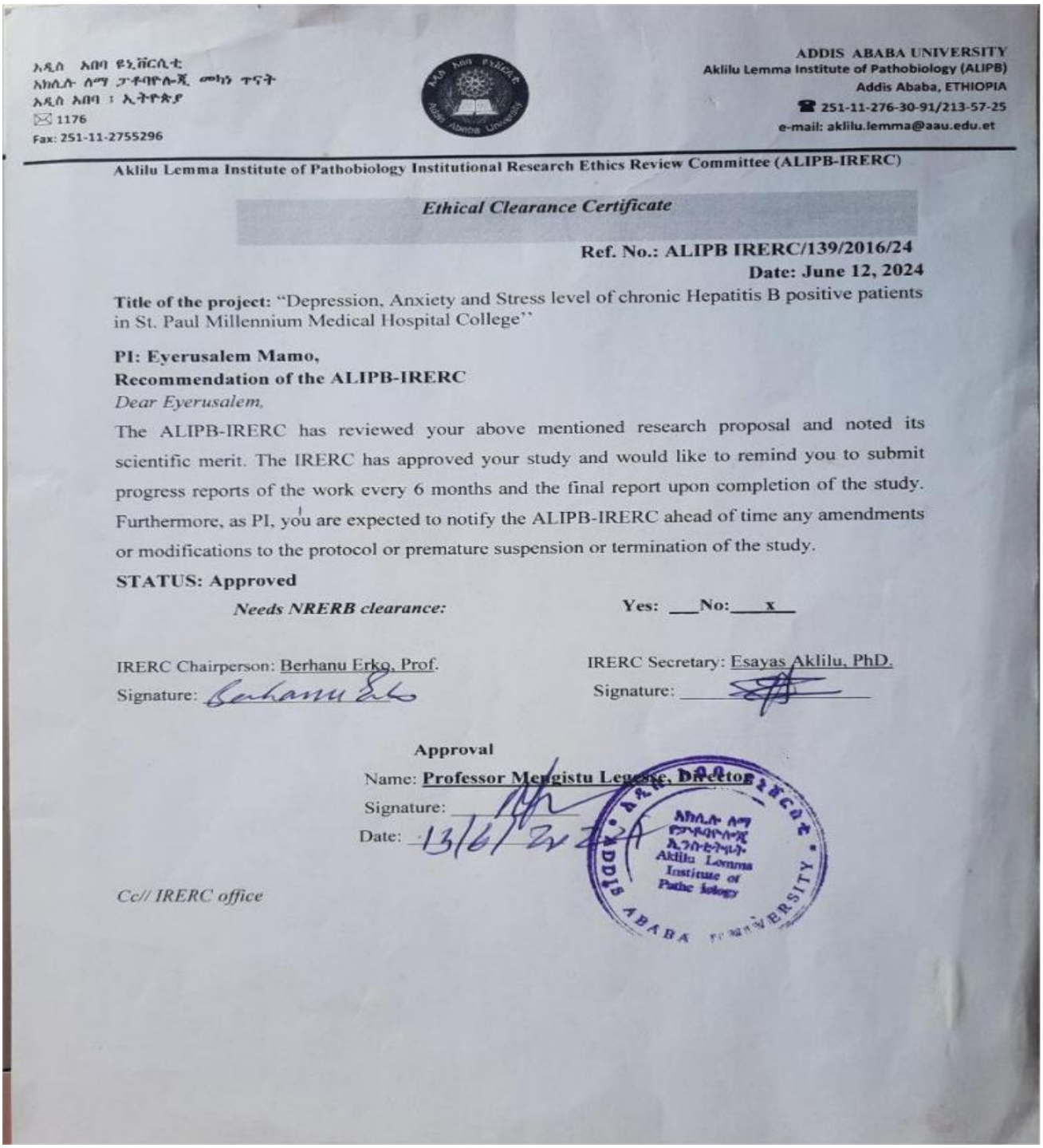
Cc:

- Vice Provost for Academic and Research
- IRB
- Eyerusalem Mamo

Tel: +251112732639 P.O. Box: 1271 E-mail: irb@sphmmc.edu.et

Depression, Anxiety and Stress Among People Living Chronic Hepatitis B

C. Aklilu Lemma Institute Pathobiology's (ALIPB)



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1176
Fax: 251-11-2755296

ADDIS ABABA UNIVERSITY
Aklilu Lemma Institute of Pathobiology (ALIPB)
Addis Ababa, ETHIOPIA
251-11-276-30-91/213-57-25
e-mail: aklilu.lemma@aau.edu.et

Aklilu Lemma Institute of Pathobiology Institutional Research Ethics Review Committee (ALIPB-IRERC)

Ethical Clearance Certificate

Ref. No.: ALIPB IRERC/139/2016/24
Date: June 12, 2024

Title of the project: "Depression, Anxiety and Stress level of chronic Hepatitis B positive patients in St. Paul Millennium Medical Hospital College''

PI: Eyerusalem Mamo,
Recommendation of the ALIPB-IRERC
Dear Eyerusalem,

The ALIPB-IRERC has reviewed your above mentioned research proposal and noted its scientific merit. The IRERC has approved your study and would like to remind you to submit progress reports of the work every 6 months and the final report upon completion of the study. Furthermore, as PI, you are expected to notify the ALIPB-IRERC ahead of time any amendments or modifications to the protocol or premature suspension or termination of the study.

STATUS: Approved

Needs NRERB clearance: **Yes: ___ No: _x_**

IRERC Chairperson: Berhanu Erko, Prof.
Signature:

IRERC Secretary: Esayas Aklilu, PhD.
Signature:

Approval
Name: **Professor Mengistu Legesse, Director**
Signature:
Date: 13/6/2024

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Cc// IRERC office

Depression, Anxiety and Stress Among People Living Chronic Hepatitis B

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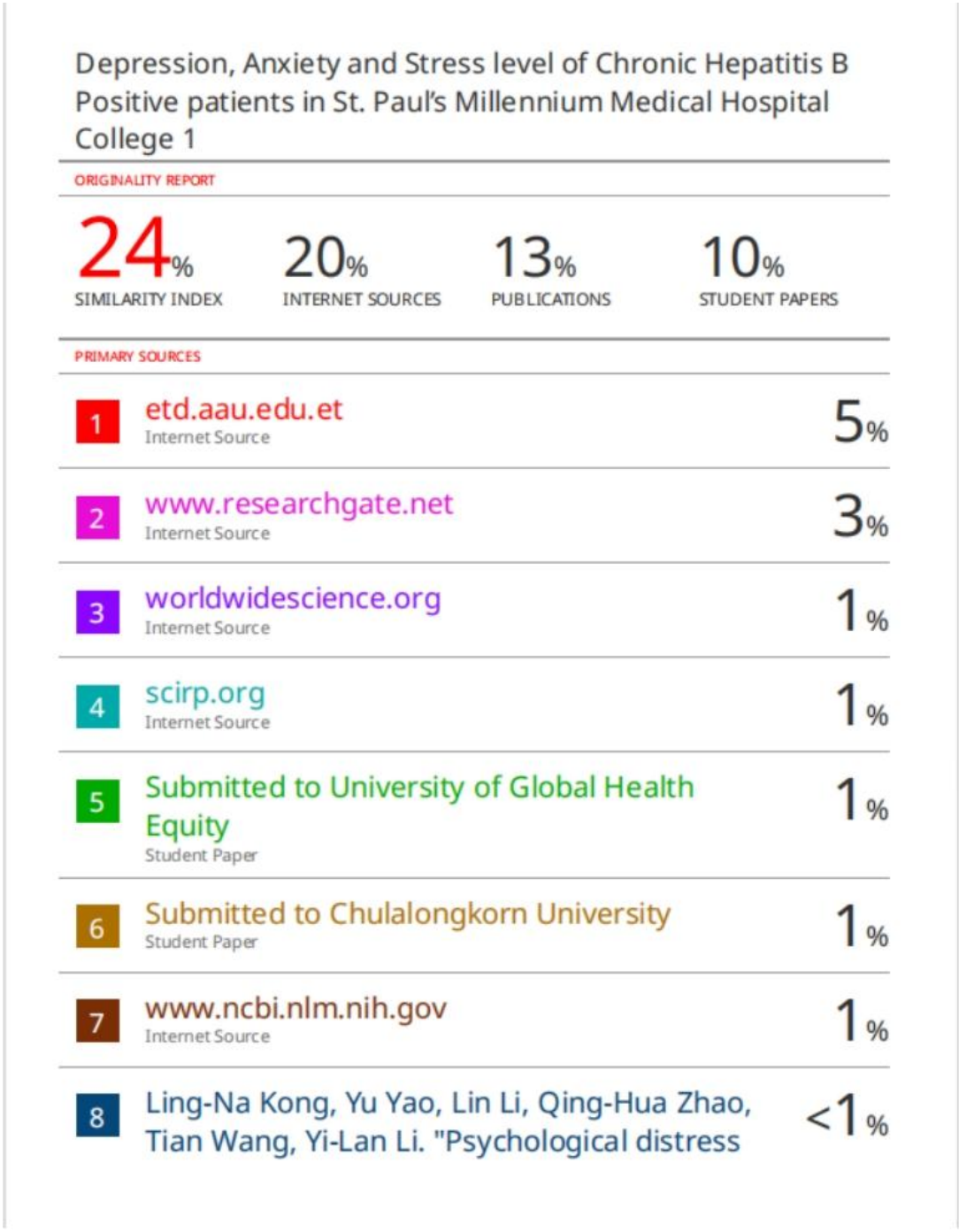

Depression, Anxiety and Stress level of Chronic Hepatitis B Positive patients in St. Paul's Millennium Medical Hospital College 1

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