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HEALTH-RELATED QUALITY OF LIFE OF PEOPLE WITH HEPATITIS B IN THE KUMASI METROPOLIS, GHANA.

BY

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DECLARATION

I declare that this research is my own original work. I have neither submitted any part nor the whole research to any other university for the award of any degree. All articles, books, published and unpublished resources used in this work have been duly acknowledged.

This study has been conducted with the supervision of Dr. Lillian Akorfa Ohene and Mr. Charles Ampong Adjei both in the School of Nursing and Midwifery, University of Ghana.

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ABSTRACT

Hepatitis B viral infection remains a public health threat worldwide. In Ghana, about 12.3% of the adult population live with hepatitis B. The significant impact of hepatitis B on affected individuals and society spanning social and psychological disturbances, economic constraints and mortality is widely reported. Also, a number of studies have documented the extent of knowledge of hepatitis B, psychological challenges faced by people with hepatitis B, and barriers to care and treatment for PWHB in Ghana. What appear to be missing in the literature is the health-related quality of life of people with hepatitis B in Ghana. The purpose of the study was to assess the quality of life of people with hepatitis B accessing formal care at the Komfo Anokye Teaching Hospital in the Kumasi Metropolis, Ghana by using the health-related quality of life model by Wilson and Cleary (1995) and revised by Ferrans, Zerwic, Wilbur, and Larson (2005). A cross-sectional survey was used to recruit 180 people with hepatitis B assessing formal care at the Komfo Anokye Teaching Hospital. Respondents were selected using convenience and quota sampling techniques. Statistical significance was set at .5. The findings indicate that about 75% of the respondent's quality of life was low. Explicitly, anxiety and depression negatively predicted quality of life but functional well-being and general health perceptions positively predicted the quality of life. Also, functional status and general health perceptions mediated the relationship between anxiety and quality of life. Environmental factors such as income, education and being on antiviral therapy for hepatitis B had major influence and explained 23.6% of the variation in quality of life. From the findings, it is recommended that support groups of people with hepatitis B are formed in the study area to enhance quality of life. Additionally, there is the need for pre-test and post-test counselling of people with hepatitis B in the health delivery system to allay the anxiety and depression that characterise hepatitis B diagnosis by integrating hepatitis B services with the existing HIV structures.

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ALT-	Alanine aminotransferase
DNA-	Deoxyribonucleic acid
FACIT-	Functional Assessment of Chronic Illness Therapy
FANLTC-	Functional Assessment of Non-Life-Threatening Conditions
GHSS-	Global Health Sector Strategy
HADS-	Hospital Anxiety and Depression Scale
HBsAg-	Hepatitis B surface antigen
HIV-	Human immunodeficiency virus
HRQOL-	Health-related quality of life
KATH-	Komfo Anokye Teaching Hospital
NHIS-	National Health Insurance Scheme
PROMIS-	Patient-Reported Outcomes Measurement Information System
PWHB-	People with Chronic hepatitis B
QOL-	Quality of life
SPSS-	Statistical Product and Service Solutions
SSA-	Sub-Saharan Africa
WHO -	World Health Organisation

CHAPTER ONE

INTRODUCTION

1.1 Background

Hepatitis B viral infection affects the lives of about 257 million people globally. A greater number of infected persons are in the world health organisation's (WHO) African region and the Western Pacific region (Jefferies, Rauff, Rashid, Lam, & Rafiq, 2018; World Health Organisation, 2020). In the year 2015, about 887,000 deaths were attributed to hepatitis B due to associated complications including cirrhosis of the liver and hepatocellular carcinoma (World Health Organisation, 2020).

The endemicity of hepatitis B has been classified as low (<2%), low-intermediate (2% to 4.9), high-intermediate (5 to 7.9%) and high (>8%) (Kim & Kim, 2018; Ott, Stevens, Groeger, & Wiersma, 2012). In areas with high endemicity, such as Africa (8.8%) and western pacific regions (5.3%) the main route of transmission is perinatal whiles in low endemic areas, including, the United States of America (<2%) hepatitis B is mainly transmitted through sexual contact (Kim & Kim, 2018). Other means of hepatitis B transmission includes percutaneous route, intravenous drug use, and blood transfusion (World Health Organisation, 2020)

Hepatitis B is mainly characterized in acute stages by yellowing of the skin and eyes (jaundice), dark urine, extreme fatigue, nausea, vomiting, and abdominal pain yet, most infected persons may not be aware of their status until testing is done (World Health Organisation, 2020). This is because the disease is mostly asymptomatic in the early stages (World Health Organisation, 2020). However, disease progression can occur in some people making them chronic and possibly causing complications (World Health Organisation, 2018). Early infection, below the age of 6 years leads to chronicity in about 95% of all such

cases whereas infection in adulthood rarely leads to chronic states except in about 5% of all such adults (World Health Organisation, 2020).

The economic burden of chronic hepatitis B can be overwhelming, affecting, affecting both friends and families (Deshpande et al., 2016; Nguyen et al., 2019; Zhang et al., 2016). For example, an annual direct expenditure of living with chronic hepatitis B accounted for 206.5% of an average patient's salary in China (Zhang et al., 2016). This may present a financial burden to people with hepatitis B (PWHB). Also, in the USA PWHB incurred 3 times more cost annually for healthcare than their non-hepatitis B controls who were either diabetic or hypertensive (Nguyen et al., 2019).

Apart from the cost implication of hepatitis B diagnosis, several psychological and social challenges exist for PWHB (Adjei, Naab, & Donkor, 2017; Adjei, Stutterheim, Naab, & Ruiter, 2019b; Li et al., 2018; Tu, Block, Wang, Cohen, & Douglas, 2020). PWHB lives daily in shock, shame, and disbelief and also with sadness, worry, and fear of the complications of the disease (Adjei et al., 2017). Others are afraid of becoming the source of infection to their families and friends (Adjei et al., 2017; Huang et al., 2016). Psychological symptoms may affect PWHB's ability to function at work and or sleep in the night (Simonetti et al., 2018). The impact of these challenges depends on some things. For instance, the stage of the disease, the degree of support from family and friends, the individual's personality, and their perception of the illness (Falvo & Holland, 2017). These challenges inevitably influence the health-related quality of life (HRQoL) of PWHB (Li et al., 2018; Simonetti et al., 2018). However, Tian and colleagues contend that changing the perception of PWHB by improving their knowledge of the disease could help improve their QoL (Tian, Zhang, Liu, Fangling, & Jia, 2017).

Also, certain characteristics of an individual such as age, sex, and marital status have been observed to influence the QoL of PWHB (Karacaer et al., 2016; Ngo et al., 2019;

Simonetti et al., 2018; Vu et al., 2019). For instance, females and older people may have a lower QoL than their male or younger counterparts respectively (Karacaer et al., 2016; Vu et al., 2019). Meanwhile, Ngo et al. (2019) found that being married seems to provide a significantly higher HRQoL than being single. Other scholars also reported that higher education, being employed and higher income have shown to have a positive influence on the QoL of PWHB (Ansari, Siddiqui, Malhotra, & Maaz, 2019; Balasundaram, Tiwari, TP, & Medicine, 2019; Vu et al., 2019)

The assessment of QoL was used earlier by the psychologists, sociologists and politicians (Haas, 1999; Mandzuk & McMillan, 2005). Interest in the concept of QoL in healthcare began in the 1960s and gained more relevance by the 1970s (Haas, 1999). The term 'health-related quality of life' (HRQoL) became more appropriate to distinguish general QoL indicators such as employment, income, education and housing from the impact a particular health status had on a person's QoL (Karimi & Brazier, 2016). QoL is a subjective multidimensional assessment of a person's life at a particular time. It covers the physical, social and psychological aspects of life. The WHO defines QoL as;

"An individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad-ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, and their relationships to salient features of the environment." (WHOQoL, 1993, p. 153).

The relevance of evaluating HRQoL has been proven to give a more holistic assessment of healthcare especially for people living with chronic illness than only biological and physical indicators (Al Qadire & Al Khalaileh, 2016; Karimi & Brazier, 2016; Wegner, Steidl, Pasqualoto, & Mancopes, 2018). Most often, it is unlikely for chronically ill patients to achieve a complete cure of sickness. Thus, having to live with a disease for a lifetime underscores the importance of knowing the determinants of QoL and

to create a means to improve the satisfaction of life of people living with chronic diseases (Adjei, Asamoah, Atibila, Ti-enkawol, & Ansah-Nyarko, 2016; (Karimi & Brazier, 2016)World Health Organisation, 2018).

Similarly, HRQoL assessment has generated recommendations for the modifications of the approach of care for PWHB (Khazem et al., 2018; Li et al., 2018; Simonetti et al., 2018). For instance, identifying psychological disturbances and intervening adequately was found to be a major lack in care and was recommended to enhance the HRQoL of PWHB in Italy. (Simonetti et al., 2018). Also, in Dalian China, depression was found to affect the HRQoL of PWHB and psychological interventions were recommended to be included in routine care (Li et al., 2018).

Again, in May 2016, the World Health Assembly approved the Global Health Sector Strategy (GHSS) on viral hepatitis. The GHSS aims for the elimination of viral hepatitis as a threat to the health of the public by 2030 (World Health Organisation, 2016). The objective is to decrease new infections by 90% and decrease death rates by 65% (World Health Organisation, 2016). In efforts to achieve this, the World Health Organisation (2016)in their global hepatitis report noted several high-impact public health interventions that have been put in place to curb the outspread of viral hepatitis by 2030. Activities such as the timely immunization of all newborn babies, the inclusion of hepatitis B vaccine in routine infant immunization, the immunization of adults after testing negative to the hepatitis B surface antigen (HBsAg), and the availability of medications for the treatment and control of viral hepatitis were adopted. Likewise, the sustainable development goal target 3.3 also seeks to combat hepatitis by the end of the year 2030 (World Health Organization, 2016). The Ghanaian health system has adopted some of these interventions to help eliminate hepatitis in the country (Ghana Health Service, 2017). Hepatitis B vaccines have been included in the routine infant immunization, free screening for health workers, compulsory screening

for all blood before transfusion, and testing with available vaccines' and treatment at a cost (Ghana Health Service, 2017).

Although the influence of chronic hepatitis B on HRQoL is well established (Ngo et al., 2019; Xue, Cai, Ou, Zheng, & Wu, 2017; Z. M. Younossi, Stepanova, Younossi, Pan, et al., 2019) different populations have produced dissimilar results. Therefore, it is imperative to know the QoL of the PWHB in Ghana to help optimize their care. The study seeks to find the individual's assessment of QoL as they live with chronic hepatitis B in the Kumasi metropolis of the Ashanti region, Ghana. The revised Wilson and Cleary (1995) HRQoL model by Ferrans et al. (2005) was the organizing framework for the study.

1.2 Statement of the problem

Hepatitis B is a public health threat in Ghana (Adoba et al., 2015; Osei, Lokpo, & Agboli, 2017) with a national prevalence rate of 12.3% (Ofori-Asenso & Agyeman, 2016). The age groups of 16 to 39 years had the highest prevalence rate nationwide. The Ashanti region (that is the study area) had the third-highest regional prevalence of 13.1%, higher than the national prevalence rate (Ofori-Asenso & Agyeman, 2016).

Despite the high prevalence of hepatitis B in Ghana, the majority of Ghanaians do not have enough information on hepatitis B (Abdulai, Baiden, Adjei, & Owusu-Agyei, 2016; Adade, 2016; Adoba et al., 2015; Afihene, Duduyemi, Hannah-Lisa, & Khatib, 2017). For example, pregnant women in Kintampo north municipal were found to have low knowledge of the causes, transmission and prevention of hepatitis B (Abdulai et al., 2016). Healthcare providers have also been found to have inadequate knowledge on the transmission of hepatitis B (Afihene et al., 2017). This could partly explain the stigmatizing reactions expressed towards PWHB in Ghana (Adjei et al., 2017; Adjei et al., 2019b).

Evidence of psychosocial disturbances such as worry, fear, sadness, depression, anxiety and stigma has been established among PWHB in Ghana (Adjei et al., 2017; Adjei et al.,

2019b). The lack of knowledge of hepatitis B which leads to its poor perception of the cause and mode of transmission promotes these psychosocial symptoms among PWHB in Ghana (Adjei et al., 2019b). PWHB fear reactions from friends, family, and the general public as the disease is believed to be a punishment from the gods for evildoers (Adjei et al., 2019b).

Further, the cost of treatment for hepatitis B is high for the average Ghanaian (Ofori-Asenso & Agyeman, 2016). Researchers have advocated for the inclusion of hepatitis B treatment in the national health insurance scheme (NHIS) (Adams, 2017; Adjei, Stutterheim, Naab, & Ruiter, 2019a) however, this is yet to be realized. Contentiously, the aforementioned challenges may have an influence on the overall QoL of PWHB in Ghana. Thus, this study sought to assess the QoL of PWHB.

Studies on hepatitis B in Ghana have mainly focussed on its prevalence, knowledge, and challenges (Abdulai et al., 2016; Adade, 2016; Adjei et al., 2017; Adoba et al., 2015; Afihene et al., 2017; Ofori-Asenso & Agyeman, 2016). Understanding the QoL of PWHB will help in the design of a culturally appropriate intervention that can improve the care and support of PWHB.

1.3 Purpose of the study

The purpose of this study is to assess the HRQoL of PWHB in the Kumasi Metropolis.

1.4 The research objectives

1. To examine the associations between psychological symptoms, functional well-being, general health perception, and HRQoL of PWHB.
2. To investigate the direct prediction of HRQoL by depression, anxiety, functional well-being, and general health perception of PWHB.
3. To determine the prediction of functional well-being by anxiety and depression of the PWHB.

4. To determine the prediction of general health perception by functional well-being of the PWHB.
5. To examine the indirect effect of depression and anxiety on the HRQoL of PWHB through functional well-being and general health perception.

1.5 Research Questions

2. What are the associations between psychological symptoms, functional well-being, general health perception. and HRQoL of PWHB?
3. What is the direct prediction of HRQoL by depression, anxiety, functional well-being and general health perception of PWHB?
4. What is the direct prediction of functional well-being by anxiety and depression of the PWHB?
5. What is the prediction of general health perception by the functional well-being of the PWHB?
6. What is the indirect effect of depression and anxiety on the HRQoL of PWHB through functional well-being and general health perception?

1.6 The significance of the study

HRQoL assessment is of utmost importance to a patient with a chronic disease and healthcare providers. It allows the patient to subjectively assess the influence of the disease and treatment on every aspect of life and enables healthcare providers to assess treatment and modify outcomes to improve the QoL of patients (Karimi & Brazier, 2016).

- This study uses a validated disease-specific tool, the hepatitis B HRQoL instrument version 1.0 (Spiegel et al., 2007). The findings will be a more accurate reflection of the QoL of the PWHB.
- Findings from the study will fill the gap in literature about the assessment of the HRQoL of PWHB in Ghana.

- The study findings will form the baseline for clinicians in assessing services given to PWHB in Ghana. Patient's perception of how the disease affects the quality of their lives will enable caregivers to identify areas to modify care.
- The findings will inform policymakers of the areas to support PWHB. That is, healthcare resources will be allocated to areas that patients would find beneficial.
- The study findings will inform the development of educational programs that can specifically target families and friends of PWHB on the realities facing PWHB which may in turn help individuals to properly support relatives/friends who live with hepatitis B.

1.7 Operational definition

PWHB - patients who have tested positive for hepatitis B surface antigen (HBsAg) for more than six months.

Overall QoL / HRQoL / QoL (Ferrans et al., 2005) – the assessment of the general satisfaction of life as a person lives with hepatitis B.

Individual characteristics (Ferrans et al., 2005)- the demographic characteristics of an individual example the age, sex and marital status.

Environmental characteristics (Ferrans et al., 2005)- refer to the socio-economic characteristics of a person with chronic hepatitis B such as income employment, education and being on or off antiviral therapy for hepatitis B.

Functional status / functional well-being (Ferrans et al., 2005) – the functioning assessment of a person living with chronic hepatitis B.

General health perception (Ferrans et al., 2005)– a person's general health rating.

CHAPTER TWO

LITERATURE REVIEW

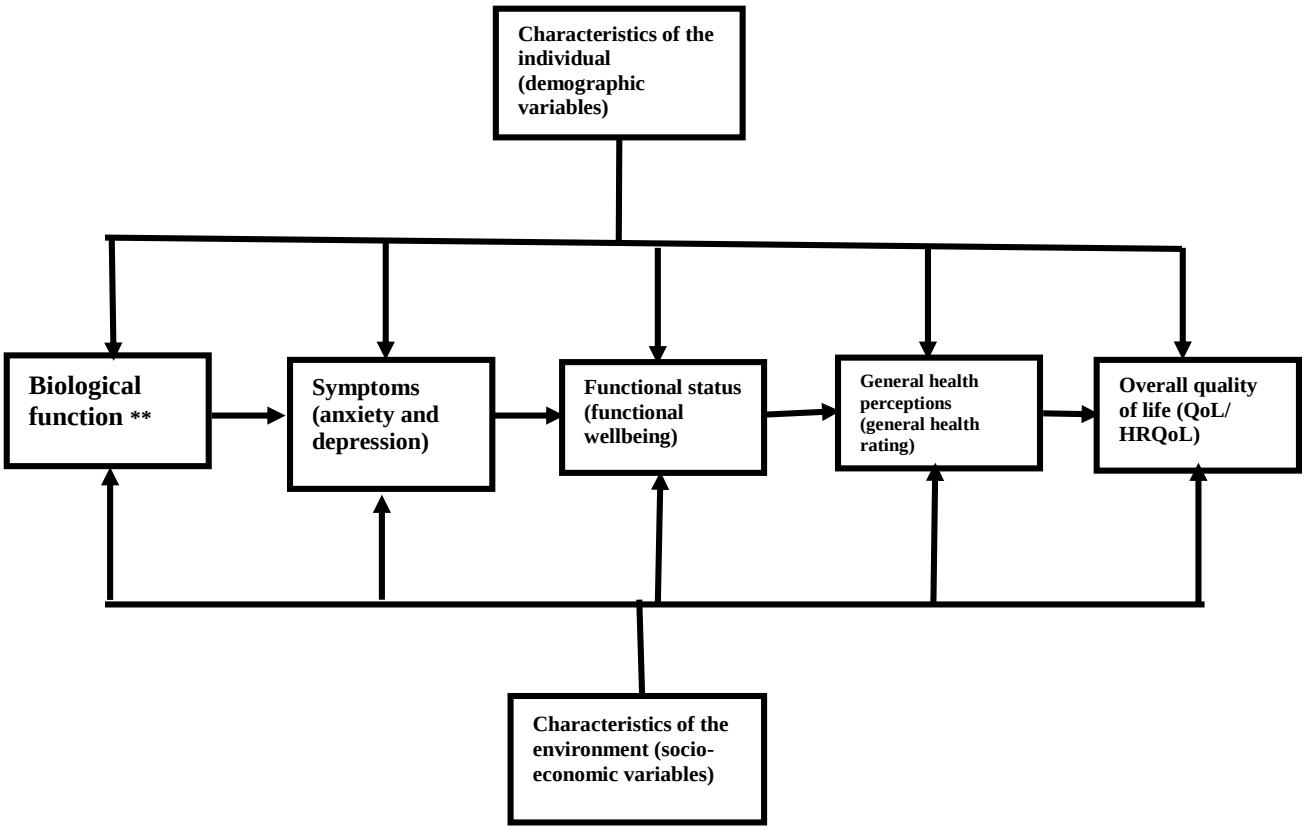
2.0 Introduction

In this chapter, the framework that guided the study, and relevant literature on the QoL of PWHB was reviewed.

2.1 The revised version of the Wilson and Cleary (1995) HRQoL model by Ferrans et al. (2005)

The HRQoL model by Wilson and Cleary (1995) revised by Ferrans et al. (2005) guided the research. The model has been used to study the QoL of patients living with varied chronic illnesses (Djukic, Racic, Mijovic, & Ivkovic, 2018; Y. Kim & Park, 2018; S. Y. Lee & Kim, 2018; Machón, Larrañaga, Dorronsoro, Vrotsou, & Vergara, 2017; Rebelo, Cardoso, Robinson, & Vettore, 2016) For example, Djukie and colleagues applied the model in studying the HRQoL of outpatients with chronic heart failure (Djukic et al., 2018) whereas S. Y. Lee and Kim (2018) were guided by the model in a structural equation modeling on HRQoL among patients with thyroid cancer in New York and Korea respectively.

The model directs that five patient health outcomes have a linear dominant causal relationship (Ferrans et al., 2005; Wilson & Cleary, 1995). The authors admitted that there may be a possible reverse relationship between the health outcomes but were not considered in this model because only dominant relationships were assessed (Ferrans et al., 2005). The outcomes namely, biological function, symptoms, functional status, general health perceptions, and the HRQoL are influenced by the characteristics of the individual and the environment (Ferrans et al., 2005).



**This part of the model will not be studied.

Figure 1 : The revised version of the HRQoL model of Wilson and Cleary (1995) by Ferrans et al. (2005).
Source: Adopted from Ferrans et al. (2005).

2.1.1 Characteristics of the individual in the model

According to Ferrans et al. (2005), an individual's characteristics consist of those demographic and intrapersonal factors such as biological, psychological, and developmental features. Health outcomes in the model are influenced by the individual's characteristics. Demographic factors including age, sex, marital status, and ethnicity have often been linked to the incidence of diseases (Frigerio et al., 2019; Ramke et al., 2019; Rea et al., 2018). As in the case of age and sex for Alzheimer's disease (Frigerio et al., 2019). Even though these factors are not modifiable (Ferrans et al., 2005), they aid in the identification of target groups for medical interventions. Biological factors like skin color, body mass index, and family genetic history also predispose individuals to various diseases (Khazem et al., 2018; Liebau

& Schmidts, 2018). For example, genetics is said to play a role in childhood kidney diseases (Liebau & Schmidts, 2018).

An individual's developmental stage explains to a large extent their health-seeking behavior (Ferrans et al., 2005). Health interventions should consider developmental stages and modify approaches when they target behavior change. Psychological factors which include intellectual judgements, emotional response, and motivation towards the effects of the disease can be altered or improved in an individual (Ferrans et al., 2005). The demographic items on the study instrument represented the individual's characteristics in this study.

2.1.2 Characteristics of the environment in the model

The characteristics of the environment that affect health outcomes and the QoL of an individual is categorized into two: the social and the physical environment (Ferrans et al., 2005). The social environment consists of the influence of a person's interpersonal relationships on the outcome of health (A. A. Lee, Piette, Heisler, & Rosland, 2018; Watson, Grossman, & Russell, 2019). For instance, the influence of friends, family, education, employment, and income on the health-seeking behavior of a person (DeBate, Gatto, & Rafal, 2018). The physical environment comprised of the state of the environment that may influence a person's health outcome. Hence the physical condition in a person's home, neighborhood, and workplace. Conditions such as portable water, air, and land pollution, ventilation and drought have influences on the health of individuals (Koren & Bisesi, 2016; Zock et al., 2018). Socio-economic variables such as income, educational level, and employment status represented the environmental characteristics in this work as was done in the work of Hays et al. (2000).

2.1.3 Biological function in the model

The function of the whole body from cells to organs is considered as the biological function of the individual. Ferrans et al. (2005), noted biological function to be in a range. From the perfect possible function of the body to a deadly pathology on the other side. In the model, biological function is seen to affect symptoms, functional status, general health perceptions, and ultimately the HRQoL of a person. Biological function is influenced by the characteristics of the individual and the environment. Originally known as biological and physiological factors (Wilson & Cleary, 1995), the construct is measured by laboratory tests and physical examination of the individual. No aspect of this construct will be measured. The sample is a specific group from the population of PWHB and may not exhibit much variance in the biological function.

2.1.4 Symptoms in the model

Wilson and Cleary (1995, p. 61) defined symptoms as 'a patient's perception of an abnormal physical, emotional or cognitive state'. The focus on cells or organs in biological function is redirected to the person as a whole. The complex influence of biological function on symptoms is not always explained. From the model, a change in biological function suggest an effect in the symptoms of an individual however, this is always not the case. There are instances where individuals' may have no symptoms at all even though gross changes may be occurring in their cells and organ function (Wilson & Cleary, 1995). An example of such instance is when a person becomes chronically infected with the hepatitis B, they may show no physical or emotional symptoms at all until complications set in or they become aware of their hepatitis B positive status (World Health Organisation, 2018). There is also the case where individuals tend to show both physical and or psychological symptoms without any obvious change in the biological function. This is typical in some

mental illnesses. Symptoms are affected by the characteristics of the individual and the environment.

In this study, depression and anxiety which is mostly dominant among the symptoms that PWHB experience (Simonetti et al., 2018) was measured using the hospital anxiety and depression scale (HADS) (Zigmond & Snaith, 1983).

2.1.5 Functional status in the model

Ferrans et al. (2005), defined functional status as a person's ability not only to perform certain functions but also to optimise the rest of the capacity left after an illness in a couple of domains. The domains comprise physical, social, cognitive, and role functions. From the model, a person's ability to perform tasks are influenced by the biological function and symptoms the individual may be exhibiting after an illness. Nevertheless, that alone cannot account for a decrease in performing functions as individual characteristics such as motivation, values, and choices plus environmental factors such as the support a person receives from others may influence this ability (Ferrans et al., 2005).'

Functional status was assessed by the functional well-being subscale from the functional assessment of non-life-threatening conditions (FANLTC) instrument in the Functional Assessment of Chronic Illness Therapy (FACIT) group of questionnaires (Cella et al., 1993).

2.1.6 General health perceptions in the model

The assessment of general health perceptions is subjective and involves all the health outcomes that precedes it in the model (Evon et al., 2020; Ferrans et al., 2005; Ngo et al., 2019; Wilson & Cleary, 1995). However, the authors emphasized that it would be wrong to use any aspect of the other health outcomes to evaluate general health perceptions. A single item (Hays, Spritzer, Thompson, & David, 2015) asking respondents to rate their health

status or a group of items that asks a person to rate aspects of their health is more appropriate (Ferrans et al., 2005; Wilson & Cleary, 1995).

The single item, 'the excellent to poor' self-rated health item (Hays et al., 2015) was used for PWHB to rate their health in this study.

2.1.7 Health-related quality of life in the model

Wilson and Cleary (1995) explained the overall QoL to be a person's general satisfaction or happiness in life after an illness. All the outcomes of health in the model affect how a person assesses satisfaction of life. According to the model, overall QoL is also influenced by the individual and the environmental characteristics. Factors such as a person's preference and values affect how they rate their satisfaction of life (Ferrans et al., 2005). People may change their expectations, alter values or preferences after encountering a disease. Hence a significantly lowered functional status may not necessarily mean a lowered rating of one's QoL (Wilson & Cleary, 1995). The hepatitis B HRQoL instrument version 1.0 measured the HRQoL of PWHB in this work.

2.2 Relevance and justification for the use of the revised version of the Wilson and Cleary (1995) HRQoL model by Ferrans et al. (2005)

The model was considered alongside two other QoL models namely the QoL model for cancer survivors by Ferrell, Grant, Padilla, Vemuri, and Rhiner (1991) and the response shift HRQoL model proposed by Sprangers and Schwartz (1999).

The QoL model proposed by Ferrell et al. (1991) describes four domains namely physical, psychological, social, and spiritual well-being that affect the life's of cancer survivors. Due to the broad nature of the model, it may be difficult to appreciate the direct influence of chronic hepatitis B on all the aspects of life that influence a person's QoL. For example, in the physical domain there are aspects of symptoms, individual characteristics, and functional status that may affect the QoL of PWHB.

The response shift HRQoL model by Sprangers and Schwartz (1999) proposes four components that may affect a person's perceived QoL. The catalyst, antecedents, mechanisms, and response shift. The catalyst refers to the change in the health of a respondent through antecedents which can be referred to as the characteristics of the individual. A person then goes through mechanisms of adaptation to be able to accommodate the change in health. This may result in a change in a person's standards or values in life denoting a response shift in the evaluation or assessment of QoL. This model assesses the process a person goes through after encountering an illness to adapt to one's new health status. This adaptation may affect the evaluation of an individual's present HRQoL. Adaptation was not the objective of this study.

The revised version of the HRQoL model of Wilson and Cleary (1995) by Ferrans et al. (2005) was carefully chosen to guide the study as the model explains the causal effects of health outcomes with empirical evidence. The revised HRQoL model by Ferrans et al. (2005) is simple and comprehensible. The model particularly works well in determining the predictors of the overall QoL of people living with chronic diseases (Bakas et al., 2012).

2.3 The quality of life concept

According to Miguel et al. (2016, pp. 346, 347), QoL is "recognized as a concept representing individual responses to the physical, mental, and social effects of illness on daily living, which influence the extent to which personal satisfaction with life circumstances can be achieved". Other concepts noted to be embedded in QoL are life satisfaction, well-being, comfort, and happiness. These concepts are often used interchangeably with QoL (Keyes & Ryff, 1999; Pinto, Fumincelli, Mazzo, Caldeira, & Martins, 2017)

A review of the literature reveals several characteristics of the concept of QoL. Paramount and present in almost all the literature is the fact that QoL is multidimensional

(Mandzuk & McMillan, 2005; Moons, Budts, & De Gest, 2006; Plummer & Molzahn, 2009; Taylor, Gibson, & Franck, 2008). This means the concept is broad and has several measurements to its meaning. QoL is said to cover the physical, mental/psychological, and social well-being of an individual (WHOQoL, 1993). Some people have also debated that QoL is a unidimensional concept with several backgrounds (Beckie & Hayduk, 1997; Megari, 2013; Moons et al., 2006). The argument that QoL has several backgrounds validates the fact that there is an element of heterogeneity in the concept. QoL is also said to cover all aspects of life, hence assesses the physical, mental, and social aspects of an individual.

The second characteristic observed is the subjective and objective nature of QoL. From the sociology, psychology, economic, and political fields, an objective assessment of a peoples' QoL is very important to make national decisions (Diener & Suh, 1997; Ferriss, 2004; Keyes & Ryff, 1999). The non-health professionals argued the 'good of a people' (QoL) cannot be decided upon by the subjective preferences of individuals.

A subjective assessment on the contrary is key to evaluating a person's QoL in healthcare. Different people may experience the same ailment differently hence the effects of a disease and its treatment on lives can best be described only by the individuals experiencing the disease (Moons et al., 2006; Muldoon, Barger, Flory, & Manuck, 1998). Pinto et al. (2017) in their discussion of the differences and similarities among the concepts comfort, well-being, and QoL concluded that, the element of a subjective assessment is crucial and present in all the three concepts.

Another characteristic of QoL is that the concept ranges from a low to a high level in an individual's life. A person's QoL may be high or low reliant on the focus of the evaluation and the indicators of QoL at any given time (Mandzuk & McMillan, 2005). For

example, a person's evaluation of QoL based on physical function may be quite different from the same person's evaluation based on role or emotional function,

Also, QoL is not static, it is ever-changing depending on the stage and the progression of illness, phase of treatment of the illness, and the support systems of the individual. (Megari, 2013). Therefore, the attainment of a low or a high QoL at any given point in time is not permanent. This allows for modifications and or maintenance of practices that improve people's QoL if it is low or high respectively.

2.4 Overview of chronic hepatitis B

The hepatitis B virus attacks the liver and can cause acute and chronic infections (World Health Organisation, 2019). A person is said to have an acute infection when the hepatitis B virus is first detected in the blood for six months (Franciscus, 2019). The incubation period for the hepatitis B virus is about 60 days on average. Most people would not experience any symptoms during this time however, some people would experience nausea, yellowing of the eyes, fatigue, abdominal pains vomiting, and dark colored urine in extreme forms (World Health Organisation, 2019). About 90 to 95% of adults who are immunocompetent would naturally clear the virus within the first six months of infection yet, 5 to 10% of adults maintain the risk for chronicity. That is the persistence of the hepatitis B surface antigen for more than 6 months (Franciscus, 2019; Shi & Shi, 2009; Terrault et al., 2018; Yim & Lok, 2006). The reverse is the case for those who acquire the infection perinatally and below the age of 6. The protective antibodies that a person produces during the time of fighting the hepatitis B virus, may protect them from further infection from hepatitis B (Franciscus, 2019; Shi & Shi, 2009; Yim & Lok, 2006).

Chronicity of hepatitis B occurs in four phases. Namely, the Immune-Tolerant Phase, HBeAg-Positive Immune-Active / immune clearance phase, Inactive Chronic Hepatitis B Phase, and the HBeAg-Negative Immune Reactivation Phase (Shi & Shi, 2009; Tang,

Covert, Wilson, & Kottilil, 2018; Terrault et al., 2018; Yim & Lok, 2006). The number and duration of phases vary among individuals and depends on the immune system and the age of infection.

2.4.1 The Immune-Tolerant Phase

The hepatitis b virus multiplies quickly at this stage yet causes minimal inflammation to the liver. This phase lasts about 1 to 4 decades but is short-lived for those who acquired the infection perinatally (Yim & Lok, 2006). Significant of this phase are Normal liver enzymes (alanine aminotransferase- ALT), hepatitis B viral deoxyribonucleic acid (DNA) (viral load) > 1 million IU/ml, positive hepatitis B e antigen (HBeAg), minimal liver inflammation, and minimal liver fibrosis.

2.4.2 HBeAg-Positive Immune-Active /Immune clearance phase

In this phase, the hepatitis B virus affects the liver and causes significant inflammation and some level of fibrosis. Infected persons begin to develop antibodies, anti-HBe, and losses the HBeAg. This process is called seroconversion and marks the beginning of the inactive phase of the chronic hepatitis B (Shi & Shi, 2009).

2.4.3 Inactive Chronic Hepatitis B Phase

In this phase also known as the inactive carrier stage, there is an increased amount of the antibodies, anti-HBe, a negative HBeAg, and hepatitis B viral DNA may be undetectable. There is minimal liver inflammation and the fibrosis level depends on the level attained in the previous stages. About 80% of PWHB may remain in this phase however there is a reactivation of the hepatitis B viral replication in some people (Franciscus, 2019; Yim & Lok, 2006).

2.4.4 HBeAg-Negative Immune Reactivation Phase

Hepatitis B viral replication may occur naturally or as a result of a compromised immune system (Terrault et al., 2018; Yim & Lok, 2006). Typical of this phase are elevated

ALT, hepatitis B viral DNA (viral load) ≥ 2,000 IU/ml, negative HBeAg, moderate to severe liver inflammation, and moderate to severe liver fibrosis (Franciscus, 2019).

The risk of developing cirrhosis or liver cancer increases with age (above 40years), the male sex, additional viral infections such as hepatitis C, D or human immunodeficiency virus (HIV), consumption of alcohol, and other immunosuppressant conditions (Franciscus, 2019). A spontaneous clearing of the hepatitis B surface antigen (HBsAg), the development of the antibodies (anti-HBs), and low or undetectable levels of the hepatitis B viral DNA occurs in about 0.5% to 2% of all PWHB annually even in the absence of treatment. This loss of chronicity is referred to as an immunologic cure (Tang et al., 2018).

2.5 Review of the HRQoL of PWHB

Empirical literature that is related to the HRQoL of PWHB is reviewed in this section. Databases such as PubMed, ScienceDirect, SAGE, Google Scholar, EBSCOhost, MEDLINE, and Wiley Online Library were used for the search. Keywords and phrases such as HRQoL, symptoms, hepatitis B, functional status, general health perceptions, individual, and environmental characteristics were used for the search. The outline of the literature review was organized by the guiding framework of the study.

2.5.1 Psychological symptoms (depression and anxiety) of PWHB

People infected with chronic hepatitis B are mostly asymptomatic until the hepatitis B infection reaches the advance stage where they show physical symptoms or get to know their positive status through routine laboratory examination (World Health Organisation, 2019). However, as soon as a hepatitis B positive status is known, individuals react psychologically by experiencing shock, shame, disbelief, sadness, worry, and fear (Adjei et al., 2017; World Health Organisation, 2019). When these psychological reactions are not controlled, psychological challenges may progress into symptoms of depression and anxiety (Balasundaram et al., 2019; Liu, Tang, Long, & Zhao, 2017). (Zhu et al., 2016).

Depression and anxiety have been detected in chronic hepatitis B infection worldwide (Balasundaram et al., 2019; Fındıklı et al., 2017; Karlidağ & Atmaca, 2019; Liu et al., 2017; M. Liu et al., 2017; Simonetti et al., 2018; Xue et al., 2017) and noted to be one of the sturdiest predictors of HRQoL of PWHB (Li et al., 2018; M. Liu et al., 2017; Ngo et al., 2019). For example, in the work of M. Liu et al. (2017), major depression in the chronic hepatitis B population was about 4.8% higher than in the Chinese general population. Also, in the work of Simonetti et al. (2018) anxiety proved to be the only independent predictor of altered HRQoL in a multivariate analysis.

The likelihood of experiencing depression has been found to be higher in less educated individuals than those with at least secondary education or higher (Balasundaram et al., 2019; Karlidağ & Atmaca, 2019). The work of Balasundaram et al. (2019) revealed that viral hepatitis patients who had no education were 77 *percent* more likely to experience depression than those who had secondary education or above. However, it has been documented that PWHB from Korea with higher education have a compromised HRQoL (Kim, Han, Lee, & Park, 2015).

Also, the severity of depression and anxiety in chronic hepatitis B has been closely linked to the severity of the infection and the presence of complications (Evon et al., 2020; Yilmaz et al., 2016; Zhu et al., 2016). As a result, PWHB with no physical symptoms nor complications may not be likely to experience severe depression nor anxiety (Evon et al., 2020). Anxieties of PWHB may be heightened due to the uncertainties of the prognosis and the infectious nature of the disease (Hajarizadeh, Richmond, Ngo, Lucke, & Wallace, 2016).

Unlike physical symptoms that improve with antiviral therapy (Cimolai, 2019; Xue et al., 2017), Xue et al. (2017) detected no significant difference in psychological status including depression and anxiety before and after antiviral therapy. Contrarily, Karlidağ and Atmaca (2019) detected lower scores of depression and anxiety in the antiviral treatment

group giving possible interpretation as the effect of antiviral therapy but also encourages further research into this finding.

Adjei et al. (2017) found several psychosocial stresses among PWHB in Ghana. Even though the study informs the presence of psychological challenges in the Ghanaian population of the PWHB, the study used a qualitative approach and therefore makes it difficult to quantify the density of these challenges in Ghana. A quantitative method may be more advantageous in future research for this purpose. Psychological symptoms may affect the ability to function (Evon et al., 2016; Ferrans et al., 2005; Wilson & Cleary, 1995). Fatigue that interrupts functioning was detected to increase with poorer mental health among PWHB in North America (Evon et al., 2016).

2.5.2 Functional status of PWHB

According to Ferrans et al. (2005), the manifestation of a disease in the form of symptoms influences the ability to perform certain functions. PWHB who experience severe depression and anxiety are more prone to fatigue in daily activities (Evon et al., 2016; Simonetti et al., 2018). Fatigue has been generally documented in the lives of liver patients and may alter HRQoL assessments in its severe forms (Evon et al., 2016; Jang, Kim, Lee, Lee, & Ahn, 2018; Swain & Jones, 2019; Tana, Alao, Morris, Bernstein, Hattenbach, Rehman, Brychta, Sarkar, Zhao, & Walter, 2018).

Fatigue in chronic hepatitis B is recognized to be more related to the severity of the disease state, the female sex, being single, and the presence of comorbidities (Evon et al., 2020; Evon et al., 2016). For instance, the female mean fatigue scores were 2.5 points higher than the male fatigue mean scores whiles those widowed or divorced had the mean fatigue scores to be 3.1 higher than people who were married (Evon et al., 2016). PWHB without complications may experience fatigue that is equal to the fatigue that the general population face (Evon et al., 2016). However, the presence of fatigue in some patients have a negative

impact on performing daily living activities and subsequently affect their HRQoL (Cimolai, 2019; Taheri Ezbarami, Hassani, Zagheri Tafreshi, & Alavi Majd, 2017).

Also, most patients who are fatigued tend to sleep less with lots of interruptions (Tana, Alao, Morris, Bernstein, Hattenbach, Rehman, Brychta, Sarkar, Zhao, Walter, et al., 2018). Averagely, fatigued liver patients slept about thirty minutes less and awoke about 4.1 more times than their non-fatigued controls (Tana, Alao, Morris, Bernstein, Hattenbach, Rehman, Brychta, Sarkar, Zhao, Walter, et al., 2018). The inability to sleep well significantly predicted an inadequate HRQoL for PWHB (Simonetti et al., 2018). Again, age associates negatively with physical functioning among PWHB (Karacaer et al., 2016; Simonetti et al., 2018). Therefore, older PWHB could have more difficulty in performing daily activities than younger patients.

2.5.3 General health perceptions of PWHB

A thorough search of literature portrayed a scarcity of literature on the health ratings of individuals living with chronic hepatitis B. Nevertheless a study by Sousa and Kwok (2006) who simultaneously examined symptoms, functioning, general health perceptions, and HRQoL in HIV patients revealed that the health ratings of HIV patients were negatively predicted by their symptoms status and positively predicted by their functional health. Again, the general health perception of HIV patients correlated positively with HRQoL (Sousa & Kwok, 2006).

Relevant factors that could influence the health ratings of PWHB were reviewed. First, a large population of Ghanaians are not very well informed about hepatitis B (Abdulai et al., 2016; Adoba et al., 2015). Whiles assessing the level of Hepatitis B knowledge and awareness among pregnant women, Abdulai et al. (2016) realized only 41% of their respondents were aware that hepatitis B was a disease. This lack of knowledge about chronic hepatitis B may hinder patients from considering the lifelong effect of chronic hepatitis B

on the liver and its impact on their HRQoL. Some Ghanaians have attributed the source of chronic hepatitis B to be from witches, spiritual poisoning, and as a penalty from gods for evil doings (Adjei et al., 2019b). This false perception of the cause of the disease may influence the health rating of PWHB.

Secondly, chronic hepatitis B presently does not have a cure, yet, most patients keep hopes of being cured of their chronic state (Adjei et al., 2017; Taheri Ezbarami et al., 2017). The hope of cure from chronic hepatitis B was observed in the majority of the participants in a qualitative study among PWHB in Iran (Taheri Ezbarami et al., 2017). Many Ghanaians living with chronic hepatitis B also have firm believes in being cured of the infection because they trusted in God and His ability to do all things (Adjei et al., 2017). Keeping such hopes and faith may eventually affect the HRQoL of patients as they realize the chronicity of hepatitis B with time.

Again, some PWHB have a negative attitude towards their health and life in general (Ansari et al., 2019). PWHB who witness others with the infection suffering complications or dying loose hopes of living meaningful lives with the hepatitis B virus (Taheri Ezbarami et al., 2017). For instance, a patient who saw his father die of cirrhosis as a results of hepatitis narrated how the experience has created the fear of death in him (Taheri Ezbarami et al., 2017). As a result, life loses its meaning and joy for such individuals. In the absence of physical symptoms as in the case of inactive carriers who may not be on antiviral therapy (Taheri Ezbarami et al., 2017), health perceptions of patients may be clouded from accepting their illness and taking precautionary measures. Simonetti et al. (2018) advocated for proper education on patient condition as most PWHB even in the phase of severe fibrosis may have unnoticeable physical symptoms.

2.5.4 The health-related quality of life of PWHB

Several studies have documented the HRQoL of PWHB (Ansari et al., 2019; Karacaer et al., 2016; Li et al., 2018; Spiegel et al., 2007; Z. M. Younossi et al., 2018; Z. M. Younossi, Stepanova, Younossi, Pan, et al., 2019; Zhu et al., 2019). The majority of these studies recorded a low HRQoL of PWHB (Ansari et al., 2019; Ferreira, de Almeida-Neto, Teixeira, & Strauss, 2015; Simonetti et al., 2018), albeit some authors found HRQoL to be relatively high in patients with uncomplicated chronic hepatitis B (Evon et al., 2020; Karacaer et al., 2016). Nevertheless, disease progression and the presence of other illnesses further compromises HRQoL for both groups (Ngo et al., 2019).4

Psychological disturbances especially depression and anxiety impacts negatively on the HRQoL of hepatitis B patients. Continuous advocacy to include psychological diagnosis and interventions in the care of PWHB exist in the literature (Simonetti et al., 2018; Vu et al., 2019). Nevertheless, the effects of 8 sessions of 45minutes cognitive behavioral therapy with PWHB showed only an improvement in the emotional well-being without any significant improvement in their HRQoL (Riyahi, Ziaee, & Dastjerdi, 2018). This may suggest further investigation into the real issues behind a compromised HRQoL of PWHB.

Also, the HRQoL of PWHB generally decreases in the presence of other comorbidities (Karacaer et al., 2016; Simonetti et al., 2018). For instance, the presence of another disease like HIV may increase the physical limitations of a patient, decrease their self-sufficiency, increase their medications, and reduce the overall quality of their lives (Karacaer et al., 2016). Only a few studies assessed the HRQoL of PWHB without complications (Evon et al., 2020; Karacaer et al., 2016). The review of the HRQoL of PWHB has been done according to the subscales of the hepatitis B HRQoL instrument version 1.0 (Spiegel et al., 2007)

2.5.4.1 Psychological Well-Being

Most PWHB face a lot of psychological stresses (Adjei et al., 2017; Hassani, Ezbarami, Tafreshi, & Majd, 2017; Taheri Ezbarami et al., 2017; Wallace et al., 2017). Qualitative methods have helped to understand the experiences that individuals go through as they live with the hepatitis B infection (Adjei et al., 2017; Taheri Ezbarami et al., 2017). Little information exists to authenticate this claim in Ghana as only a few studies were identified in this area from the country (Adjei et al., 2017; Adjei, Stutterheim, Naab, & Ruiter, 2020).

Living with an infectious and chronic illness can be lonely and worrying (Falvo & Holland, 2017). Patients suffer fear, anger, and frustrations as they live with the infection (Adjei et al., 2017; Taheri Ezbarami et al., 2017). Augmenting these challenges is the patient's inability to share their experiences with close relatives. The fear of becoming a burden and or being recognised as a source of possible infection to relatives serves as constraints of hepatitis B positive status disclosure (Adjei et al., 2020; Hassani et al., 2017; Wallace et al., 2017). Hence, amidst the stress, most patients suffer alone or are treated differently by those who have come to know their positive status (Wallace et al., 2017).

For most patients, nothing remains the same after their diagnosis (Taheri Ezbarami et al., 2017). Extensive life changes in employment and educational choices make life less enjoyable (Wallace et al., 2017). For instance, even though bigger factories had better incentives, some patients opted to work in small factories fearing the risk of disclosing their hepatitis B positive status in bigger factories where medical examinations were a requirement for employment (Wallace et al., 2017). Despite the stresses, others tended to value the rest of their lives and live in gratitude (Taheri Ezbarami et al., 2017).

2.5.4.2 Anticipation Anxiety

The fear of the unknown outcome of a person's infection causes anxiety (Falvo & Holland, 2017). PWHB who have witnessed relatives or known someone who has suffered chronic hepatitis B, its complications or died of chronic hepatitis B mostly suffer the fear of going through the same ordeal (Adjei et al., 2017; Taheri Ezbarami et al., 2017). A participant explained how a friend died five years after being diagnosed of chronic hepatitis B making it extremely scary when the participant learned about her positive status (Adjei et al., 2017).

The unknown outcome of disclosure creates anxiety for PWHB (Taheri Ezbarami et al., 2017). Patients who are unmarried exhibit more anxiety as they fear the outcome of their marriage proposals should they disclose their hepatitis B positive status (Ansari et al., 2019). Several PWHB have narrated how their partners leave upon learning their hepatitis B positive status. Sometimes even when the partners are willing, the pressure from relatives to end the relationship is too strong to ignore (Wallace et al., 2017). Similarly, employees with chronic hepatitis B fear disclosing their positive status to employers as they could be risking their jobs in doing so (Huang et al., 2016).

2.5.4.3 Vitality

Fatigue is well documented in PWHB (Cimolai, 2019; Evon et al., 2016; Jang, Boo, & Yoo, 2018; Tana, Alao, Morris, Bernstein, Hattenbach, Rehman, Brychta, Sarkar, Zhao, Walter, et al., 2018; Zhong et al., 2019). PWHB often experience body pain, tiredness, and a feeling of wanting more sleep which may interrupt daily activities (Karacaer et al., 2016). Fatigue among PWHB was mostly average and similar to that of the general population (Cimolai, 2019; Jang, Boo, et al., 2018). Again, in a literature review by Cimolai (2019) a worse fatigue state was strongly associated with the increased morbidity in chronic hepatitis B.

Some PWHB have expressed the inability to pursue their dreams in education and employment because of their hepatitis B positive status (Taheri Ezbarami et al., 2017; Wallace et al., 2017). Continuous medical examinations in educational and working environments prevents PWHB from progressing as they are unwilling to disclose their Hepatitis B positive status to institutional heads (Wallace et al., 2017). This perhaps causes a feeling of being less productive or slowed down whiles living with(Taheri Ezbarami et al., 2017).

2.5.4.4 Stigma

Generally, people living with infectious diseases are stigmatized in the form of isolation for the fear of transmitting the disease to others (Reluga, Smith, & Hughes, 2019; Smith-Palmer et al., 2020; Van der Scheun et al., 2019). Again, there is established stigmatization for being infected with diseases that have sexual modes of transmission especially in Sub-Saharan Africa (SSA) (Cort, Tu, & Medicine, 2018; Kelly, Reid, Lahiff, Tsai, & Weiser, 2017). Hepatitis B happens to fall in both categories hence, predisposing people living with chronic hepatitis B to stigmatization (World Health Organisation, 2020).

A systemic literature review on the impact of stigma revealed PWHB face stigma from social and institutional environments (Smith-Palmer et al., 2020; Wallace et al., 2017) including healthcare environments (Adjei et al., 2019b; Van der Scheun et al., 2019). Some patients recognised how they were isolated when receiving healthcare services and the extreme precautions healthcare workers took when taking care of them (Afihene et al., 2017; Taheri Ezbarami et al., 2017). Records reveal how PWHB suffer the risk of losing jobs or not gaining employment because of their hepatitis B positive status (Huang et al., 2016; Smith-Palmer et al., 2020). PWHB have said that others would usually treat them differently or avoid contact with them once they learn their hepatitis B positive status (Taheri Ezbarami et al., 2017).

Also, PWHB have linked stigma closely with disclosure and some have felt sorry about the stigma they suffered as a result of revealing their hepatitis B positive status (Adjei et al., 2020; Hassani et al., 2017; Huang et al., 2016). As a result, most infected persons hide their hepatitis B status from spouses, family, and friends for the fear of such stigmatization (Taheri Ezbarami et al., 2017). In an interview about disclosure, a chronic hepatitis B patient confessed that it would be "better to die than to tell" and be embarrassed (Adjei et al., 2020, p. 5).

The feeling of guilt among PWHB, often about the misconstrued routes of transmission can sometimes lead to self-stigma (Tu et al., 2020). PWHB accept and even feel they deserve ill-treatment as a result of their hepatitis B positive status. Such feeling of being responsible for ill-treatments is often accompanied by the overwhelming economic burden hepatitis B brings to friends and family (Deshpande et al., 2016; Nguyen et al., 2019; Tu et al., 2020; Zhang et al., 2016)

Interestingly, a systematic review confronting the stigma associated with chronic hepatitis B revealed lower or no stigma when the knowledge of hepatitis B is low and vice versa (Mokaya et al., 2018). As a result Dam et al. (2016) cautioned that education on chronic hepatitis B should be done such that individuals are empowered but not alarmed by the risks that chronic hepatitis B presents.

2.5.4.5 Vulnerability

Lifestyle changes accompany the diagnosis of chronic hepatitis B for most people (Adjei et al., 2017; Taheri Ezbarami et al., 2017). Patients work fewer hours, engage in weight management, and avoid stressful circumstances that may precipitate a poor prognosis of chronic hepatitis B (Taheri Ezbarami et al., 2017). For example, PWHB were careful not to consume anything that was assumed or known to worsen hepatitis B. Some

PWHB avoided alcohol and fatty foods after learning their hepatitis B positive status (Adjei et al., 2017).

In the quest to eliminate hepatitis B by all means, patients may seek medical help from unskilled or unauthorized herbal practitioners who promise a cure for chronic hepatitis B (Taheri Ezbarami et al., 2017). Amazingly, some PWHB were not concerned about being vulnerable and still kept high-risk behaviors after diagnosis (Taheri Ezbarami et al., 2017).

2.5.4.6 Transmission

The majority of PWHB worry about being the source of infection to their loved ones (Balasundaram et al., 2019; Hajarizadeh et al., 2016; Taheri Ezbarami et al., 2017). More than half of the participants (53%) in Hajarizadeh et al. (2016) study worried about being the source of infection to others. Nevertheless, some PWHB may not take any precautions to prevent the spread of the virus because they may not have disclosed their hepatitis B positive status to their family members (Taheri Ezbarami et al., 2017).

Married PWHB with spouses of the negative hepatitis B status fear transmitting the virus to their spouses during intimacy even if the spouse with the negative hepatitis B status has been vaccinated (Hassani et al., 2017). This may cause stress for both partners and affect their QoL.

2.5.5 Demographic characteristics of PWHB

The influence of demographic characteristics of PWHB on their HRQoL is well known (Karacaer et al., 2016; Simonetti et al., 2018). Different populations have produced different results in terms of age, gender, marital status, the stage of the hepatitis B infection, and whether on or off antiviral therapy for chronic hepatitis B (Karacaer et al., 2016; Simonetti et al., 2018; Vu et al., 2019; Xue et al., 2017)

Gender differences in the HRQoL of PWHB have clinical significance (Karacaer et al., 2016; Ngo et al., 2019). Females have recorded lower HRQoL as compared to the male

counterparts (Karacaer et al., 2016). This is not surprising as females are generally known to have less social support when they suffer chronic illness and may delay in accessing healthcare (Vlassoff, 2007). Healthcare workers develop strategies to support the female client. Also, advancing age may affect HRQoL of PWHB negatively (Li et al., 2018; Simonetti et al., 2018; Vu et al., 2019). Older people tend to experience low HRQoL scores (Simonetti et al., 2018). This is contrary to the Turkish population where age had no association with psychological symptoms nor the overall HRQoL (Karacaer et al., 2016).

Being married gives an infected person psychological and financial support that enables a person to live with hepatitis B with minimal effect on the HRQoL (Karacaer et al., 2016; Ngo et al., 2019). For example, Karacaer et al. (2016) found the HRQoL among singles to be significantly lower than their married counterparts in Turkey. Despite these assertions, patients from Vietnam who lived with their spouses demonstrated a higher depressive symptom score compared with single patients (Vu et al., 2019). A detailed explanation of these findings may be found in a paper that enumerated the challenges that married PWHB face especially when their partners are of the negative hepatitis B status (Hassani et al., 2017). Some of the patients contended with issues of disclosure and the fear of being the source of infection for their partners which could worsen psychological symptoms (Hassani et al., 2017).

2.5.6 Socio-economic factors of PWHB

Socio-economic factors affect the HRQoL of people who live with chronic hepatitis B (Karacaer et al., 2016; Simonetti et al., 2018; Wallace et al., 2017). Educational level , employment choices (Wallace et al., 2017), and income (Vu et al., 2019) play a pivotal role in the HRQoL of PWHB.

Some studies have documented the financial burden of living with chronic hepatitis B infection (Deshpande et al., 2016; Nguyen et al., 2019; Zhang et al., 2016). In Ghana,

researchers have advocated for the treatment of hepatitis B to be included in the services rendered by the National Health Insurance Scheme to relieve patients from the financial burden of living with hepatitis B (Afihene et al., 2017; Ofori-Asenso & Agyeman, 2016). Presently patients continue to suffer the cost of laboratory expenses and the cost of treatment for chronic hepatitis B. Patients who are financially sound are able to maintain a better psychological status than those with low income or without jobs. Higher-income levels associate better with low depressive symptoms in chronic hepatitis B as compared to patients with low income and those who were unemployed (Vu et al., 2019). However, Kim et al. (2015) found high-income levels to be associated with decreased HRQoL.

Lower education is associated with higher depressive symptoms which in turn decrease HRQoL (Balasundaram et al., 2019; Karlidağ & Atmaca, 2019). Patients with at least secondary education may be able to read about hepatitis B and gain a better understanding in addition to the education that is given by clinicians. The difficulty of having to explain the technicalities of hepatitis B (active carriers, inactive carriers, fibrosis, and cirrhosis) may also contribute to the inability of less-educated patients to comprehend (Simonetti et al., 2018; Taheri Ezbarami et al., 2017). On the contrary, Kim et al. (2015) found higher education levels to have low HRQoL and explained this may be due to the social behavior of Koreans and because of educated patient's effort to prevent disclosure that leads to stigmatization. Again Hajarizadeh et al. (2016) found increased anxieties in highly educated chronic hepatitis B patients due to their ability to read which may possible compromise their HRQoL.

Antiviral therapy for chronic hepatitis B and how its association with patient HRQoL has generated diverse outcomes in the literature (Ansari et al., 2019; Xue et al., 2017)

2.6 Summary

The HRQoL model by Wilson and Cleary (1995) revised by Ferrans et al. (2005) has empirical evidence in monitoring the HRQoL of people living with chronic disease (Bakas et al., 2012). The assessment of HRQoL is important in the case where people have to live with diseases for life and provides opportunities for health care services to be improved (Li et al., 2018).

Hepatitis B infection may be acute or chronic. Chronic hepatitis B exist in four stages, namely; Immune-Tolerant Phase, HBeAg-Positive Immune-Active / immune clearance phase, Inactive Chronic Hepatitis B Phase and the HBeAg-Negative Immune Reactivation Phase (Shi & Shi, 2009; Tang et al., 2018; Terrault et al., 2018; Yim & Lok, 2006).

The QoL of PWHB is relatively low across different countries (Hassani et al., 2017; Simonetti et al., 2018; ul Haq, Hassali, Shafie, Saleem, & Aljadhey, 2012; Z. Younossi, Guyatt, Kiwi, Boparai, & King, 1999; Z. M. Younossi, Stepanova, Younossi, Papatheodoridis, et al., 2019). However for PWHB without complications or physical symptoms, the assessment of HRQoL is not different from the general population (Evon et al., 2020)

The factors that affect the of HRQoL of PWHB may include psychological symptoms, severity of the disease, gender, education, the presence of other comorbidities, and the socio-economic status of PEWHB (Evon et al., 2020; Tian et al., 2017; Yilmaz et al., 2016).

The assessment of the HRQoL of PWHB has generated different results for different populations and suggested several modifications in the care of PWHB (Ansari et al., 2019; Simonetti et al., 2018; Xue et al., 2017). Even though psychosocial challenges may exist in the Ghanaian hepatitis B population (Adjei et al., 2017), it appears there is no evidence of HRQoL assessment of the hepatitis B population in Ghana. This evidence makes it important to assess the HRQoL of PWHB in the Ghanaian population.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter describes the methods used to carry out the study. It contains details about the study design, the process for obtaining the data, the study setting, measures used to ensure reliability, statistical analyzes used, and how the data is stored.

3.1 Study Design

A quantitative correlational approach with a cross-sectional design was used for the study. The correlational approach was chosen because the researcher observed and described the relationships between the outcomes of health without manipulating any of the variables in the study (Creswell & Creswell, 2017; Kumar, 2019). The design also assisted to establish the relationships between the variables of HRQoL and the phenomenon for PWHB.

A cross-sectional survey is appropriate for this study since data was collected at a particular point in time without follow-up on the respondents (Levin, 2006).

3.2 Study Settings

The Ashanti Region is located centrally in the middle belt of Ghana and is the third largest of 16 administrative regions and occupies a total land surface of 24,389 km2 of the total land area of Ghana. It is the most populated region with a population of 4,780,380, accounting for 19.4% of Ghana's total population (Ghana Statistical Service, 2014). The region is centrally located and shares boundaries with Eastern region, Central region, Western north region, Ahafo region, Brong Ahafo region and Bono east region. The regional capital is Kumasi. The region has hepatitis B prevalence rate of 13.1% which is greater than

the national prevalence (Ofori-Asenso & Agyeman, 2016) and can be classified as a region with very high hepatitis B prevalence.

The study will be conducted in the Komfo Anokye Teaching Hospital (KATH). The hospital was established in 1954 and became operational in 1955 (Komfo Anokye Teaching Hospital, 2019). The name of the hospital was changed from Kumasi central hospital to Komfo Anokye hospital to honor the legendary Ashanti fetish priest Komfo Anokye. In 1975, the facility became a teaching hospital upon the establishment of the School of Medical Sciences in the Kwame Nkrumah University of Science and Technology (Komfo Anokye Teaching Hospital, 2019).

The 1200 bed capacity teaching hospital has about 4000 varied workforces. The hospital offers both clinical and non-clinical services. KATH is the only teaching hospital and tertiary referral point for the people of the Ashanti region and its environs.

3.3 Target Population

The study targeted adult Ghanaians (18 years and above) living with chronic hepatitis B in the Kumasi Metropolis.

3.3.1 Inclusion Criteria

Respondents were included in the study if they had tested HBsAg positive for six months or more and consented to participate in the study. This was because people who had lived with hepatitis B for less than 6months may not be able to accurately describe the impact of hepatitis B on their HRQoL (Patino & Ferreira, 2018).

3.3.2 Exclusion Criteria

PWHB living with comorbid conditions such as the human immunodeficiency virus (HIV) and those who had developed complications such as liver cirrhosis and liver cancer

were exempted from the study. The HRQoL of PWHB and other conditions may not reflect the actual situation for those living with only hepatitis B (Garg, 2016).

3.4 Sample Size

Cochran's formula helps to determine a representative proportion from a large population for research purposes (Israel, 1992). Cochran's formula was used to determine the sample size for the study.

$$n = \frac{z^2 (pq)}{e^2}$$

Where:

n = sample size

p = the (estimated) proportion of the population which has the attribute in question (prevalence of hepatitis B in Ghana 12.3%=0.123)

e = the desired level of precision (0.05)

z = statistics for level of confidence (i.e. 1.96)

q is 1 – p = 1-0.123 =0.877

Substituting the values into the formula,

$$n_0 = \frac{(1.96)^2 (0.123)\ (0.877)}{(0.05)^2}$$

$$n_0 = \frac{(3.8416)\ (0.107871)}{0.0025}$$

$n_0 = 166$

10% of the sample size was added to take care of non-responses and therefore $n_0 = 183$

Hence, a total of 183 people living with hepatitis B were targeted for the study.

3.5 Sampling Technique

Sampling is the process of selecting a portion of the population that has similar features as the entire population being studied (Etikan, Musa, & Alkassim, 2016). A combination of the convenience and proportional quota non- probability sampling techniques was used in the study to select PWHB who met the inclusion criteria. The convenience sampling technique is a type of non-probability sampling technique, that selects members of a target population that meets a certain criteria, such as easy accessibility, geographical proximity, availability at a given time, or the willingness to participate are included in a study (Etikan et al., 2016).

Also, applying the proportional quota sampling technique, 100 respondents on treatment and 83 respondents not on treatment were included in the study to provide a better representation of both groups of respondents in the study. (Vehovar, Toepoel, & Steinmetz, 2016). This was done based on the data at the gastroenterology clinic in the Komfo Anokye hospital which revealed almost twice the PWHB receiving treatment as compared with the PWHB not receiving treatment. PWHB at the study setting who met the inclusion criteria and were willing to participate in the study were selected to participate in this study.

3.6 Instrument for the Study

Standardized instruments that have been validated and proven to be reliable were used in this study (See appendix G). The instrument is a combination of scales that assessed the six constructs in the model in five sections.

Section A consists of questions that assessed the individual and environmental characteristics of the respondents.

Section B is the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983) which assessed the psychological symptoms of the patients and were the independent variables in the study. The possible scores range from 0 to 21 on each subscale. The scores

are interpreted as 0-7 = normal 8-10 = borderline abnormal (borderline case) 11-21 = abnormal (case) in both the anxiety and depression scale (Zigmond & Snaith, 1983).

Section C is the Functional Well-Being Scale in the Functional Assessment of Non-Life-Threatening Conditions (FANLTC) (Cella et al., 1993) and assessed the functional status of the patient with hepatitis B. The scale was one of the two mediating variables in the study. The functional well-being subscale on the FANLTC scale was scored by summing the scores of the individual items, multiplying by 7 and dividing by the number of items answered. The 4 point Likert scale has a total score range of 0 to 28. The higher the score the higher the functional well-being (Cella et al., 1993).

Section D is the 'excellent to poor' self-rated health item (Hays et al., 2015) that rated the general health perception of PWHB. The 'excellent to poor' self-rated health item was the second mediating variable for the study. The 'excellent to poor' single item was reversed to let excellent health be scored 5 whiles poor health was scored 1. The raw scores of the self-rated item and its assigned categories were used in the analysis. Thus, a score of 5 represented excellent health, 4 very good health, 3 good health, 2 fair health and 1 poor health (Hays et al., 2015) .

Section E of the instrument is the Hepatitis B HRQoL Instrument Version 1.0 developed by Spiegel et al. (2007) which evaluated the HRQoL of PWHB. The hepatitis B HRQoL instrument version 1.0 was reversed backward to let high scores represent high HRQoL and low scores represent low HRQoL. The 5-point scale was transferred onto a 100-point measurement for a lowest score of 31=0 and a maximum score of 155 to be =100 as most of the studies who used the tool modified for easy assessment (Amirhossein Modabbernia et al., 2012; Karacaer et al., 2016; Spiegel et al., 2007). A score of 70 and above was categorized as a high HRQoL whiles any score below 70 was a low HRQoL

(Amirhossein Modabbernia et al., 2012). The Hepatitis B HRQoL Instrument Version 1.0 represented the dependent variable in the study.

3.7 Validity and Reliability of the Instruments

The questionnaires adopted for the study were standard with satisfactory reliability coefficients and suited the objectives for the study.

3.7.1 Validity and Reliability of the Hepatitis B HRQoL Instrument Version 1.0

From the works of Spiegel et al. (2007), an extensive content validity process was employed to arrive at the items for the instrument. The scale was found to be reliable. It demonstrated a high consistency within subscales and within the overall higher order scale. The Cronbach's alpha for the subscales are psychological well-being- 0.90, anticipation anxiety- 0.88, vitality- 0.90, stigmatization- 0.89, vulnerability- 0.82 and transmission- 0.73 (Spiegel et al., 2007). The overall Cronbach's alpha score was 0.96 (Spiegel et al., 2007). The scale has been used in other settings including, Iran and Turkey and still found to have sufficient validity and internal consistency scores for sub scales ranging from 0.73 to 0.96 and an overall Cronbach's alpha being 0.96 (Amirhossein Modabbernia et al., 2012; Karacaer et al., 2016).

3.7.2 Validity and reliability of the Hospital Anxiety and Depression Scale (HADS)

The HADS was developed by Zigmond and Snaith (1983). Its psychometric properties have been tested across different medical conditions and populations (Bond, Burns, & Ehrlich-Jones, 2019; Hyland et al., 2019; Maass, Roorda, Berendsen, Verhaak, & de Bock, 2015). Form a literature review of the psychometric properties of the hospital anxiety and depression scale, the Cronbach's alpha of the anxiety subscale ranged from .68 to .93 whiles the Cronbach's alpha for the depression subscale ranged from .67 to .90. (Bjelland, Dahl, Haug, & Neckelmann, 2002).

3.7.3 Validity and reliability of the functional well-being scale in the functional assessment of non-life-threatening conditions (FANLTC)

The functional well-being scale is a subscale in the FANLTC scale which is in the Functional Assessment of Chronic Illness Therapy (FACIT) group of questionnaires (Cella et al., 1993; Webster, Cella, & Yost, 2003). As noted by the author, the psychometric properties of the scales are all based on the second version of the original instrument which consists of 28-items except it has been stated otherwise (Cella et al., 1993). The 3rd and 4th versions did not compromise the instruments psychometric properties (Winstead- Fry & Schultz, 1997). The functional well-being scale in this study is part of the 4th version of the FANLTC scale.

The overall Cronbach's alpha of the FANLTC scale is .89 whiles the Cronbach's alpha for the functional well-being scale is .80 (Cella et al., 1993). Both patients and specialists were engaged in building the form and content of the questionnaires. The test retest reliability was #assessed using 60 patients with varied chronic illness. Correlation coefficient *r* ranged from .82 to .92 (Cella et al., 1993).

3.7.4 Validity and reliability of the 'excellent to poor' self-rated health item

The 'excellent to poor' self-rated health item which is one of the items on the SF-36 Health survey was validated by (Hays et al., 2015) in a large population of 21,133 in the United Nations (U.S).

The item was used with the Patient-Reported Outcomes Measurement Information System (PROMIS) global physical health scale and the product moment correlation, *r* was .81. However, the Cronbach's alpha of the item was .52. The single item was found to have the ability to estimate scores for the PROMIS global physical health scale in monitoring the health of populations.

3.8 Data collection procedure

Respondents were recruited from the KATH after ethical clearance was given to carry out the study by the institutional review boards of the Ghana Health Service and the Komfo Anokye Teaching Hospital. Pretesting of the instrument was done at the Bekwai municipal Hospital with 20 respondents. It influenced the presentation of the HADS in a single line as respondents skipped some questions when the presentation was two questions in a column.

Introductory letters from the School of Nursing and Midwifery, University of Ghana, an application to research at the gastroenterology clinic in the KATH and the ethics approval from the KATH and the Ghana Health Service institutional review boards were presented to the office of the director of medicine at KATH. The director of medicine, KATH gave the permit and an introductory letter to the head of the gastroenterology clinic and the director of nursing services in-charge of the gastroenterology clinic. The researcher met the gastroenterology clinic heads and explained the purpose of the study and secured their support. The clinic heads assisted the researcher to recruit two graduate nurses in the clinic to assist in data collection. The selected nurses were then trained for data collection. The selected nurses were then trained for data collection, which is distribution of the questionnaires. Doctors and nurses of the gastroenterology clinic helped to identify clients who met the inclusion criteria for the study. The prospective respondents were then referred to the data collection team in privacy. All clients who met the inclusion criteria on each clinic day were approached.

The purpose of the study was explained in detail to the prospective respondents to get their cooperation during the recruitment session. The rights of each client to withdraw from the study at any given time was also explained. Clients who consented orally after reading the information sheet (or having been read and interpreted to) were given a consent form to sign as an indication of their willingness to be part of the study. Respondents who could not

sign were given ink to thumb print and indicate their consent. The questionnaire was then administered to the respondents. An interpreter was provided for 31 respondents who could not read. Respondents were cumulatively recruited each clinic day until the total number of 183 respondents (100 respondents on treatment and 83 not on treatment) was reached.

Also, applying the proportional quota sampling technique, 100 respondents on treatment and 83 respondents not on treatment were included in the study to provide a better representation of both groups of respondents in the study. This was done based on the data at the gastroenterology clinic in the KATH which revealed almost twice the PWHB receiving treatment as compared with the PWHB not receiving treatment. Data collection lasted for a period of five months. (From 2nd March 2020 to 27th July, 2020).

3.9 Data management and analysis

A code book was developed in advance specifying how each data would be recorded. The researcher employed the help of two nurses to assist in data collection after training. Data management begun at the data collection site where inspection for missing data was carried out. After entering the data in the Statistical Product and Service Solutions (SPSS) program, frequencies were run on all variables to examine for missing data. Corrections were made by referring to the original hard copy of the data. One respondent missed almost half of the items whiles another one made several multiple entries. Thus, the two respondents were not included in the study. A total of 180 hard copies of the data are being kept under lock and key in a drawer in the supervisor's office and the soft copy saved in a file with a password.

Statistical Product and Service Solutions (SPSS) version 23.0 was used to analyze the data.

1. Frequencies and percentages were used to assess the individual and environmental characteristics of the respondents.

2. Skewness, kurtosis, mean, standard deviation, Pearson r, and Cronbach's Alpha were used to assess descriptive statistics (normality, reliability, and inter-correlations among study variables).
3. Third, hierarchical multiple regression and *Sobel test* of significant indirect effect were used to assess the study objectives.

3.10 Ethical consideration

Respondents for the study were recruited after ethical clearance was obtained from Institutional Review Boards (IRB) of the Ghana Health Service and the Komfo Anokye teaching hospital. Introductory letters from the School of Nursing and Midwifery, University of Ghana and the Komfo Anokye teaching hospital were used to gain permission from the management of the data collection site. With the help of nurses from the department, patients who qualify for the study were identified from the registry and approached. The purpose of the study, benefits to respondents, and potential risks were explained to the respondents. Those who agreed to participate in the study by giving oral consent were given an information sheet about the study and a written consent was then taken. The right of the patient to withdraw from the study at any given time was explained to the respondents. The recruitment of the study respondents was done individually to ensure the privacy of each client.

3.11 Summary

A quantitative correlational approach with a cross-sectional design was used for the study at the KATH in the Kumasi metropolis of Ghana. The hospital was purposefully chosen as it is the only facility within the region rendering specialised care for PWHB. The study targeted 183 adult with hepatitis B. respondents were included in the study if they had lived with hepatitis B for more than 6 months and were excluded if they had complications or lived with other chronic diseases like HIV. A combination of the convenience and

proportional quota non- probability sampling techniques were used to recruit the respondents. Standardised instruments comprising of the the HADS, the functional well-being scale in the functional assessment of non-life-threatening conditions (FANLTC), the excellent to poor health rating item, the Hepatitis B HRQoL Instrument Version 1.0 and questions that assessed the individual and environmental characteristics of the respondents. We obtained ethical clearance from Institutional Review Boards (IRB) of the Ghana Health Service and the Komfo Anokye teaching hospital and collected data after receiving an informed consent from respondents. Using the Statistical Product and Service Solutions (SPSS) version 23.0, the data of 180 respondents was analyzed. Hard and soft copies of the data are all kept safely with locks.

CHAPTER FOUR

DATA ANALYSIS AND RESULTS INTERPRETATION

4.0 Introduction

The study assessed PWHB on four outcomes of health namely, psychological symptoms (depression and anxiety), functional well-being, general health perception and HRQoL. In addition individual and environmental characteristics were assessed. In all, five objectives were stated. To examine the associations of health outcomes and determine the direct and indirect predictions of each health outcome in the HRQoL model (Ferrans et al., 2005).

To achieve the stated objectives, a total of 183 questionnaires were distributed to respondents capturing individual and environmental characteristics, psychological symptoms (depression and anxiety), functioning, general health perception and HRQoL. All the 183 questionnaires distributed were retrieved from the respondents indicating a response rate of 100 *percent*. Data screening and management was done using SPSS version 23. One respondent missed almost half of the items while another one made several multiple entries hence were eliminated from further and final analysis.

Analysis of the study data was done in three ways. First, the researcher used frequencies and percentages to assess the individual and environmental characteristics and the health outcomes of the respondents. Second, skewness, kurtosis, mean, standard deviation, Pearson r, and Cronbach Alpha were used to assess descriptive statistics (normality, reliability, and inter-correlations among study variables). Third, hierarchical multiple regression and *Sobel test* of significant indirect effect were used to assess the study objectives.

The chapter therefore begins with assessment of respondent characteristics, descriptive statistics, assessment of study objectives, and concludes with an observed model.

4.1 Assessment of individual and Environmental Characteristics and HRQoL

Individual and environmental characteristics identified as likely to have influence on the study variables and included in the current study are age, gender, marital status, employment status, monthly income, educational level and being on antiviral therapy for hepatitis B.

Analysis of the data showed that greater number of the respondents were within the age bracket 31to 40 years with majority *60.60%)* being males. More so, majority of the respondents had full employment *(63.90%)* and were married *(51.70%).* Furthermore, a greater number *(40.60%)* of the respondents had tertiary education with slightly more B *(37.20%)* of the respondents earning below GH¢ 350 every month and being on antiviral therapy B *(55.0%)* for chronic hepatitis. Approximately three quarters *(75.5%)* of the respondents had a low HRQoL. In effect, the analysis of the individual and environmental characteristics showed that more *(81.7%)* of the respondents for the study were 31 years and older and predominantly *(60.60%)* male by sex, married *(51.70%),* had full time employment *(63.90%),* earned below GH¢ 350 every month *(37.20%),* had tertiary education *(40.60%)* and were on antiviral therapy for chronic hepatitis B (*55.00%).* The analysis also showed that the majority *(75.50%)* of PWHB in the Kumasi metropolis have a low HRQoL. Table 1 presents detailed results from the data analysis.

Table 1: Summary of Frequencies and Percentages for Individual and Environmental Characteristics

Characteristics	Frequency	*Percent* (%)
Individual		
Age		
• 30years & below	33	18.30
• 31 to 40 years	75	41.70
• 41 to 50 years	28	15.60
• Above 50 years	44	24.40
Sex		
• Male	109	60.60
• Female	71	39.40
Marital Status		
• Married	93	51.70
• Single	63	35.00
• Divorced	11	6.10
• Widowed	13	7.20
Environmental		
Employment status		
• Full time	115	63.90
• Part-time	13	7.20
• Retirement	15	8.30
• Unemployed	37	20.60
Income		
• GH¢ 350 and below	67	37.20
• Above GH¢ 350 to GH¢ 700	49	27.20
• Above GH¢ 700 to GH¢ 1050	17	9.40
• Above GH¢ 1050	47	26.20
Formal Education		
• Basic	45	25.00
• Secondary	44	24.40
• Tertiary	73	40.60
• No Formal Education	18	10.00
Antiviral therapy for hepatitis B		
• Yes	99	55.00
• No	81	45.00
HRQoL		
• High HRQoL	44	24.44
• Low HRQoL	136	75.55

N = 180 Source: Field Data 2020

4.2 Assessment of Descriptive Statistics

This assessment was done using the normality test (mean, standard deviation, skewness and kurtosis), reliability (internal consistency/Cronbach's Alpha) and inter-correlations (Pearson r).

4.2.1 Normality Testing

The normality of the study variables were examined. This was done particularly to provide a basis for the use of parametric tests like regression. To establish this, skewness and kurtosis were used using the ±1 (normally distributed) and ±2 (acceptable, not substantially deviated from normality) critera (Field, 2013). As shown in Table 2, depression composite skewness and kurtosis scores were .564 and -.338 respectively. Additionally, the seven questions for depression fell within the ±1 criterion. These outcomes show that depression scores were normally distributed with an average score of 5.194 and a standard deviation of 3.660. Similarly, anxiety composite skewness and kurtosis scores were .770 and -.058 with the individual questions falling within ±1 criterion suggesting that anxiety scores were normally distributed. In addition, functional well-being scores were identified to be normally distributed with skewness (-.666) and kurtosis (-.241) within the criteria ±1 (Field, 2013) General health perception was also normally distributed with skewness (-.045) and kurtosis (-.417) within the criteria ±1. These outcomes show that predictors (depression and anxiety) and mediators (functional well-being and general health perception) were normally distributed (Field, 2013).

Table 2: Summary of Mean, Standard Deviation, Skewness and Kurtosis of Predictors, Mediators and Criterion variables

Questions	Mean	±SD	±Skewness	±Kurtosis
Depression	*5.194*	*3.660*	*.564*	*-.338*
hads_d1	.82	.868	.780	-.247
hads_d2	.69	.861	.914	-.316
hads_d3	.74	.880	.984	.080
hads_d4	.77	.898	.807	-.499
hads_d5	.71	.824	.899	-.073
hads_d6	.61	.787	.965	-.247
hads_d7	.87	.891	.638	-.594
Anxiety	5.872	4.033	.770	-.058
hads_a1	.75	.864	.928	.015
hads_a2	.77	.877	.915	-.012
hads_a3	.68	.829	.888	-.276
hads_a4	.87	.899	.546	-.914
hads_a5	1.06	1.023	.552	-.874
hads_a6	.79	.876	.767	-.414
hads_a7	.95	.861	.363	-.952
Functional Well-being	*20.556*	*5.509*	*-.666*	*-.241*
fwb_1	2.97	1.093	-.660	-.912
fwb_2	3.04	1.054	-.774	-.660
fwb_3	2.96	.979	-.705	-.304
fwb_4	3.06	1.023	-.650	-.860
fwb_5	2.92	1.138	-.778	-.405
fwb_6	2.85	1.060	-.465	-.910
fwb_7	2.77	1.123	-.713	-.298
General Health Perception	3.41	.775	-.045	-.417

Continued on next page

Table 2 shows that the criterion variable (HRQoL) composite skewness (.308) and kurtosis (-.737) were normally distributed (±1). Skewness for all the individual questions was within ±1 criteria meaning the criterion on skewness grounds was normally distributed. For kurtosis, majority of the questions were within ±2 meaning kurtosis was not substantially deviated from normality (Field, 2013).

Table 2 (continued)**:**

Questions	Mean	±SD	±Skewness	±Kurtosis
HRQoL	*99.711*	*25.566*	*.308*	*-.737*
qf1	2.67	1.349	.008	-1.470
qf2	2.36	1.259	.429	-1.072
qf3	2.97	1.279	-.191	-1.118
qf4	3.12	1.466	-.215	-1.379
qf5	2.57	1.178	.274	-.919
qf6	2.29	1.121	.540	-.658
qf7	2.24	1.243	.806	-.378
qf8	2.46	1.279	.441	-1.061
qf9	2.89	1.394	-.137	-1.406
qf10	2.33	1.113	.380	-.841
qf11	2.37	1.277	.492	-1.010
qf12	2.31	1.178	.409	-.977
qf13	2.48	1.179	.488	-.670
qc1	3.54	1.431	-.640	-.969
qc2	3.50	1.360	-.586	-.891
qc3	2.64	1.460	.267	-1.383
qc4	3.22	1.458	-.263	-1.381
qc5	2.93	1.406	.044	-1.382
qc6	2.71	1.377	.167	-1.289
qc7	3.04	1.546	-.121	-1.552
qc8	3.68	1.347	-.736	-.726
qc9	3.11	1.364	-.246	-1.209
qc10	2.93	1.337	-.079	-1.227
qc11	2.62	1.234	.152	-1.286
qc12	3.02	1.339	-.285	-1.253
qc13	3.65	1.339	-.678	-.807
qc14	2.74	1.312	.348	-1.054
qc15	3.16	1.294	-.387	-1.136
qp1	2.45	1.174	.132	-1.248
qp2	2.01	1.179	.857	-.390
qp3	2.31	1.256	.367	-1.248

Outliers were assessed and the output showed that no univariate or multivariate outliers were present. Furthermore, residuals were also examined to check the spread of individual scores and how the variables relate to each other. The analysis showed no problems of linearity or homoscedasticity and were all within the range of -3 to +3. In addition, the Variance Inflation Factor (VIF) for the predictor and mediator variables on the

criterion was between 1.884 and 2.699 which is less than 10 (Field, 2013) and tolerance statistics were between .370 and .531. These, therefore, confirm that collinearity was not a problem and that the predictor, mediator and criterion variables were all normal and can be used for parametric analyzes (Field, 2013). Descriptive statistics of the predictor and criterion variables, which include means and standard deviations were computed.

4.2.2 Reliability and Inter-correlations

The reliability of the study variables using Cronbach's Alpha or coefficient showed a very good reliability. Depression had an internal consistency of (α = .717), anxiety (α = .767), functional well-being (α = .860), and HRQoL (α = .949). The reliability for the study variables was all above the acceptable coefficient of 0.70 indicating appropriate internal consistencies of the items (Nunnaly & Bernstein, 1978).

Inter-correlations among the study variables were also computed. Results in Table 4.2.2 show a high, positive and significant relationship between depression and anxiety (r = .746, $p < .01$). In addition, depression had a medium, negative and significant relationship with functional well-being (r = -.650, $p < .01$), general health perception (r = -.530, $p < .01$) and HRQoL (r = -.449, $p < .01$) (Cohen, 1988; Field, 2013). Meaning, the presence of depression does have some decreasing effect on the functional well-being, general health perception and HRQoL of PWHB. Similar outcome were identified for anxiety such that it had a medium, negative and significant relationship with functional well-being (r = -.604, $p < .01$), general health perception (r = -.434, $p < .01$) and HRQoL (r = -.470, $p < .01$). Functional well-being and general health perception was identified to have a medium, positive, and significant relationship (r = .672, $p < .01$). This means that when the functional well-being of PWHB is good, it helps them to have a good or positive general perception regarding health. Finally, both functional well-being and general health perception had medium, positive, and significant relationship HRQoL (r= .549, $p < .01$), (r= .449, $p < .01$)

respectively. These outcomes justify mediation analysis as prescribed by Baron and Kenny (1986) that there must be a significant linear relationship between variables to justify mediation analysis.

Table 3: Summary of Inter-correlations and Internal Consistency (Reliability) of study variables

Study variables	1	2	3	4	5
Symptoms					
1. Depression	*(.717)*				
2. Anxiety	.746**	*(.767)*			
Mediators					
3. Functional Well-being	-.650**	-.604**	*(.860)*		
4. General Health Perception	-.530**	-.434**	.672**	-	
Criterion					
5. HRQoL	-.449**	-.470**	.549**	.488**	*(.949)*

**p< .01; N = 180; reliability in parentheses

Source: Field Data 2020

4.3 Assessment of study objectives

4.3.1 Objective 1: Examine the associations between psychological symptoms (depression and anxiety), functional well-being, general health perception, and HRQoL

The data analysis and interpretation of results as found in Table 3 show the following associations:

- There is a positive and significant association between depression and anxiety. Meaning increasing levels of depression lead to a corresponding increase in anxiety and vice versa.
- There is a significant negative relationship between depression and functional well-being. This suggests that, increasing levels of depression lead to a corresponding decrease in the functional well-being of the PWHB.

- There is a significant negative association between depression and general health perception. Meaning, heightened levels of depression lead to a reduced level of general health perception of the PWHB.
- There is a significant negative relationship between depression and HRQoL. This shows that the HRQoL of the PWHB suffers by their increasing depression levels.
- There is a significant negative relationship between anxiety and functional well-being. This shows that heightened anxiety levels as experience by the PWHB reduce their perception of how they function in society.
- There is a significant negative association between anxiety and general health perception. This suggests that anxiety has a toll on the general health perception of the PWHB such that any slight increase in anxiety leads to a corresponding decrease in the way they perceive their general health.
- There is a significant negative relationship between anxiety and HRQoL. That is, the HRQoL of the PWHB was observed to be impacted negatively as their anxiety levels increased.
- There is a significant positive relationship between functional well-being and general health perception. This means that increasing levels of functional well-being of the PWHB lead to an increased level of their general health perception.
- There is a positive significant relationship between functional well-being and HRQoL. This finding indicates that better functioning leads to a better HRQoL of the PWHB.
- There is a positive and significant association between general perception and HRQoL. This result shows that general health perception boosted the HRQoL of the people.

These outcomes, therefore, provide adequate evidence that the variables in the model can be examined together taking into consideration the individual and environmental characteristics.

4.3.2 Objective 2: Examine the direct prediction of HRQoL by psychological symptoms (depression and anxiety) functional well-being and general health perception

Analysis of the second objective was done using four steps. Step 1 and 2 captured the regression of the control variables (individual and environmental characteristics) on HRQoL. Step 3 captured the regression of the predictors (depression and anxiety) on HRQoL and step 4 captured the regression of the mediators (functioning well-being and general health perception) on HRQoL. The results are presented in Table 4.

Table 4: Hierarchical Multiple Regression of Individual Variables, Environmental Variables, Depression, Anxiety, Functional Well-being, General Health Perception and HRQoL

Model	Unstandardized B	Unstandardized SE	Standardized β	t	P
Step 1: Control-Individual Characteristics					
Age					
• 30yrs & below	-3.239	5.382	-.049	-.602	.548
• 41 to 50yrs	-7.907	5.606	-.112	-1.411	.160
• Above 50yrs	-12.238	5.259	-.206	-2.327	.021
Sex	-2.136	3.944	-.041	-.542	.589
Marital status	-1.532	2.375	-.053	-.645	.520
Step 2: Control-Environmental Characteristics					
Age					
• 30yrs & below	1.353	5.250	.021	.258	.797
• 41 to 50yrs	-5.289	5.233	-.075	-1.011	.314
• Above 50yrs	-12.981	5.181	-.219	-2.505	.013
Sex	.736	3.639	.014	.202	.840
Marital Status	.089	2.236	.003	.040	.968
Formal Education	-3.500	1.667	-.159	-2.100	.037
Employment					
• Full-time	-37.488	23.663	-.706	-1.584	.115
• Unemployment	-31.977	23.920	-.502	-1.337	.183
• Part-time	-41.217	24.432	-.418	-1.687	.093
• Retired	-19.658	24.383	-.213	-.806	.421
Medic (Yes 1, No 0)	-14.268	3.557	-.278	-4.012	.000
Income					
• Above GH¢ 350 to GH¢ 700	6.609	5.595	.115	1.181	.239
• Above GH¢ 700 to GH¢ 1050	13.842	7.236	.159	1.913	.057
• Above GH¢ 1050	27.468	5.890	.473	4.663	.000
Step 3: Predictors					
Age					
• 30yrs & below	-2.624	4.972	-.040	-.528	.598
• 41 to 50yrs	-5.524	4.913	-.079	-1.124	.262
• Above 50yrs	-9.488	4.930	-.160	-1.925	.056
Sex	-2.684	3.462	-.051	-.775	.439
Marital	1.970	2.118	.068	.930	.354
Formal Education	-2.820	1.564	-.128	-1.803	.073
Employment					
• Full-time	-34.717	22.221	-.654	-1.562	.120
• Unemployment	-30.314	22.358	-.476	-1.356	.177
• Part-time	-41.382	22.861	-.420	-1.810	.072
• Retired	-20.018	22.878	-.217	-.875	.383

Continued on next page

Table 4 (continued)

Model	Unstandardized B	Unstandardized SE	Standardized β	t	P
Medic (Yes 1, No 0)	-3.152	3.963	-.062	-.795	.428
Income					
• Above GH¢ 350 to GH¢ 700	3.791	5.437	.066	.697	.487
• Above GH¢ 700 to GH¢ 1050	9.858	7.023	.113	1.404	.162
• Above GH¢ 1050	23.685	5.703	.408	4.153	.000
Depression	-.833	.737	-.119	-1.130	.260
Anxiety	-2.031	.641	-.320	-3.170	.002
Step 4: Mediators					
Age					
• 30yrs & below	-4.536	4.788	-.069	-.947	.345
• 41 to 50yrs	-5.493	4.686	-.078	-1.172	.243
• Above 50yrs	-4.075	4.785	-.069	-.852	.396
Sex	-3.970	3.276	-.076	-1.212	.227
Marital	1.530	1.997	.053	.766	.445
Formal Education	-3.176	1.468	-.145	-2.164	.032
Employment					
• Full-time	-40.265	20.857	-.759	-1.931	.055
• Unemployment	-38.727	21.044	-.608	-1.840	.068
• Part-time	-43.294	21.425	-.440	-2.021	.045
• Retired	-22.936	21.446	-.249	-1.069	.286
Antiviral therapy for hepatitis B (Yes 1, No 0)	-2.606	3.725	-.051	-.700	.485
Income					
• Above GH¢ 350 to GH¢ 700	-.433	5.238	-.008	-.083	.934
• Above GH¢ 700 to GH¢ 1050	6.040	6.727	.069	.898	.371
• Above GH¢ 1050	17.558	5.576	.302	3.149	.002
Depression	.200	.722	.029	.278	.782
Anxiety	-1.356	.625	-.214	-2.171	.031
Functional Well-being	1.353	.465	.291	2.908	.004
General health perception	5.683	2.737	.172	2.077	.039

For Step 1, F= 1.907, $R^2 = .052$; step 2, ΔF = 6.093, $\Delta R^2 = .236$; for step 3 ΔF = 13.214, $\Delta R^2 = .099$, For Step 4, ΔF = 12.349, $\Delta R^2 = .081$; Durbin-Watson statistics of independent errors = 1.737

Source: Field Data 2020

4.3.2.1 Controlling for individual and Environmental characteristics

In Table 4, a significant model was observed ($F_{(18, 161)} = 7.905$, $p = .000$, $R^2 = .469$), indicating that the model containing the variables were significant. The r square shows that all the variables in the model contributed 46.9 *percent* of the variation in HRQoL. The errors are also found to be independent as the Durbin-Watson statistics is 1.737 which is close to 2 (and between 1 and 3).

In step 1, the model containing the individual characteristics was not significant ($F_{(5, 174)} = 1.907$, $p = .095$, $\Delta R^2 = .052$). However, the individual characteristics contributed 5.2 *percent* in predicting HRQoL. Sex and marital status had no significant prediction on HRQoL. Taking age into consideration, older respondents of above 50 years had a lower HRQoL ($\beta = -.206$, $t = -2.327$, $p = .021$).

In step 2, the model containing the environmental characteristics was significant ($F_{(9, 165)} = 4.778$, $p = .000$, $\Delta R^2 = .236$) and explained 23.6 *percent* of the variation in HRQoL. Education had a significant effect on HRQoL ($\beta = -.159$, $t = -2.100$, $p = .037$). Those on antiviral therapy for hepatitis B had a significant diminished HRQoL compared to those on no antiviral therapy ($\beta = -.278$, $t = -4.012$, $p = .000$). Those earning income GH¢1050 and above had a good HRQoL compared to those who earn below GH¢ 350 a month ($\beta = .473$, $t = -4.012$, $p = .000$). Marital status, employment and other levels of income failed to significantly predict the HRQoL of PWHB.

To conclude, out of the 46.9 *percent* in variation of HRQoL explained by all the variables, the control variables (individual and environmental) contributed 28.8 *percent* showing that the control variables had a major influence on the HRQoL of the people. However, it should be understood that environmental factors such as education, antiviral

therapy for hepatitis B and income of the people explained the larger variations in the QoL of PWHB in the Kumasi metropolis.

4.3.2.2 Psychological Symptoms Predicting HRQoL

Being guided by the HRQoL model by (Ferrans et al., 2005), in step 3, the model containing the predictors (depression and anxiety) was significant ($F_{(16, 163)} = 6.451$, $p = .000$, $\Delta R^2 = .099$). Depression and Anxiety together contributed 9.9 *percent* in explaining the variation of HRQoL of PWHB. The varying beta scores for depression (β = -.119) and anxiety (β = -.320) show that the two predictors are contributing differently to the significant model.

Depression predicting HRQoL

The unstandardized b coefficient for depression of (b = -.833) shows that as depression of the PWHB increases by one score, the HRQoL decreases by an extra 0.833 score. Meaning, for every additional increase in the depression level of PWHB is associated with a decline in their HRQoL. The standardized β for depression of -.119 also gives important information regarding how depression faired in predicting HRQoL and also contributing to the significant model observed. From Table 4, the standard deviation for depression is 3.660. Using the beta score and the standard deviation, it is observed that as depression of the PWHB increases by 3.660 standard deviation, HRQoL decrease by 0.119 standard deviations. The standard deviation for HRQoL as observed in Table 4 is 25.566 and so this constitutes a change of -3.042 (-0.119 x 25.566). Meaning anytime the depression level of the PWHB increases by a score of 3.660, there is a corresponding decrease in their HRQoL by a score of 3.042 especially if anxiety, individual and environmental characteristics are held constant. Despite this variation in the HRQoL of the PWHB, depression could not predict their HRQoL (β = -.119, t = -1.130, p > .05). Although depression had a negative and significant association with HRQoL, it failed to directly

predict HRQoL of the PWHB, giving an idea of a likely indirect prediction as indicated in the conceptual model. Therefore, the objective that depression will directly predict HRQoL was not realized for the current data.

Anxiety predicting HRQoL

Anxiety had an unstandardized b coefficient of (b = -2.031) with a t value of -3.170 showing that an increased score of anxiety led to a decrease of 2.031 scores in their HRQoL. To obtain the actual predictive value of the reduction the beta and the standard deviation for anxiety and HRQoL were assessed. Anxiety having a beta score of -.320 and standard deviation of 4.033 show that anytime anxiety increases by a standard deviation above the mean score, there is a corresponding -2.031 standard deviation decrease in the HRQoL of the PWHB. The actual standard deviation of HRQoL for the current data is 25.566 and so this constitutes -8.181 (-0.320 x 25.566). Therefore, anytime anxiety of the people increases by 4.033 standard deviation, the HRQoL of the people significantly decrease by 8.181 standard deviation (t = -3.170, p = .002). In effect, the outcome shows that anxiety as experienced by the PWHB predicted a reduction in their HRQoL. Meaning anxiety directly predicted the HRQoL of the PWHB in the Kumasi Metropolis.

Comparing the two psychological symptoms, anxiety levels had a stronger and larger direct predictive value (8.181) on HRQoL.

4.3.2.3 Predicting HRQoL by Functional Well-being and General Health perception

The fourth model containing the mediating variables, functional well-being and general health perception was significant ($F_{(18, 161)} = 7.905$, p =.000, ΔR^2 = .081) indicating 8.1 *percent* variation in HRQoL. The varying beta scores and t values greater than 1 show that functional well-being and general health perception had a significant but different contribution of the significant model observed in step 4.

Functional Well-being predicting HRQoL

Observing from step 4 in Table 4, the results showed that functional well-being predicted HRQoL of the PWHB (b = 1.353, β = .291, t = 2.908, *p* = .004) such that 5.509 standard deviation increase in functional well-being leads to 7.440 (.291 x 25.566) standard deviation of HRQoL. Meaning, functional well-being enhances the HRQoL of the PWHB by a significant standard deviation value.

General health Perception predicting HRQoL

General health perception predicted the HRQoL of the PWHB (b = 5.683, β = .172, t = 2.077, *p* = .039) such that 0.775 standard deviation increase in the general health perception of the people leads to a corresponding of 3.881 (.172 x 25.566) standard deviation increase in HRQoL.

To conclude, both mediators (functional well-being and general health perception) predicted HRQoL of the PWHB in Kumasi metropolis with functional well-being having a greater variation compared to general health perception.

Summary of objective Two

- Anxiety predicted a diminished HRQoL of PWHB.
- Depression did not predict H of PWHB.
- Functional well-being predicted an enhanced HRQoL of PWHB.
- General health perception predicted an enhanced HRQoL of PWHB.

4.3.3 Assessment of Objectives three, four and five.

Under this sub-section, three objectives were analyzed using series of hierarchical multiple regression and process model 6 for 2 mediators. Three main environmental variables (income, employment and education) which were dummy coded were included in the series of hierarchical multiple regression but for ease of presentation and understanding

only the predictive relationships necessary to adequately assess the objectives were presented in Table 5 Detailed series of analysis where the environmental variables included are placed in appendix H for reference.

Table 5: Summary of direct and indirect effect of the Predictor, Mediator and Criterion variables

Relationships	β	t	p
Direct relationships			
Depression ⟺ Functional	-.344	-4.230	.000
Anxiety ⟺ Functional well-being	-.273	-3.591	.000
Depression ⟺ General health perception	-.423	-4.272	.000
Anxiety ⟺ General health perception	-.051	-.551	.583
Depression ⟺ HRQoL	-.168	-1.650	.101
Anxiety ⟺ HRQoL	-.307	-3.213	.002
Functional well-being ⟺ General health perception	.597	8.783	.000
Functional well-being ⟺ HRQoL	.545	7.500	.000
General health perception ⟺ HRQoL	.455	6.442	.000
Indirect effect	Effect	LCI	UCI
Psychological symptoms: Depression			
Depression ⟹ Functional well-being ⟹ HRQoL	-.218	-.346	-.106
Depression ⟹ General health perception ⟹ HRQoL	-.032	-.083	.003
Depression ⟹ FWB ⟹ GHP ⟹ HRQoL	-.072	-.156	.003
Psychological symptoms: Anxiety			
Anxiety ⟹ Functional well-being ⟹ HRQoL	-.172	-.286	-.069
Anxiety ⟹ General health perception ⟹ HRQoL	-.009	-.050	.026
Anxiety ⟹ FWB ⟹ GHP ⟹ HRQoL	-.080	-.162	-.004

LCI=Lower Confidence Interval, UCI=Upper Confidence Interval; decision rule = 0.05 level of significance

Source: Field Data 2020

4.3.3.1 Examine the direct prediction of functional well-being by anxiety and depression

The results presented in Table 5 shows that depression predicted functional well-being (β = -.344, t = -4.230, p = .000) such that 3.660 standard deviation increase in depression led to 1.895 (-.344 x 5.509) decrease in the functional well-being of PWHB. That is depression had a direct prediction in the reduction of the functional well-being of the study population.

Anxiety also predicted functional well-being of the PWHB (β = -.273, t = -3.591, p = .00) such that an increase of 4.033 standard deviation of anxiety led to a corresponding decrease of 1.504 (-.273 x 5.509) standard deviation of functional well-being. Meaning anxiety reduced the functional well-being of the PWHB. To conclude, it is observed in the current study that, functional well-being of the PWHB was greatly affected by their depression and anxiety state.

4.3.3.2 Examine the direct prediction of general health perception by functional well-being

Functional well-being predicted general health perception of PWHB (β = .597, t = 8.783, p = .000) such that a 5.509 standard deviation increase in functional well-being led to a corresponding increase of .463 (.597 x .775) standard deviation in the general health perception. Meaning, functional well-being fosters the way PWHB rate their health in general.

4.3.3.3 Examine the indirect effect of depression and anxiety on HRQoL through functional well-being and general health perception

From Table 5, results showed that there is a significant indirect or mediation effect of depression on HRQoL through functional well-being (effect = -218, $p < .05$). Initial analysis examining the prediction of HRQoL by depression was not significant (β = -.168,

t = -1.650, p = .101) after income, education, and employment have been controlled for. This result means that among the sample studied, depression could not directly explain the variance in the HRQoL of the PWHB but was significantly explained through a reduction in the functional well-being. That is, before depression will have a significant and negative impact on the HRQoL of the people, it must first have a negative impact on their functional well-being. The indirect prediction of HRQoL by depression through general health perception was not supported (effect = -.032, p > .05). Also, the indirect prediction of HRQoL by depression through functional well-being and general health perception was not supported by the current data (effect = -.072, p > .05).

The indirect prediction effect of anxiety on HRQoL through functional well-being was supported (effect = -.172, p < .05). That is, functional well-being significantly explained the relationship between anxiety and HRQoL. In addition, the relationship between anxiety and HRQoL was significantly explained through functional well-being and general health perception (effect = -.080, p < .05). However, the relationship between anxiety and HRQoL was not explained by general health perception. The result show that anxiety has three pathways to decrease the HRQoL of the PWHB. First, anxiety as a variable have enough strength in predicting a reduced form of HRQoL. Secondly, anxiety reduces HRQoL though a reduction in the functional well-being of the people. Third, anxiety reduces HRQoL of the people studied by first reducing their functional well-being and general health perception.

4.4 Summary (Observed Model)

The diagram in figure 2 is the final observed model realized after analysis of the stated objectives. From the model depression and anxiety measuring psychological symptoms were positively correlated. Both depression and anxiety negatively predicted functional well-being. Depression negatively predicted general health perception whilst anxiety negatively predicted HRQoL. In addition, functional well-being predicted both general

health perception and HRQoL and general health perception predicted HRQoL. Functional well-being mediated the relationship between depression, anxiety and HRQoL. Finally, functional well-being and general health perception mediated the relationship between anxiety and HRQoL.

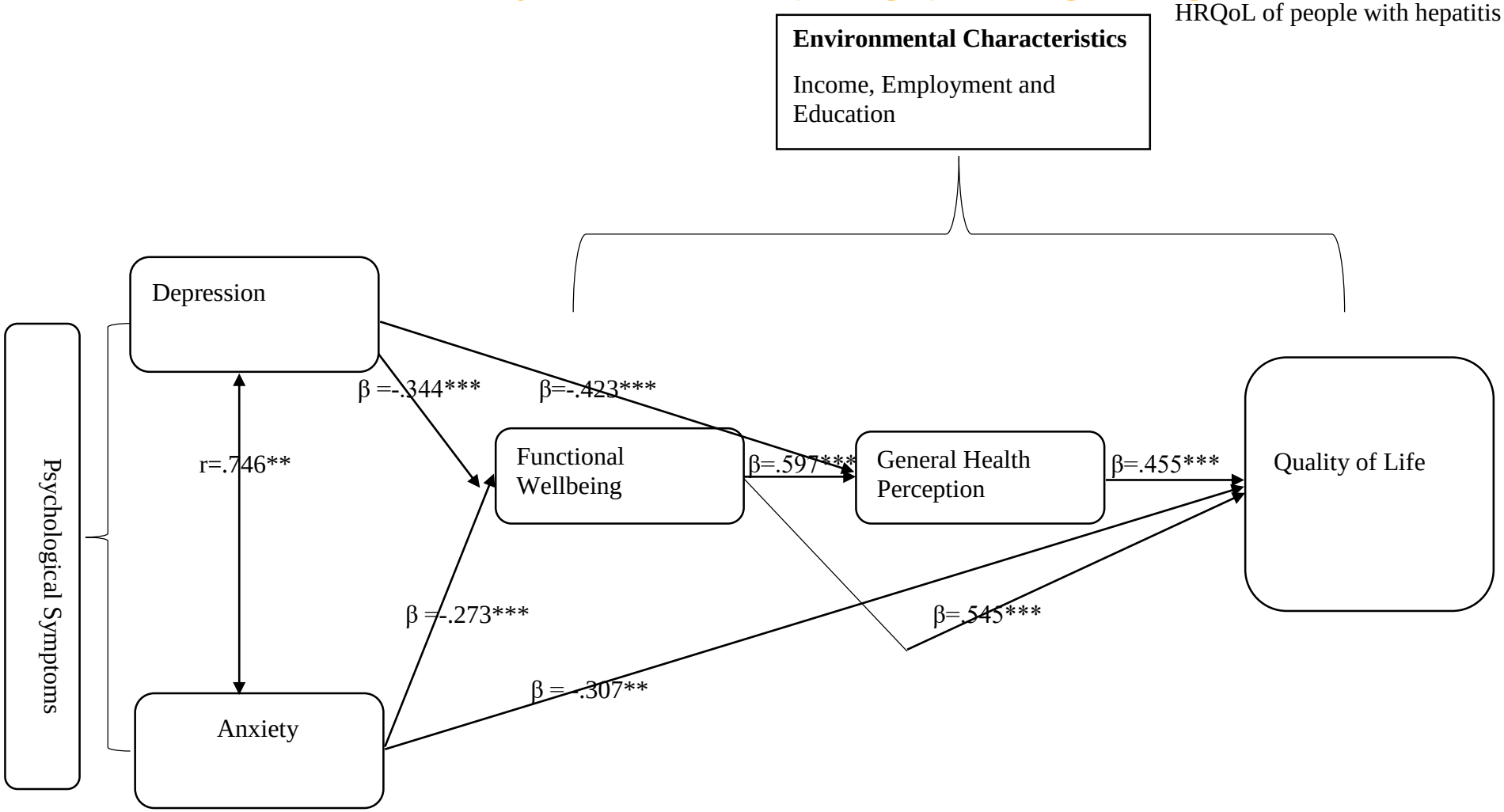


Figure 2: Mediation model of HRQoL

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.0 Introduction

The chapter discusses the findings of the study within the context of literature. Highlights of the key findings are first summarised followed by a discussion on individual and environmental characteristics of the study population. Finally, each outcome of health and its associations are discussed.

5.1 Summary

The study is one of a few worldwide to assess the QoL of PWHB using the HRQoL model proposed by Wilson and Cleary (1995) and revised by Ferrans et al. (2005). The study sought to assess the QoL of PWHB by describing the effects of the health outcomes of PWHB on their QoL. The findings of the study forms a baseline data for the quantitative studies of the QoL of PWHB in Ghana. Overall, the study reveals that three quarters of PWHB in the Kumasi metropolis have a lowered QoL. All health outcomes (anxiety and depression representing psychological symptoms, functional well-being, general health perceptions and QoL) in the model were significantly associated. Both depression and anxiety accounted negatively for functional well-being. Depression negatively explained general health perception whereas anxiety negatively explained QoL. Additionally, functional well-being accounted positively for both general health perception and QoL. Likewise, general health perception positively predicted QoL. Functional well-being mediated the relationship between depression, anxiety and HRQoL. Finally, functional well-being and general health perception mediated the relationship between anxiety and QoL.

5.2 Individual and environmental characteristics of PWHB

The study included individual and environmental characteristics in the hierarchical multiple regression model for the direct prediction of QoL. Individual characteristics in the

model accounted for 5.2 *percent* variation in the QoL of PWHB. Nevertheless, it could not significantly predict their QoL. Environmental characteristics consisting of variables such as income, education and either being on or off antiviral therapy was significant in the study and explained 23.6 *percent* of the variation in QoL.

The study findings revealed that almost half of the respondents are within the ages 31 to 40 years. Ofori-Asenso and Agyeman (2016) in their systematic review that sought to document hepatitis B prevalence in Ghana, identified the study respondents aged between 16 to 39 years as having the highest prevalence of chronic hepatitis B in Ghana. This age group falls within the working age group (The Organisation for Economic Co-operation and Development, 2014) and may have economic and health implications for Ghana. Like the study by Karacaer et al. (2016), age failed to significantly predict the QoL of PWHB in this present study. However, it is important to note that the findings of the study suggest that people above 50years are more likely to suffer a reduced QoL as reported by other studies in china, Italy, and Vietnam (Li et al., 2018; Simonetti et al., 2018; Vu et al., 2019). The evaluation of QoL should be routine for PWHB above 50 years with appropriate support to improve their QoL when necessary.

More than half of the study respondents were men. Females are generally known to delay health-seeking because of possible lack of support when they suffer chronic illness (Ngo et al., 2019; Vlassoff, 2007). Again in developing countries such as Ghana, reasons for the delay in healthcare by females include the multiple domestic responsibilities women have which may prevent them from seeking care from health facilities during working hours (Vlassoff, 2007). Thus, women may tend to first self-medicate or seek alternative healthcare more often in Ghana (Asamoah, 2019; Gbadago, 2017). No significant relationship between the QoL of PWHB and sex was identified in this present study.

Also, a little more than half of the respondents in the present study were married. Other studies have documented that married people are likely to enjoy a better QoL because they may have both emotional and financial support from their spouses (Karacaer et al., 2016; Ngo et al., 2019) whiles others found being married to rather decrease QoL because of heightened depressive symptoms (Hassani et al., 2017; Vu et al., 2019). However, this study findings did not show any significant relationship between marital status and the QoL of PWHB.

This present study further established that educational level has a negative significant effect on QoL. This finding corroborates findings from Kim et al. (2015) study conducted in Korea that showed a lower QoL among educated PWHB. Highly educated patients may be in formal employment but the fear of losing jobs following disclosure of their hepatitis B positive status can potentially contribute to lowered QoL particularly in Ghana (Adjei et al., 2020). Further, the ability of the educated chronic hepatitis B patient to understand the nature of the hepatitis B infection including its associated complications such as liver cirrhosis and liver cancer can generate increasing anxieties that may consequently affect their QoL negatively (Hajarizadeh et al., 2016). Contrastingly, higher levels of education was found to be associated with better QoL for hepatitis B patients in North America and in India (Balasundaram et al., 2019; Evon et al., 2020).

The financial implications of chronic hepatitis B infection is well documented in literature outside Ghana (Ansari et al., 2019; Deshpande et al., 2016; Nguyen et al., 2019; Zhang et al., 2016) and within Ghana (Adams, 2017; Adjei et al., 2019a; Ofori-Asenso & Agyeman, 2016). Although, no study has documented the cost of care of hepatitis B in Ghana, evidence in China indicate that, Chinese with chronic hepatitis B spend about 206.5% of their annual salary directly on care for hepatitis B (Zhang et al., 2016). Also, PWHB identified high cost of treatment and care of chronic hepatitis B as a barrier to

assessing formal healthcare in Ghana (Adjei et al., 2019a)**.** In this current study, 63.90 *percent* of the respondents were in full time employment and earned a monthly income of GH₵ 350 (monthly minimum wage in Ghana) or below (equivalent to $63.6 or below). Monthly income levels above GH₵ 1050 (equivalent to $190.8 or above) predicted a better HRQoL compared to those who earned a monthly income of GH₵ 350 or lower in the study findings. Ghanaians living with chronic hepatitis B are responsible for the cost of healthcare. As such, patients earning a monthly income of GH₵ 350 or below may find it extremely onerous to cope with the high cost of monitoring and treatment of hepatitis B (Adjei et al., 2019a), hence its effect on their QoL. Similar findings of higher family income associating positively with improved QoL was found in the Korean Population (Kim et al., 2015).

Again, the study showed that those on antiviral therapy for hepatitis B had a significantly lower QoL compared to those not on antiviral therapy for hepatitis B. Antiviral therapy may help to improve physical symptoms (Cimolai, 2019; Xue et al., 2017), which may subsequently help to improve QoL (Ferrans et al., 2005). However, the high cost of the antiviral therapy and the side effect of some of the antiviral medications may have a negative effect on patient's psychological health thereby compromising QoL (Adjei et al., 2019a; Xue et al., 2017; Yilmaz et al., 2016). Similarly, Xue et al. (2017) found that psychological symptoms (which may have a negative effect on QoL) in PWHB improved only after antiviral therapy for hepatitis B infection had been discontinued.

5.3 Depression among PWHB

The study findings demonstrated that depression negatively predicts the functional well-being of PWHB. Several studies have confirmed the negative effect of psychological symptoms of PWHB on daily functioning (Evon et al., 2016; Jang, Boo, et al., 2018; Simonetti et al., 2018; Yilmaz et al., 2016). For instance, depression negatively associated with functioning when the impact of depression and anxiety on the functionality of PWHB

was investigated in Turkey (Yilmaz et al., 2016). Furthermore, the functional well-being scale evaluated the ability to work and sleep well (Cella et al., 1993). Thus, the results suggests that PWHB who are depressed may not be able to work and sleep well as part of experiencing lowered functioning. Perhaps, depressed PWHB may be preoccupied by the negative perceptions that makes them depressed thereby preventing them from concentrating on work and sleeping soundly (Simonetti et al., 2018; Tana, Alao, Morris, Bernstein, Hattenbach, Rehman, Brychta, Sarkar, Zhao, Walter, et al., 2018).

This study's results also showed a lowered projection of general health perception by depression. Some PWHB are known to have negative attitudes toward their health (Ansari et al., 2019; M. Liu et al., 2017). Probably the negative experiences that brings depression such as witnessing the fatal experiences of others with hepatitis B may account for such ill perception about health (Adjei et al., 2017; Taheri Ezbarami et al., 2017). PWHB in Ghana who are depressed may probably redraw from the usual religious, family, political, and workplace gathering leaving them isolated and giving enough time alone to form negative perceptions about health.

Despite the above findings, depression had only one pathway significantly predicting QoL in the present study. Depression failed to predict QoL directly in the study findings even though most studies of depression in chronic hepatitis B documents depression as a significant direct predictor of QoL (Li et al., 2018; M. Liu et al., 2017; Ngo et al., 2019; Ojelabi, Graham, Haighton, Ling, & outcomes, 2017). However, it is important to note that most of these study samples included PWHB who experienced disease complications or were living with other chronic diseases (Li et al., 2018; M. Liu et al., 2017; Ngo et al., 2019). The QoL of PWHB was only significantly predicted by depression through functional well-being in this present study. Notably, PWHB without complications or comorbidities may not experience severe depression which can independently predict

their QoL (Evon et al., 2020; Terrault et al., 2018; Yilmaz et al., 2016). Contrasting results are found in the work of Simonetti et al. (2018) done in Italy where depression in uncomplicated hepatitis B patients without comorbidities significantly predicted QoL in the univariate analysis but failed to be a significant predictor of QoL in the multivariate analysis.

Depression significantly explained the QoL of PWHB through their functional status. Thus, depression would affect the QoL of PWHB only when it negatively affects their functioning. This finding underscores the importance participants place on functional well-being. Healthcare services should include strategies to assess and improve the functional well-being of PWHB.

5.4 Anxiety among PWHB

First, anxiety significantly predicted lowered functional well-being in this study results. PWHB who experience anxiety are more prone to fatigue which affects daily activities (Evon et al., 2016; Simonetti et al., 2018). Fatigue has been generally documented in the lives of liver patients and may alter functioning in its severe form (Evon et al., 2016; Jang, Kim, et al., 2018; Swain & Jones, 2019; Tana, Alao, Morris, Bernstein, Hattenbach, Rehman, Brychta, Sarkar, Zhao, & Walter, 2018). Yilmaz et al. (2016) explained the decrease in the functioning of anxious PWHB to be influenced by social isolation that is related to the fear of infecting other people. The low knowledge of hepatitis B in Ghana may exacerbate the anxieties of PWHB (Abdulai et al., 2016; Adoba et al., 2015; Afihene et al., 2017), and likely lower functioning (Ferrans et al., 2005). Anxiety failed to significantly predict the health perceptions of PWHB.

Interestingly, anxiety predicted the QoL of PWHB in three pathways. That is, anxiety significantly predicted QoL through functional well-being, through functional well-being and general health perceptions and directly. The factors that could promote negative feelings of PWHB in Ghana may be enormous. For example, there is an established low knowledge

of hepatitis B infection (Abdulai et al., 2016; Adade, 2016; Afihene et al., 2017), stigmatization of people living with hepatitis B (Adjei et al., 2019b) and the high cost of treatment in Ghana (Adjei et al., 2019a; Ofori-Asenso & Agyeman, 2016). These multiple influences may increase anxiety and consequently diminish QOL. In Australia, negative feelings of hepatitis B patients were mainly generated from extreme concerns about developing liver cancer and transmitting hepatitis B to others (Hajarizadeh et al., 2016).

5.5 Functional well-being of PWHB

The study findings revealed functional well-being accounting for a better general health perception and QoL. Literature has proof of poor HRQoL linked to poor functioning as a result of fatigue (Evon et al., 2016; Zhong et al., 2019). For instance, physiological QoL correlated negatively with fatigue among Chinese (Zhong et al., 2019). More than half of the study participants (63.9%) were in fulltime employment thus, an inability to function well at work may present a possible risk of loss of employment or an inability to operate business as most Ghanaians are self-employed usually in one man businesses. Also, a reduction in functional well-being may be translated as a reduction of income for PWHB who may be operating their own businesses. As a result PWHB may be unable to fully cater for their personal and medical needs thereby compromising their health ratings and QoL.

5.6 General Health Perception of PWHB

The study demonstrated that general health perceptions accounted for an improved HRQoL. The health perceptions of HIV patients also correlated positively with HRQoL during an evaluation of the HRQoL model with structural equation modelling (Sousa & Kwok, 2006). Again, a systemic review of the application of the HRQoL model by Wilson and Cleary (1995) in chronic diseases (Ojelabi et al., 2017) revealed a consistent positive influence of general health perceptions on HRQoL. PWHB with poor health perceptions

may have reduced HRQoL because they may also have reduced satisfaction of the state of their lives.

5.7 Health-related Quality of life of PWHB

The study findings revealed that 75% of the PWHB in the Kumasi metropolis had a low HRQoL. The study of the QoL of PWHB without complications in Italy and India generated comparable results (Ansari et al., 2019; Simonetti et al., 2018). The observed model in this present study, explained 46.9% of all the variance in the QoL of PWHB. Individual characteristics explained 5.2% of the variance in QoL but could not significantly predict HRQoL. On the other hand, several studies have had such characteristics as age. Sex and marital status significantly predicting QoL of PWHB (Li et al., 2018; Ngo et al., 2019; Vu et al., 2019). The observed model revealed that, environmental characteristics specifically, monthly income above GH¢1050, education and being on antiviral therapy for hepatitis B accounts for 23.6% of the variation in QoL. The QoL of PWHB in the Kumasi metropolis is largely affected by environmental characteristics. Similar literature exist where education, income, and antiviral therapy for PWHB helped to shape QoL (Vu et al., 2019; Wallace et al., 2017; Xue et al., 2017).

Anxiety and depression explained approximately 9.9% of the variation in QoL. The psychological symptoms again significantly predicted the HRQoL of PWHB. The influence of anxiety and depression in chronic hepatitis B patients cannot be overemphasized (Balasundaram et al., 2019; Fındıklı et al., 2017; Karlidağ & Atmaca, 2019; Liu et al., 2017; M. Liu et al., 2017; Simonetti et al., 2018; Xue et al., 2017). Anxiety and depression have been recorded in different populations of PWHB (Hajarizadeh et al., 2016; Karacaer et al., 2016; Liu et al., 2017) and noted to be one of the strongest predictors of QoL for PWHB (Li et al., 2018; M. Liu et al., 2017; Ngo et al., 2019). For example, major depression among PWHB in China was about 4.8% higher than the Chinese general population (Liu et al.,

2017). Also in Vietnam, anxiety and depression associated with compromised QoL among PWHB (Ngo et al., 2019).

Furthermore, the mediators in the HRQoL model by (Ferrans et al., 2005), that is functional well-being and general health perceptions contributed about 8.1% variation in QoL. There is evidence of the influence of functional well-being and general health perception on the QoL of PWHB in literature (Evon et al., 2016; Jang, Kim, et al., 2018; Swain & Jones, 2019; Tana, Alao, Morris, Bernstein, Hattenbach, Rehman, Brychta, Sarkar, Zhao, & Walter, 2018; Zhong et al., 2019). For instance, Zhong et al. (2019) found fatigue to be associated with reduced functioning that subsequently reduced QoL among Chinese whiles the QoL of PWHB increased when their health perceptions were improved through education on chronic hepatitis B (Tian et al., 2017).

5.8 Summary

In conclusion, the QoL of PWHB are influenced by all the constructs in the HRQoL model by Wilson and Cleary (1995) and modified by Ferrans et al. (2005). Essentially, we established that the constructs in the model are not only related in a dominant linear relationship but health outcomes such as anxiety, depression, and functional well-being have a direct significant relationship with QoL. Also, environmental characteristics have major influences on QoL of PWHB. Other factors that could affect QoL like culture, religion, and family support could be investigated in future studies to further understand the QoL of PWHB.

CHAPTER SIX

SUMMARY, IMPLICATIONS, LIMITATIONS, RECOMMENDATIONS AND CONCLUSION

6.0 Introduction

The chapter is the final for the study. A summary of the work is presented with implications and the encountered limitations. Recommendations based on the findings of the study are made with a conclusion.

6.1 Summary of the study

Chronic hepatitis B infection affects about 257 million people globally (World Health Organisation, 2020). In the year 2015, about 887,000 deaths were associated to hepatitis B infection and its complications (World Health Organisation, 2020). Markedly, hepatitis B infection is highly endemic in areas such as Africa and western pacific regions, (Kim & Kim, 2018; World Health Organisation, 2019).

Several psychological challenges accompany chronic the hepatitis B infection (Adjei et al., 2017; Huang et al., 2016; Kim et al., 2015; Vu et al., 2019). For instance, PWHB face psychological pressures such as shame, sadness, and fear of experiencing the complications of hepatitis B infection (Adjei et al., 2017; Huang et al., 2016). Such psychological stresses may affect the ability of an individual to work well physically or mentally, influence perceptions about health, and compromise QoL in general (Ferrans et al., 2005).

The hepatitis B infection remains a threat in Ghana with a prevalence rate of 12.3% (Ofori-Asenso & Agyeman, 2016). Regardless of this high prevalence rate, majority of Ghanaians have low knowledge about hepatitis B (Abdulai et al., 2016; Adoba et al., 2015; Afihene et al., 2017). The evidence of psychosocial challenges and financial stress as a result of the cost of treatment compounds the situation for PWHB in Ghana (Adams, 2017; Adjei et al., 2017). However studies of hepatitis B in Ghana has been focused on hepatitis B

knowledge, prevalence, and the challenges PWHB face (Abdulai et al., 2016; Adade, 2016; Adjei et al., 2017; Adoba et al., 2015; Afihene et al., 2017; Ofori-Asenso & Agyeman, 2016). There seems to be no evidence of the assessment of QoL of Ghanaians living with hepatitis B in literature.

The major objective was to assess the QoL of PWHB and was guided by the HRQoL model by Wilson and Cleary (1995) and revised by Ferrans et al. (2005). The model states that, health outcomes have a linear dominant causal relationship. As such, biological function (health outcome not assessed) affects symptoms, symptoms affect functional well-being, functional well-being affects general health perception, and general health perception affects QoL (Ferrans et al., 2005; Wilson & Cleary, 1995). The HRQoL model revised by Ferrans et al. (2005) also states that health outcomes are influenced by a person's individual and environmental characteristics. As part of the objectives, each outcome of health, its associations, and direct or indirect predictions in the model were assessed.

A cross-sectional design was used to obtain data from 183 patients living with chronic hepatitis B and accessing care from the Komfo Anokye teaching hospital in Kumasi. A combination of the consecutive and quota non- probability sampling techniques were used to select participants for the study. The questionnaires adopted for the study were standard with satisfactory reliability coefficients and suited the objectives for the study.

The study instrument used is a combination of the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983), the Functional Well-Being Scale from the Functional Assessment of Non-Life-Threatening Conditions (FANLTC) (Cella et al., 1993), the 'excellent to poor' self-rated health item (Hays et al., 2015), the Hepatitis B HRQOL Instrument Version 1.0 developed by Spiegel et al. (2007), and questions that assessed the individual and environmental characteristics.

Ethical clearance was obtained from Institutional Review Boards (IRB) of the Ghana Health Service and the Komfo Anokye teaching hospital. Permission from the management of the hospital and the gastroenterology clinic was attained with introductory letters from the University of Ghana, School of Nursing and Midwifery. Participants were informed about the study and both oral and written consent given before participating in the research. Patients were informed about their right to withdraw from the study at any point in time if they felt so. Participants were kept anonymous as no information that could be a tracer (for example, names, folder numbers, and telephone numbers) was collected. All information from participants are kept under lock and key in a drawer and the soft copies saved with a password.

Data analysis was done using the SPSS version 23.0. A total of 180 participants were used for the analysis as 2 participants failed to adequately complete the questionnaire. First, frequencies and percentages were used to assess the individual and environmental characteristics and the QoL of the respondents. Secondly, skewness, kurtosis, mean, standard deviation, Pearson r, and Cronbach's Alpha were used to assess descriptive statistics (normality, reliability, and inter-correlations among study variables). Finally, hierarchical multiple regression and *Sobel test* of significant indirect effect were used to assess the study objectives.

The findings or the current study revealed that 75 *percent* of PWHB have a lowered QoL whiles their health outcomes in the model associated significantly. Both depression and anxiety accounted for a reduced functional well-being. Depression negatively predicted general health perception whereas anxiety explained a compromised QoL. Additionally, functional well-being accounted for an enhanced general health perception and QoL. Also, general health perception positively predicted QoL. Functional well-being mediated the

relationship between depression, anxiety and HRQoL. Finally, functional well-being and general health perception mediated the relationship between anxiety and QoL.

Again, the constructs in the observed model explained about 46.9% of the variation in the QoL of PWHB. Remarkably, environmental characteristics alone accounted for 23.6% of the total variations in the QoL of chronic hepatitis B patients. This shows that environmental characteristics of chronic hepatitis B patients in the Kumasi metropolis have a major influence on their QoL.

The observed model confirms the HRQoL model by Wilson and Cleary (1995) and revised by Ferrans et al. (2005) with little modifications. However, we established several other significant relationship in the model that suggests that health outcomes are not only related linearly. Future research should involve the investigation of these relationships.

6.2 Implications of the study

The study findings have implications for health service providers, public health, policymakers and future research.

6.2.1 Health service providers

Health workers must have continuous education especially in scientific seminars to properly understand the patients they care for. Several aspects of the model significantly predicted the QoL of PWHB in the Kumasi metropolis. Health care workers should first understand the areas that can alter the QoL of PWHB and plan care to meet the needs of the client in order to enhance QoL.

6.2.2 Public health

Public education on chronic hepatitis B is important and urgently needed to improve the perception of Ghanaians about chronic hepatitis B and improve the QoL of people living with chronic hepatitis B in Ghana. Public education on chronic hepatitis B through the

media, should be intensified. Inaccurate information on chronic hepatitis B that is spread by unprofessional herbal practitioners and quack doctors should be traced and stopped.

6.2.3 Policymakers

The current study suggest that policy formulation should focus on lessening the financial burden of chronic hepatitis B, routine counselling of PWHB and the general public on the prevention of hepatitis B.

6.2.4 Future research

Further research is needed in the assessment of the QoL of chronic hepatitis B patients in other aspects of the HRQoL model by Wilson and Cleary (1995) and revised by Ferrans et al. (2005) other than those already assessed in this study. This would help to further understand the other factors contributing to the QoL of chronic hepatitis B patients in Ghana.

6.3 Limitations of the study

The study has been restricted within the following boundaries:

1. The HRQoL model by Ferrans et al. (2005) describes an actual causal relationship between health outcomes however, the study gave a description of the relationships of the health outcomes and not causal effects. This is so because the study used a cross-sectional design that limits the establishment of a cause and effect relationship.
2. The non-probability sampling technique does not allow generalization of the results of this study to all PWHB in Ghana.
3. The study did not consider the type of antiviral therapy PWHB were on in the present study. The QoL of PWHB could be influenced by the side effects of some of the antiviral medications.
4. PWHB who had developed complications like cirrhosis and liver carcinoma were exempted from the study hence the findings does not include their assessment.

5. Patients were recruited from the hospital, hence the findings cannot be generalised to PWHB who do not seek formal healthcare.

6.4 Recommendations

Considering the findings of the study, a few recommendations are made to the stake holders of health in Ghana.

6.4.1 The Ministry of Health

The Ghanaian health ministry should:

1. Develop a policy to include chronic hepatitis B treatment and monitoring in the NHIS.
2. Develop a policy framework for the routine counselling of chronic hepatitis B patients.
3. Institute a comprehensive educational program by qualified health professionals for PWHB.
4. Institute pre-test and post-test counselling of PWHB in the health delivery system to allay the anxiety and depression that characterise hepatitis B diagnosis by integrating hepatitis B services with the existing HIV structures.

6.4.2 Komfo Anokye Teaching Hospital

Based on the findings of the study, we recommend that the staff at the gastroenterology clinic should:

1. Organize regular in service training for the staff at gastroenterology clinic on understanding and improving the QoL of PWHB.
2. Provide post-test counselling for all chronic hepatitis B patients.
3. Form patient support groups to help chronic hepatitis B patients share their experiences and learn from each other.
4. With patient consent, involve relatives in the care of PWHB for support.

5. Assess QoL routinely for all PWHB assessing health care.

6.4.3 Future research

From the findings of the study, further investigations into the QoL of chronic hepatitis B patients should include:

1. Assessment of the effects of antiviral therapy on chronic hepatitis B patient's psychological status and HRQoL.
2. Investigations of how other aspects of the model such as physical symptoms, mental functioning, religion, culture, and support from family and healthcare givers affect QoL.
3. Investigations of the reverse relationships in the health outcomes in the HRQoL model by Wilson and Cleary (1995) and revised by Ferrans et al. (2005).

6.5 Conclusion

The study has assessed and found the QoL of PWHB to be generally low. Findings from the study confirms the HRQoL model by Wilson and Cleary (1995) and revised by Ferrans et al. (2005) although with other linkages established. Environmental characteristics including monthly income, education and being on antiviral therapy for hepatitis B infection had major influences on QoL of PWHB. We recommend that PWHB in Ghana are financially supported and an intense national education on chronic hepatitis B commenced.

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APPENDICES

Appendix A: Introductory letter from supervisor

UNIVERSITY OF GHANA
DEPARTMENT OF COMMUNITY HEALTH NURSING
SCHOOL OF NURSING

Ref. No.:...10262802..... November 11, 2019

The Director
Research and Development Unit
Komfo Anokye Teaching Hospital
Kumasi.

Dear Sir/Madam,

LETTER OF INTRODUCTION

I write to introduce to you Pearl Esi Thompson, an MPhil second year student of the School of Nursing and Midwifery.

The Scientific Review Committee of the School has approved the thesis topic: **"Health –Related Quality of Life of People with Chronic Hepatitis B in the Kumasi Metropolis.".**

I hope that the Ethical Review Committee will consider the proposal to enable her collect data.

Counting on your usual co-operation

Thank you.

Yours faithfully,

Dr. Lilian Akorfa Ohene
Supervisor

COLLEGE OF HEALTH SCIENCES
• P. O. Box LG 43, Legon, Accra, Ghana. • **Telephone:** +233 (0) 302 513 250 / 0289 531 213
• **Email:** communityhealth.son@chs.ug.edu.gh • **Website:** www.nursing.ug.edu.gh

Appendix B: Introductory letter from Co-supervisor

UNIVERSITY OF GHANA
DEPARTMENT OF COMMUNITY HEALTH NURSING
SCHOOL OF NURSING

Ref. No.:...10262802..... November 11, 2019

The Director
Research and Development Unit
Komfo Anokye Teaching Hospital
Kumasi.

Dear Sir/Madam,

LETTER OF INTRODUCTION

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I hope that the Ethical Review Committee will consider the proposal to enable her collect data.

Counting on your usual co-operation

Thank you.

Yours faithfully,

Mr. Charles Ampong Adjei
Co-Supervisor

COLLEGE OF HEALTH SCIENCES
• P. O. Box LG 43, Legon, Accra, Ghana. • **Telephone:** +233 (0) 302 513 250 / 0289 531 213
• **Email:** communityhealth.son@chs.ug.edu.gh • **Website:** www.nursing.ug.edu.gh

Appendix C: Ethics Approval from Komfo Anokye Teaching Hospital

KOMFO ANOKYE TEACHING HOSPITAL

RESEARCH AND DEVELOPMENT UNIT (R & D)

CERTIFICATE OF REGISTRATION

REG. NO: RD/CR19/242

This is to certify that

Prof/Dr/Mrs/Mr/Ms Thompson Pearl Esi

has registered his/her proposed study titled Health-Related Quality of Life of People with Chronic Hepatitis B in Kumasi Metropolis

..... with the Research and Development Unit.

Date: 03-December-2019

Name of issuing officer: Mr. Isaac Boakye

Signature: .....

K/19/0313286 *

*Receipt number must tally with pay-in slip from the bank

Note

This certificate does not constitute ethical clearance for the conduct of the study but proof of registration of study with KATH. Ethical clearance from the KATH Institutional Review Board (KATH-IRB) is required to conduct the study at KATH.

Version RD/REG-19TH NOVEMBER, 2019

Please note: All previous versions of the certificate of registration becomes obsolete

Form expires *31ST DECEMBER, 2020*

KOMFO ANOKYE
TEACHING HOSPITAL

P. O. Box 1934
KUMASI - GHANA
Tel: +233 - 3220 - 22301- 4
Fax: +233 - 3220 - 24654/24621
Website: www.kathhsp.org

Our Ref. No:*KATH-IRB/AP/002/20*

Your Ref. No:.....

Komfo Anokye Teaching Hospital Institutional Review Board

17th February 2020

Miss Pearl Esi Thompson,
Community Health Department,
School of Nursing and Midwifery,
University of Ghana, Legon.
Accra.

Dear Miss. Thompson,

Ethics Approval

Protocol title:	Health-related quality of life of people with chronic hepatitis B in the Kumasi Metropolis
Study site:	Gastroenterology clinic of Komfo Anokye Teaching Hospital, and Kumasi South Hospital, Kumasi, Ghana.
Sponsor:	Self-funded

We are writing in response to the clarifications and revised documents following review by the Komfo Anokye Teaching Hospital Institutional Review Board (KATH-IRB) in respect of the research study referenced above.

We are pleased to inform you that KATH IRB, per your correspondence of 7th February 2020, has given approval for the following study documents:

- *Protocol version 3 last updated 7th February 2020*
- *Informed Consent Form version 3 last updated 7th February 2020*
- *Case Report Form version 3 last updated 7th February 2020*

Approval for the study is in effect until **16th February 2021** and it is the responsibility of the Principal Investigator to maintain the study in good standing at the Komfo Anokye Teaching Hospital. The Board anticipates to be notified of the actual start date of your project.

Prior to the expiration of the study approval, you must submit to the KATH-IRB an "Application for Continuing Review" along with provision of "Annual Report" when the study is ongoing, or a "Termination Report" if the research has been completed.

You must hastily report to the KATH-IRB should a modification to the research be proposed, and without delay if an unanticipated development occurs before the next required review. Regulations do not permit you to modify conduct of the study in its present form prior to ethics

approval; except where urgent action is required to eliminate an apparent immediate hazard to a study subject or other person. It is of utmost importance data generated from this study must be used for the intended purposes only.

Thank you.

Sincerely,

Prof. Kwabena Antwi Danso, BSc, MB ChB, FWACS, FGCS, FACOG
Chairman, KATH-IRB

Appendix D: Ethics Approval form Ghana Health Service

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

In case of reply the number and date of this Letter should be quoted.

MyRef. GHS/RDD/ERC/Admin/App/19/636
Your Ref. No.

Research & Development Division
Ghana Health Service
P. O. Box MB 190
Accra
GPS Address: GA-050-3303
Tel: +233-302-681109
Fax + 233-302-685424
Mob + 233- 050-3539896
Email: ethics.research@ghsmail.org

22nd November, 2019

Pearl Esi Thompson
University of Ghana
School of Nursing and Midwifery
Community Health Department
Legon - Accra

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

GHS-ERC Number	**GHS-ERC038/11/19**
Project Title	Health-Related Quality of Life of People with Chronic Hepatitis B in the Kumasi Metropolis
Approval Date	22nd November, 2019
Expiry Date	21st November, 2020
GHS-ERC Decision	**Approved**

This approval requires the following from the Principal Investigator

- Submission of yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months,
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report **after completion** of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.

Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....
Dr. Cynthia Bannerman
(GHS-ERC Chairperson)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra

Appendix E: Participants Information Sheet

PARTICIPANTS INFORMATION SHEET

Topic: **Health-related quality of life of people with chronic hepatitis B in the kumasi metropolis**

Principal investigator: Pearl Esi Thompson, MPhil nursing student.

Address: School of Nursing, College of Health Sciences, University of Ghana.

email; pethompson@st.ug.edu.gh **Tel:** +233 244043592

Background and Purpose of research: Chronic hepatitis B virus infection is a public health concern with about 257 million people living with the disease worldwide. In Ghana, reports show that the number of people living with the disease is about 12.3 % of the country's total population. Researchers have published the psychological and financial stress that people who live with chronic hepatitis B virus infection go through in the country. The health system in Ghana has implemented some of the interventions the world health organization has recommended for people with chronic hepatitis B virus infection. Knowing the possible changes that chronic hepatis B virus infection presents in a person's life, this research seeks to find out how satisfied people with chronic hepatitis B virus infection are with their lives in the Kumasi metropolis.

Nature of research: the study seeks to describe how satisfied people with chronic hepatitis B virus infection are with their lives in the country. It will describe how psychological issues affect the well-being of people with chronic hepatitis B virus infection and state the things that are likely to determine the satisfaction of a person living with chronic hepatitis B virus infection. The study will take place in the Komfo Anokye Teaching Hospital and the Kumasi South Hospital, all in the Kumasi metropolis.

Participants involvement:

Duration and what is involved: If you consent to be part of the study, you would be taken through the signing of the consent form and you would be given a questionnaire that could take you about 60 minutes to answer. Where needed an interpreter would help you to answer the questions. You would not be forced to answer any question you may feel uncomfortable to

answer. A total number of 183 persons living with chronic hepatitis B virus infection would be recruited to complete the study

Potential Risks: The research anticipates no harm to the participants in the study.

Benefits: There are no direct benefits that the participants will get from the study though the findings from the study would help health care providers to improve the kind of services they give and also help policy makers to put in place policies that can better the lives of people who live with chronic hepatitis B virus infection.

Costs: The cost of the study will be the sole responsibility of the researcher. The researcher would meet the participants as they visit the hospitals and they would not be required to travel for the research. The stationary for the work will be provided by the researcher.

Compensation: Participating in this research work is voluntary and does not come with any compensation.

Confidentiality: Apart from the principal investigator, the research assistants and the supervisors for the study, no other person will have access to the questionnaires. You will not be required to put your names, telephone numbers and signatures on the questionnaire. You will also not be required in the future to answer or explain the answers you give in the questionnaire.

Voluntary participation/withdrawal: You are at liberty to decide to join this study or not. If you decide to join the study, you will be at liberty to withdraw any time within the study if you are no longer comfortable with the questionnaire. This will have no repercussions whatsoever on you.

Outcome and Feedback: The data from the study will be analyzed and the finding will be published for the benefit of the public.

Funding information: The researcher alone is funding this study.

Provision of Information and Consent for participants: Each participant will be given an information sheet and a copy of the consent form to keep.

For Further Clarification/Questions Contact;
Pearl Esi Thompson
School of Nursing and Midwifery
University of Ghana, Legon
Contact number: 0244043592
Email: pethompson@st.ug.edu.gh

For Ethical Issues and Rights To Participation Contact:
Institutional Review Board
Komfo Anokye Teaching Hospital
Kumasi

Appendix F: Consent Form

CONSENT FORM

HEALTH-RELATED QUALITY OF LIFE OF PEOPLE WITH CHRONIC HEPATITIS B IN THE KUMASI METROPOLIS

PARTICIPANTS' STATEMENT

I acknowledge that I have read or have had the purpose and contents of the Participants' Information Sheet read and satisfactorily explained to me in a language I understand (Twi [ ] English [ ]). I fully understand the contents and any potential implications as well as my right to change my mind (i.e. withdraw from the research) even after I have signed this form.
I voluntarily agree to be part of this research.

Initials of Participant…… ID Code

Participants' Signature .OR Thumb Print

Date:

INTERPRETERS' STATEMENT

I interpreted the purpose and contents of the Participants' Information Sheet to the afore named participant to the best of my ability in the (Twi [ ] English [ ]) language to his proper understanding.

All questions and appropriate clarifications sort by the participant and answers were also duly interpreted to his/her satisfaction.

Name of Interpreter

Signature of Interpreter.. Date

Contact Details of interpreter….

STATEMENT OF WITNESS

I was present when the purpose and contents of the Participant Information Sheet was read and explained satisfactorily to the participant in the language he/she understood (Twi [ ] English [ ])

I confirm that he/she was given the opportunity to ask questions/seek clarifications and same were duly answered to his/her satisfaction before voluntarily agreeing to be part of the research.

Name: ….

Signature OR Thumb Print

INVESTIGATOR STATEMENT AND SIGNATURE

I certify that the participant has been given ample time to read and learn about the study. All questions and clarifications raised by the participant have been addressed.

Researcher's name

Signature

Date

Appendix G: Research Questionnaire

Research Questionnaire

UNIVERSITY OF GHANA

School of Nursing and Midwifery

Community Health Department

Dear Sir/ Madam

This is an academic research questionnaire assessing the **Health-related quality of life of people with chronic hepatitis B in the Kumasi metropolis.** Please make time to answer all the questions honestly.

Thank you.

Section A

Demographic and socioeconomic characteristics

Tick where appropriate

1. How old are you?
   [ ] 30 years and below
   [ ] 31 to 40 years
   [ ] 41 to 50 years
   [ ] Above 50 years

2. Sex
   [ ] Male
   [ ] Female

3. Marital status
   [ ] Married
   [ ] Single
   [ ] Divorced
   [ ] Widowed

4. What is your employment status?
   [ ] Full time employment
   [ ] Unemployed
   [ ] Part time employment
   [ ] Retirement

5. What is your monthly income approximately?
   [ ] GH¢ 350 and below
   [ ] Above GH¢ 350 to GH¢ 700
   [ ]Above GH¢ 700 to GH¢ 1050
   [ ]Above GH¢ 1050

6. What is your highest formal educational level?
   [ ] Basic education
   [ ] Secondary education
   [ ] Tertiary education
   [ ] No formal education

7. Are you on antiviral therapy for hepatitis B?
   [ ] Yes
   [ ] No

Section B

Tick the box beside the reply that is closest to how you have been feeling in the past week. Don't take too long over you replies: your immediate is best.

D	A	
		I feel tense or 'wound up':
	3	Most of the time
	2	A lot of the time
	1	From time to time, occasionally
	0	Not at all
		I feel as if I am slowed down:
3		Nearly all the time
2		Very often
1		Sometimes
0		Not at all

		I still enjoy the things I used to enjoy:
0		Definitely as much
1		Not quite so much
2		Only a little
3		Hardly at all
		I get a sort of frightened feeling like 'butterflies' in the stomach:
	0	Not at all
	1	Occasionally
	2	Quite Often
	3	Very Often
		I get a sort of frightened feeling as if something awful is about to happen:
	3	Very definitely and quite badly
	2	Yes, but not too badly
	1	A little, but it doesn't worry me
	0	Not at all
		I have lost interest in my appearance
3		Definitely
2		I don't take as much care as I should
1		I may not take quite as much care
0		I take just as much care as ever
		I can laugh and see the funny side of things:
0		As much as I always could
1		Not quite so much now
2		Definitely not so much now
3		Not at all
		I feel restless as I have to be on the move:
	3	Very much indeed
	2	Quite a lot
	1	Not very much
	0	Not at all

		Worrying thoughts go through my mind:
	3	A great deal of the time
	2	A lot of the time
	1	From time to time, but not too often
	0	Only occasionally
		I look forward with enjoyment to things:
0		As much as I ever did
1		Rather less than I used to
2		Definitely less than I used to
3		Hardly at all
D	**A**	
		I feel cheerful:
3		Not at all
2		Not often
1		Sometimes
0		Most of the time
		I get sudden feelings of panic:
	3	Very often indeed
	2	Quite often
	1	Not very often
	0	Not at all
		I can sit at ease and feel relaxed:
	0	Definitely
	1	Usually
	2	Not Often
	3	Not at all
		I can enjoy a good book or radio or TV program:
0		Often
1		Sometimes
2		Not often
3		Very seldom

Section C

Functional well-being

Below is a list of statements that other people with your illness have said are important. Please circle or mark one number per line to indicate your response as it applies to the past 7 days.

	Not at all	A little bit	Somewhat	Quite a bit	Very much
GF1. I am able to work (include work at home)	0	1	2	3	4
GF2. My work (include work at home) is fulfilling	0	1	2	3	4
GF3. I am able to enjoy life	0	1	2	3	4
GF4. I have accepted my illness	0	1	2	3	4
GF5. I am sleeping well	0	1	2	3	4
GF6. I am enjoying the things I usually do for fun	0	1	2	3	4
GF7. I am content with the quality of my life right now	0	1	2	3	4

Section D

In general, would you say your health is:

1.Excellent ---- [ ] 2.Very good ---- [ ] 3.Good ----- [ ] 4.Fair ------ [ ] 5.Poor ---- [ ]

Section E

Some people with hepatitis B say that having hepatitis B affects the way they feel socially and mentally.
Below is a list of statements about how hepatitis B might make you feel socially or mentally. Please read each one carefully and circle the number that best describes how frequently, if ever, you feel that way. Circle only one number for each statement and do not skip any items.

	Never	Rarely	Sometimes	A Lot of the Time	All of the Time
F1. I feel ashamed because of hepatitis B	1	2	3	4	5
F2. I feel stigmatized because of hepatitis B	1	2	3	4	5
F3.I feel sad because of hepatitis B	1	2	3	4	5
F4. I feel frustrated because of hepatitis B	1	2	3	4	5
F5. I feel worn out and tired because of hepatitis B	1	2	3	4	5
F6. I feel anxious because of hepatitis B	1	2	3	4	5
F7. I feel angry because of hepatitis B	1	2	3	4	5
F8. I feel isolated from others because of hepatitis B	1	2	3	4	5
F9. I feel like something bad might happen because of hepatitis B	1	2	3	4	5
F10. I feel my life is less enjoyable because of hepatitis B	1	2	3	4	5
F11. I feel like sexual activity is difficult for me because of hepatitis B	1	2	3	4	5
F12. I feel like I am less productive because of hepatitis B	1	2	3	4	5
F13. I feel scared because of hepatitis B	1	2	3	4	5

Some people have concerns about their hepatitis B. Below there is a list of possible concerns that some people have expressed about hepatitis B. For each one, please think about whether you also have that concern and, if so, how much of a concern it is to you. Circle the number that best describes your level of concern for each statement. Circle only one number for each statement and do not skip any items.

How concerned are you that	Not at All Concerned	A Little Bit Concerned	Moderately Concerned	Quite a Bit Concerned	Extremely Concerned
C1. One day you could develop liver failure because of your hepatitis B	1	2	3	4	5
C2. You might develop liver cancer because of your hepatitis B	1	2	3	4	5
C3. Someone influential, like your boss, might find out about your hepatitis B	1	2	3	4	5
C4. You could transmit hepatitis B to a Child	1	2	3	4	5
C5. Your hepatitis B may flare up at any Time	1	2	3	4	5
C6. It is easier to get other illnesses because of having hepatitis B	1	2	3	4	5
C7. You could transmit hepatitis B to a partner through sex	1	2	3	4	5
C8. You have to watch what medicines you take because you have hepatitis	1	2	3	4	5
C9. Hepatitis B might affect your life Expectancy	1	2	3	4	5
C10. You are overly self-conscious because of hepatitis B	1	2	3	4	5

Some people have concerns about their hepatitis B. Below there is a list of possible concerns that some people have expressed about hepatitis B. For each one, please think about whether you also have that concern and, if so, how much of a concern it is to you. Circle the number that best describes your level of concern for each statement. Circle only one number for each statement and do not skip any items.

How concerned are you that	Not at All Concerned	A Little Bit Concerned	Moderately Concerned	Quite a Bit Concerned	Extremely Concerned
C11. You could be socially isolated because of hepatitis B	1	2	3	4	5
C12. Something serious might be wrong because of your hepatitis B	1	2	3	4	5
How concerned are you that	**Not at All Concerned**	**A Little Bit Concerned**	**Moderately Concerned**	**Quite a Bit Concerned**	**Extremely Concerned**
C13. You have to watch what you eat because you have hepatitis B	1	2	3	4	5
C14. You might be embarrassed because of your hepatitis B	1	2	3	4	5
C15. Your health might unexpectedly get worse because of hepatitis B	1	2	3	4	5

Some people with hepatitis B say that having hepatitis B affects the way they feel Physically. Below is a list of physical symptoms. Please read each one carefully and circle the number that best describes how frequently, if ever, you think that hepatitis B (as opposed to other conditions) causes that symptom.

How frequently do you feel	Never	Rarely	Sometimes	A Lot of the Time	All of the Time
P1. Tiredness	1	2	3	4	5
P2. Memory problems	1	2	3	4	5
P3. Muscle aches	1	2	3	4	5

** End of questionnaire **

Thank you for your time and effort in answering these questions. Please check over your responses to make sure you did not skip any questions.

Appendix H: Analysis

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
HRQoL	99.7111	25.56588	180
Below GH¢ 350	.37	.485	180
Btw GH¢ 350 & GH¢ 700	.27	.446	180
Btw GH¢ 700 & GH¢ 1050	.09	.293	180
Above GH¢ 1050	.26	.440	180
Full	.64	.482	180
Unemp	.20	.401	180
Part	.07	.260	180
Retire	.08	.277	180
Basic	.25	.434	180
Secon	.24	.431	180
Tert	.41	.492	180
No_Form	.10	.301	180
Funct	20.5556	5.50898	180

		Qol	Below GH¢ 350	Btw GH¢ 350 & GH¢ 700	Btw GH¢ 700 & GH¢ 1050	Above GH¢ 1050	Full
Pearson Correlation	HRQoL	1.000	-.266	-.022	.036	.292	.123
	Below GH¢ 350	-.266	1.000	-.471	-.249	-.458	-.522
	Btw GH¢ 350 & GH¢ 700	-.022	-.471	1.000	-.198	-.364	.044
	Btw GH¢ 700 & GH¢ 1050	.036	-.249	-.198	1.000	-.192	.203
	Above GH¢ 1050	.292	-.458	-.364	-.192	1.000	.394
	Full	.123	-.522	.044	.203	.394	1.000
	Unemp	-.089	.649	-.306	-.161	-.297	-.665
	Part	-.071	-.082	.215	-.017	-.117	-.371
	Retire	-.025	.017	.177	-.097	-.133	-.401
	Basic	.043	.086	.079	.033	-.197	-.047
	Secon	-.094	.124	.175	-.051	-.279	-.057
	Tert	.196	-.285	-.124	.043	.411	.173
	No_Form	-.248	.165	-.162	-.044	.013	-.135
	Funct	.549	-.266	.074	.085	.161	.150

Sig. (1-tailed)	HRQoL	.	.000	.385	.317	.000	.051
	Below GH¢ 350	.000	.	.000	.000	.000	.000
	Btw GH¢ 350 & GH¢ 700	.385	.000	.	.004	.000	.279
	Btw GH¢ 700 & GH¢ 1050	.317	.000	.004	.	.005	.003
	Above GH¢ 1050	.000	.000	.000	.005	.	.000
	Full	.051	.000	.279	.003	.000	.
	Unemp	.119	.000	.000	.015	.000	.000
	Part	.172	.138	.002	.412	.059	.000
	Retire	.370	.409	.009	.097	.037	.000
	Basic	.284	.125	.145	.331	.004	.267
	Secon	.105	.049	.009	.248	.000	.224
	Tert	.004	.000	.049	.284	.000	.010
	No_Form	.000	.014	.015	.277	.433	.035
	Funct	.000	.000	.160	.129	.015	.022
N	HRQoL	180	180	180	180	180	180
	Below GH¢ 350	180	180	180	180	180	180
	Btw GH¢ 350 & GH¢ 700	180	180	180	180	180	180
	Btw GH¢ 700 & GH¢ 1050	180	180	180	180	180	180
	Above GH¢ 1050	180	180	180	180	180	180
	Full	180	180	180	180	180	180
	Unemp	180	180	180	180	180	180
	Part	180	180	180	180	180	180
	Retire	180	180	180	180	180	180
	Basic	180	180	180	180	180	180
	Secon	180	180	180	180	180	180
	Tert	180	180	180	180	180	180
	No_Form	180	180	180	180	180	180
	Funct	180	180	180	180	180	180

		Unemp	Part	Retire	Basic	Secon	Tert	No_Form
Pearson Correlation	HRQoL	-.089	-.071	-.025	.043	-.094	.196	-.248
	Below GH¢ 350	.649	-.082	.017	.086	.124	-.285	.165
	Btw GH¢ 350 & GH¢ 700	-.306	.215	.177	.079	.175	-.124	-.162
	Btw GH¢ 700 & GH¢ 1050	-.161	-.017	-.097	.033	-.051	.043	-.044
	Above GH¢ 1050	-.297	-.117	-.133	-.197	-.279	.411	.013
	Full	-.665	-.371	-.401	-.047	-.057	.173	-.135
	Unemp	1.000	-.140	-.151	.064	.071	-.130	.019
	Part	-.140	1.000	-.084	.186	-.109	-.012	-.093
	Retire	-.151	-.084	1.000	-.174	.109	-.085	.235
	Basic	.064	.186	-.174	1.000	-.328	-.477	-.192
	Secon	.071	-.109	.109	-.328	1.000	-.470	-.190
	Tert	-.130	-.012	-.085	-.477	-.470	1.000	-.275
	No_Form	.019	-.093	.235	-.192	-.190	-.275	1.000
	Funct	.030	-.044	-.246	.000	-.182	.388	-.374
Sig. (1-tailed)	HRQoL	.119	.172	.370	.284	.105	.004	.000
	Below GH¢ 350	.000	.138	.409	.125	.049	.000	.014
	Btw GH¢ 350 & GH¢ 700	.000	.002	.009	.145	.009	.049	.015
	Btw GH¢ 700 & GH¢ 1050	.015	.412	.097	.331	.248	.284	.277
	Above GH¢ 1050	.000	.059	.037	.004	.000	.000	.433
	Full	.000	.000	.000	.267	.224	.010	.035
	Unemp	.	.031	.022	.196	.171	.041	.403
	Part	.031	.	.131	.006	.073	.437	.107
	Retire	.022	.131	.	.010	.072	.127	.001
	Basic	.196	.006	.010	.	.000	.000	.005
	Secon	.171	.073	.072	.000	.	.000	.005
	Tert	.041	.437	.127	.000	.000	.	.000
	No_Form	.403	.107	.001	.005	.005	.000	.
	Funct	.343	.279	.000	.500	.007	.000	.000
N	HRQoL	180	180	180	180	180	180	180
	Below GH¢ 350	180	180	180	180	180	180	180
	Btw GH¢ 350 & GH¢ 700	180	180	180	180	180	180	180
	Btw GH¢ 700 & GH¢ 1050	180	180	180	180	180	180	180
	Above GH¢ 1050	180	180	180	180	180	180	180
	Full	180	180	180	180	180	180	180
	Unemp	180	180	180	180	180	180	180
	Part	180	180	180	180	180	180	180
	Retire	180	180	180	180	180	180	180
	Basic	180	180	180	180	180	180	180
	Secon	180	180	180	180	180	180	180
	Tert	180	180	180	180	180	180	180
	No_Form	180	180	180	180	180	180	180
	Funct	180	180	180	180	180	180	180

Correlations

		Funct
Pearson Correlation	HRQoL	.549
	Below GH¢ 350	-.266
	Btw GH¢ 350 & GH¢ 700	.074
	Btw GH¢ 700 & GH¢ 1050	.085
	Above GH¢ 1050	.161
	Full	.150
	Unemp	.030
	Part	-.044
	Retire	-.246
	Basic	.000
	Secon	-.182
	Tert	.388
	No_Form	-.374
	Funct	1.000
Sig. (1-tailed)	HRQoL	.000
	Below GH¢ 350	.000
	Btw GH¢ 350 & GH¢ 700	.160
	Btw GH¢ 700 & GH¢ 1050	.129
	Above GH¢ 1050	.015
	Full	.022
	Unemp	.343
	Part	.279
	Retire	.000
	Basic	.500
	Secon	.007
	Tert	.000
	No_Form	.000
	Funct	.
N	HRQoL	180
	Below GH¢ 350	180
	Btw GH¢ 350 & GH¢ 700	180
	Btw GH¢ 700 & GH¢ 1050	180
	Above GH¢ 1050	180
	Full	180
	Unemp	180
	Part	180
	Retire	180
	Basic	180
	Secon	180
	Tert	180
	No_Form	180
	Funct	180

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	.450[a]	.203	.156	23.49022	.203	4.303	10
2	.635[b]	.403	.364	20.39207	.200	56.253	1

Model Summary[c]

Model	Change Statistics		
	df2	Sig. F Change	
1	169	.000	
2	168	.000	1.683

a. Predictors: (Constant), No_Form, Above GH¢ 1050, Part, Btw GH¢ 700 & GH¢ 1050, Retire, Basic, Unemp, Secon, Btw GH¢ 350 & GH¢ 700, Full

b. Predictors: (Constant), No_Form, Above GH¢ 1050, Part, Btw GH¢ 700 & GH¢ 1050, Retire, Basic, Unemp, Secon, Btw GH¢ 350 & GH¢ 700, Full, Funct

c. Dependent Variable: HRQoL

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23744.391	10	2374.439	4.303	.000[b]
	Residual	93252.586	169	551.790		
	Total	116996.978	179			
2	Regression	47136.453	11	4285.132	10.305	.000[c]
	Residual	69860.525	168	415.836		
	Total	116996.978	179			

a. Dependent Variable: HRQoL

b. Predictors: (Constant), No_Form, Above GH¢ 1050, Part, Btw GH¢ 700 & GH¢ 1050, Retire, Basic, Unemp, Secon, Btw GH¢ 350 & GH¢ 700, Full

c. Predictors: (Constant), No_Form, Above GH¢ 1050, Part, Btw GH¢ 700 & GH¢ 1050, Retire, Basic, Unemp, Secon, Btw GH¢ 350 & GH¢ 700, Full, Funct

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	131.538	24.431		5.384	.000
	Btw GH¢ 350 & GH¢ 700	10.276	5.574	.179	1.843	.067
	Btw GH¢ 700 & GH¢ 1050	15.716	7.383	.180	2.129	.035
	Above GH¢ 1050	26.536	6.143	.457	4.320	.000
	Full	-43.834	24.557	-.826	-1.785	.076
	Unemp	-34.318	24.480	-.538	-1.402	.163
	Part	-50.070	25.382	-.508	-1.973	.050
	Retire	-32.346	24.752	-.351	-1.307	.193
	Basic	4.419	4.822	.075	.917	.361
	Secon	-2.490	4.980	-.042	-.500	.618
	No_Form	-23.538	6.715	-.277	-3.505	.001
2	(Constant)	72.430	22.626		3.201	.002
	Btw GH¢ 350 & GH¢ 700	.112	5.025	.002	.022	.982
	Btw GH¢ 700 & GH¢ 1050	6.399	6.528	.073	.980	.328
	Above GH¢ 1050	18.699	5.434	.322	3.441	.001
	Full	-35.911	21.344	-.677	-1.682	.094
	Unemp	-34.928	21.252	-.548	-1.644	.102
	Part	-37.079	22.102	-.376	-1.678	.095
	Retire	-18.128	21.571	-.197	-.840	.402
	Basic	10.197	4.256	.173	2.396	.018
	Secon	7.458	4.522	.126	1.649	.101
	No_Form	-4.905	6.337	-.058	-.774	.440
	Funct	2.530	.337	.545	7.500	.000

Model		95.0% Confidence Interval for B		Correlations		
		Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	83.309	179.768			
	Btw GH¢ 350 & GH¢ 700	-.728	21.280	-.022	.140	.127
	Btw GH¢ 700 & GH¢ 1050	1.141	30.291	.036	.162	.146
	Above GH¢ 1050	14.409	38.664	.292	.315	.297
	Full	-92.312	4.644	.123	-.136	-.123
	Unemp	-82.645	14.008	-.089	-.107	-.096
	Part	-100.177	.037	-.071	-.150	-.135
	Retire	-81.209	16.517	-.025	-.100	-.090
	Basic	-5.100	13.939	.043	.070	.063
	Secon	-12.321	7.341	-.094	-.038	-.034
	No_Form	-36.795	-10.282	-.248	-.260	-.241

2	(Constant)	27.763	117.098			
	Btw GH¢ 350 & GH¢ 700	-9.809	10.032	-.022	.002	.001
	Btw GH¢ 700 & GH¢ 1050	-6.489	19.288	.036	.075	.058
	Above GH¢ 1050	7.970	29.428	.292	.257	.205
	Full	-78.049	6.227	.123	-.129	-.100
	Unemp	-76.883	7.027	-.089	-.126	-.098
	Part	-80.713	6.555	-.071	-.128	-.100
	Retire	-60.713	24.456	-.025	-.065	-.050
	Basic	1.794	18.600	.043	.182	.143
	Secon	-1.469	16.385	-.094	.126	.098
	No_Form	-17.415	7.604	-.248	-.060	-.046
	Funct	1.864	3.196	.549	.501	.447

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Btw GH¢ 350 & GH¢ 700	.498	2.008
	Btw GH¢ 700 & GH¢ 1050	.658	1.521
	Above GH¢ 1050	.421	2.375
	Full	.022	45.386
	Unemp	.032	31.279
	Part	.071	14.082
	Retire	.066	15.267
	Basic	.703	1.422
	Secon	.669	1.494
	No_Form	.755	1.324
2	(Constant)		
	Btw GH¢ 350 & GH¢ 700	.462	2.166
	Btw GH¢ 700 & GH¢ 1050	.634	1.578
	Above GH¢ 1050	.405	2.466
	Full	.022	45.497
	Unemp	.032	31.279
	Part	.071	14.169
	Retire	.065	15.385
	Basic	.680	1.470
	Secon	.612	1.635
	No_Form	.639	1.564
	Funct	.673	1.486

a. Dependent Variable: HRQoL

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics	
						Tolerance	VIF
1	Below GH¢ 350	.[b]	.	.	.	.000	.
	Tert	.[b]	.	.	.	.000	.
	Funct	.545[b]	7.500	.000	.501	.673	1.486
2	Below GH¢ 350	.[c]	.	.	.	.000	.
	Tert	.[c]	.	.	.	.000	.

Excluded Variables[a]

Model		Collinearity Statistics
		Minimum Tolerance
1	Below GH¢ 350	.000
	Tert	.000
	Funct	.022
2	Below GH¢ 350	.000
	Tert	.000

a. Dependent Variable: HRQoL

b. Predictors in the Model: (Constant), No_Form, Above GH¢ 1050, Part, Btw GH¢ 700 & GH¢ 1050, Retire, Basic, Unemp, Secon, Btw GH¢ 350 & GH¢ 700, Full

c. Predictors in the Model: (Constant), No_Form, Above GH¢ 1050, Part, Btw GH¢ 700 & GH¢ 1050, Retire, Basic, Unemp, Secon, Btw GH¢ 350 & GH¢ 700, Full, Funct

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	Btw GH¢ 350 & GH¢ 700	Btw GH¢ 700 & GH¢ 1050
1	1	3.344	1.000	.00	.01	.01
	2	1.380	1.557	.00	.04	.02
	3	1.353	1.572	.00	.01	.01
	4	1.166	1.693	.00	.04	.00
	5	1.074	1.764	.00	.00	.03
	6	.980	1.847	.00	.00	.42
	7	.711	2.168	.00	.03	.01
	8	.574	2.413	.00	.09	.02
	9	.312	3.275	.00	.25	.07
	10	.102	5.729	.01	.52	.41
	11	.003	35.817	.99	.00	.00
2	1	4.254	1.000	.00	.01	.00
	2	1.385	1.753	.00	.04	.02
	3	1.353	1.773	.00	.01	.01
	4	1.175	1.903	.00	.04	.00
	5	1.075	1.989	.00	.00	.03
	6	.983	2.080	.00	.00	.41
	7	.712	2.445	.00	.02	.01
	8	.579	2.712	.00	.08	.02
	9	.339	3.544	.00	.18	.03
	10	.113	6.133	.00	.59	.45
	11	.030	11.916	.02	.02	.01
	12	.002	41.361	.98	.00	.00

Model	Dimension	Variance Proportions					
		Above GH¢ 1050	Full	Unemp	Part	Retire	Basic
1	1	.01	.00	.00	.00	.00	.01
	2	.06	.00	.00	.00	.01	.00
	3	.01	.00	.00	.01	.01	.08
	4	.00	.00	.01	.00	.00	.02
	5	.01	.00	.00	.01	.00	.03
	6	.05	.00	.00	.00	.00	.00
	7	.01	.00	.00	.04	.00	.22
	8	.07	.00	.00	.00	.04	.01
	9	.01	.00	.01	.00	.00	.42
	10	.77	.02	.00	.01	.01	.21
	11	.00	.98	.97	.92	.93	.00

2	1	.00	.00	.00	.00	.00	.01
	2	.06	.00	.00	.00	.01	.00
	3	.01	.00	.00	.01	.01	.07
	4	.01	.00	.01	.00	.00	.02
	5	.01	.00	.00	.01	.00	.04
	6	.04	.00	.00	.00	.00	.00
	7	.01	.00	.00	.04	.00	.22
	8	.05	.00	.00	.00	.04	.00
	9	.00	.00	.01	.00	.00	.42
	10	.80	.01	.01	.01	.00	.12
	11	.00	.04	.05	.02	.02	.09
	12	.00	.95	.92	.90	.91	.00

Collinearity Diagnostics[a]

Model	Dimension	Variance Proportions		
		Secon	No_Form	Funct
1	1	.01	.01	
	2	.04	.00	
	3	.01	.13	
	4	.00	.01	
	5	.16	.16	
	6	.01	.05	
	7	.07	.02	
	8	.00	.35	
	9	.47	.09	
	10	.23	.13	
	11	.00	.06	
2	1	.01	.00	.00
	2	.04	.00	.00
	3	.01	.11	.00
	4	.00	.01	.00
	5	.14	.14	.00
	6	.00	.04	.00
	7	.06	.01	.00
	8	.00	.31	.00
	9	.44	.06	.01
	10	.11	.05	.04
	11	.17	.18	.90
	12	.01	.09	.05

a. Dependent Variable: HRQoL

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	52.8344	133.5075	99.7111	16.22751	180
Residual	-47.24504	62.37407	.00000	19.75556	180
Std. Predicted Value	-2.889	2.083	.000	1.000	180
Std. Residual	-2.317	3.059	.000	.969	180

a. Dependent Variable: HRQoL

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
HRQoL	99.7111	25.56588	180
Below GH¢ 350	.37	.485	180
Btw GH¢ 350 & GH¢ 700	.27	.446	180
Btw GH¢ 700 & GH¢ 1050	.09	.293	180
Above GH¢ 1050	.26	.440	180
Full	.64	.482	180
Unemp	.20	.401	180
Part	.07	.260	180
Retire	.08	.277	180
Basic	.25	.434	180
Secon	.24	.431	180
Tert	.41	.492	180
No_Form	.10	.301	180
ghp	3.41	.775	180

		Qol	Below GH¢ 350	Btw GH¢ 350 & GH¢ 700	Btw GH¢ 700 & GH¢ 1050	Above GH¢ 1050	Full
Pearson Correlation	HRQoL	1.000	-.266	-.022	.036	.292	.123
	Below GH¢ 350	-.266	1.000	-.471	-.249	-.458	-.522
	Btw GH¢ 350 & GH¢ 700	-.022	-.471	1.000	-.198	-.364	.044
	Btw GH¢ 700 & GH¢ 1050	.036	-.249	-.198	1.000	-.192	.203
	Above GH¢ 1050	.292	-.458	-.364	-.192	1.000	.394
	Full	.123	-.522	.044	.203	.394	1.000
	Unemp	-.089	.649	-.306	-.161	-.297	-.665
	Part	-.071	-.082	.215	-.017	-.117	-.371
	Retire	-.025	.017	.177	-.097	-.133	-.401
	Basic	.043	.086	.079	.033	-.197	-.047
	Secon	-.094	.124	.175	-.051	-.279	-.057
	Tert	.196	-.285	-.124	.043	.411	.173
	No_Form	-.248	.165	-.162	-.044	.013	-.135
	ghp	.488	-.151	.051	.027	.097	.095

Sig. (1-tailed)	HRQoL	.	.000	.385	.317	.000	.051
	Below GH¢ 350	.000	.	.000	.000	.000	.000
	Btw GH¢ 350 & GH¢ 700	.385	.000	.	.004	.000	.279
	Btw GH¢ 700 & GH¢ 1050	.317	.000	.004	.	.005	.003
	Above GH¢ 1050	.000	.000	.000	.005	.	.000
	Full	.051	.000	.279	.003	.000	.
	Unemp	.119	.000	.000	.015	.000	.000
	Part	.172	.138	.002	.412	.059	.000
	Retire	.370	.409	.009	.097	.037	.000
	Basic	.284	.125	.145	.331	.004	.267
	Secon	.105	.049	.009	.248	.000	.224
	Tert	.004	.000	.049	.284	.000	.010
	No_Form	.000	.014	.015	.277	.433	.035
	ghp	.000	.021	.250	.359	.097	.102
N	HRQoL	180	180	180	180	180	180
	Below GH¢ 350	180	180	180	180	180	180
	Btw GH¢ 350 & GH¢ 700	180	180	180	180	180	180
	Btw GH¢ 700 & GH¢ 1050	180	180	180	180	180	180
	Above GH¢ 1050	180	180	180	180	180	180
	Full	180	180	180	180	180	180
	Unemp	180	180	180	180	180	180
	Part	180	180	180	180	180	180
	Retire	180	180	180	180	180	180
	Basic	180	180	180	180	180	180
	Secon	180	180	180	180	180	180
	Tert	180	180	180	180	180	180
	No_Form	180	180	180	180	180	180
	ghp	180	180	180	180	180	180

		Unemp	Part	Retire	Basic	Secon	Tert	No_Form
Pearson Correlation	HRQoL	-.089	-.071	-.025	.043	-.094	.196	-.248
	Below GH¢ 350	.649	-.082	.017	.086	.124	-.285	.165
	Btw GH¢ 350 & GH¢ 700	-.306	.215	.177	.079	.175	-.124	-.162
	Btw GH¢ 700 & GH¢ 1050	-.161	-.017	-.097	.033	-.051	.043	-.044
	Above GH¢ 1050	-.297	-.117	-.133	-.197	-.279	.411	.013
	Full	-.665	-.371	-.401	-.047	-.057	.173	-.135
	Unemp	1.000	-.140	-.151	.064	.071	-.130	.019
	Part	-.140	1.000	-.084	.186	-.109	-.012	-.093
	Retire	-.151	-.084	1.000	-.174	.109	-.085	.235
	Basic	.064	.186	-.174	1.000	-.328	-.477	-.192
	Secon	.071	-.109	.109	-.328	1.000	-.470	-.190
	Tert	-.130	-.012	-.085	-.477	-.470	1.000	-.275
	No_Form	.019	-.093	.235	-.192	-.190	-.275	1.000
	ghp	.043	-.008	-.210	-.004	-.131	.343	-.367
Sig. (1-tailed)	HRQoL	.119	.172	.370	.284	.105	.004	.000
	Below GH¢ 350	.000	.138	.409	.125	.049	.000	.014
	Btw GH¢ 350 & GH¢ 700	.000	.002	.009	.145	.009	.049	.015
	Btw GH¢ 700 & GH¢ 1050	.015	.412	.097	.331	.248	.284	.277
	Above GH¢ 1050	.000	.059	.037	.004	.000	.000	.433
	Full	.000	.000	.000	.267	.224	.010	.035
	Unemp	.	.031	.022	.196	.171	.041	.403
	Part	.031	.	.131	.006	.073	.437	.107
	Retire	.022	.131	.	.010	.072	.127	.001
	Basic	.196	.006	.010	.	.000	.000	.005
	Secon	.171	.073	.072	.000	.	.000	.005
	Tert	.041	.437	.127	.000	.000	.	.000
	No_Form	.403	.107	.001	.005	.005	.000	.
	ghp	.283	.460	.002	.478	.039	.000	.000
N	HRQoL	180	180	180	180	180	180	180
	Below GH¢ 350	180	180	180	180	180	180	180
	Btw GH¢ 350 & GH¢ 700	180	180	180	180	180	180	180
	Btw GH¢ 700 & GH¢ 1050	180	180	180	180	180	180	180
	Above GH¢ 1050	180	180	180	180	180	180	180
	Full	180	180	180	180	180	180	180
	Unemp	180	180	180	180	180	180	180
	Part	180	180	180	180	180	180	180
	Retire	180	180	180	180	180	180	180
	Basic	180	180	180	180	180	180	180
	Secon	180	180	180	180	180	180	180
	Tert	180	180	180	180	180	180	180
	No_Form	180	180	180	180	180	180	180
	ghp	180	180	180	180	180	180	180

Correlations

		ghp
Pearson Correlation	HRQoL	.488
	Below GH¢ 350	-.151
	Btw GH¢ 350 & GH¢ 700	.051
	Btw GH¢ 700 & GH¢ 1050	.027
	Above GH¢ 1050	.097
	Full	.095
	Unemp	.043
	Part	-.008
	Retire	-.210
	Basic	-.004
	Secon	-.131
	Tert	.343
	No_Form	-.367
	ghp	1.000
Sig. (1-tailed)	HRQoL	.000
	Below GH¢ 350	.021
	Btw GH¢ 350 & GH¢ 700	.250
	Btw GH¢ 700 & GH¢ 1050	.359
	Above GH¢ 1050	.097
	Full	.102
	Unemp	.283
	Part	.460
	Retire	.002
	Basic	.478
	Secon	.039
	Tert	.000
	No_Form	.000
	ghp	.
N	HRQoL	180
	Below GH¢ 350	180
	Btw GH¢ 350 & GH¢ 700	180
	Btw GH¢ 700 & GH¢ 1050	180
	Above GH¢ 1050	180
	Full	180
	Unemp	180
	Part	180
	Retire	180
	Basic	180
	Secon	180
	Tert	180
	No_Form	180
	ghp	180

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	.450[a]	.203	.156	23.49022	.203	4.303	10
2	.601[b]	.361	.319	21.09786	.158	41.500	1

Model Summary[c]

Model	Change Statistics		
	df2	Sig. F Change	
1	169	.000	
2	168	.000	1.811

a. Predictors: (Constant), No_Form, Above GH¢ 1050, Part, Btw GH¢ 700 & GH¢ 1050, Retire, Basic, Unemp, Secon, Btw GH¢ 350 & GH¢ 700, Full
b. Predictors: (Constant), No_Form, Above GH¢ 1050, Part, Btw GH¢ 700 & GH¢ 1050, Retire, Basic, Unemp, Secon, Btw GH¢ 350 & GH¢ 700, Full, ghp
c. Dependent Variable: HRQoL

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23744.391	10	2374.439	4.303	.000[b]
	Residual	93252.586	169	551.790		
	Total	116996.978	179			
2	Regression	42216.845	11	3837.895	8.622	.000[c]
	Residual	74780.133	168	445.120		
	Total	116996.978	179			

a. Dependent Variable: HRQoL
b. Predictors: (Constant), No_Form, Above GH¢ 1050, Part, Btw GH¢ 700 & GH¢ 1050, Retire, Basic, Unemp, Secon, Btw GH¢ 350 & GH¢ 700, Full
c. Predictors: (Constant), No_Form, Above GH¢ 1050, Part, Btw GH¢ 700 & GH¢ 1050, Retire, Basic, Unemp, Secon, Btw GH¢ 350 & GH¢ 700, Full, ghp

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	131.538	24.431		5.384	.000
	Btw GH¢ 350 & GH¢ 700	10.276	5.574	.179	1.843	.067
	Btw GH¢ 700 & GH¢ 1050	15.716	7.383	.180	2.129	.035
	Above GH¢ 1050	26.536	6.143	.457	4.320	.000
	Full	-43.834	24.557	-.826	-1.785	.076
	Unemp	-34.318	24.480	-.538	-1.402	.163
	Part	-50.070	25.382	-.508	-1.973	.050
	Retire	-32.346	24.752	-.351	-1.307	.193
	Basic	4.419	4.822	.075	.917	.361
	Secon	-2.490	4.980	-.042	-.500	.618
	No_Form	-23.538	6.715	-.277	-3.505	.001
2	(Constant)	70.177	23.921		2.934	.004
	Btw GH¢ 350 & GH¢ 700	5.875	5.053	.103	1.163	.247
	Btw GH¢ 700 & GH¢ 1050	13.156	6.643	.151	1.980	.049
	Above GH¢ 1050	24.244	5.529	.418	4.385	.000
	Full	-35.989	22.090	-.678	-1.629	.105
	Unemp	-30.797	21.994	-.483	-1.400	.163
	Part	-39.815	22.853	-.404	-1.742	.083
	Retire	-19.991	22.314	-.217	-.896	.372
	Basic	9.542	4.403	.162	2.167	.032
	Secon	5.030	4.623	.085	1.088	.278
	No_Form	-7.250	6.540	-.085	-1.109	.269
	ghp	15.024	2.332	.455	6.442	.000

Model		95.0% Confidence Interval for B		Correlations		
		Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	83.309	179.768			
	Btw GH¢ 350 & GH¢ 700	-.728	21.280	-.022	.140	.127
	Btw GH¢ 700 & GH¢ 1050	1.141	30.291	.036	.162	.146
	Above GH¢ 1050	14.409	38.664	.292	.315	.297
	Full	-92.312	4.644	.123	-.136	-.123

	Unemp	-82.645	14.008	-.089	-.107	-.096
	Part	-100.177	.037	-.071	-.150	-.135
	Retire	-81.209	16.517	-.025	-.100	-.090
	Basic	-5.100	13.939	.043	.070	.063
	Secon	-12.321	7.341	-.094	-.038	-.034
	No_Form	-36.795	-10.282	-.248	-.260	-.241
2	(Constant)	22.952	117.402			
	Btw GH¢ 350 & GH¢ 700	-4.100	15.851	-.022	.089	.072
	Btw GH¢ 700 & GH¢ 1050	.042	26.271	.036	.151	.122
	Above GH¢ 1050	13.328	35.159	.292	.320	.270
	Full	-79.598	7.620	.123	-.125	-.100
	Unemp	-74.217	12.623	-.089	-.107	-.086
	Part	-84.930	5.301	-.071	-.133	-.107
	Retire	-64.043	24.060	-.025	-.069	-.055
	Basic	.849	18.235	.043	.165	.134
	Secon	-4.096	14.156	-.094	.084	.067
	No_Form	-20.160	5.661	-.248	-.085	-.068
	ghp	10.420	19.628	.488	.445	.397

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Btw GH¢ 350 & GH¢ 700	.498	2.008
	Btw GH¢ 700 & GH¢ 1050	.658	1.521
	Above GH¢ 1050	.421	2.375
	Full	.022	45.386
	Unemp	.032	31.279
	Part	.071	14.082
	Retire	.066	15.267
	Basic	.703	1.422
	Secon	.669	1.494
	No_Form	.755	1.324
2	(Constant)		
	Btw GH¢ 350 & GH¢ 700	.489	2.046
	Btw GH¢ 700 & GH¢ 1050	.655	1.526
	Above GH¢ 1050	.419	2.385
	Full	.022	45.524
	Unemp	.032	31.298
	Part	.071	14.151
	Retire	.065	15.380
	Basic	.680	1.470
	Secon	.627	1.596
	No_Form	.642	1.557
	ghp	.762	1.312

a. Dependent Variable: HRQoL

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics	
						Tolerance	VIF
1	Below GH¢ 350	.[b]	.	.	.	.000	.
	Tert	.[b]	.	.	.	.000	.
	ghp	.455[b]	6.442	.000	.445	.762	1.312
2	Below GH¢ 350	.[c]	.	.	.	.000	.
	Tert	.[c]	.	.	.	.000	.

Excluded Variables[a]

Model		Collinearity Statistics
		Minimum Tolerance
1	Below GH¢ 350	.000
	Tert	.000
	ghp	.022
2	Below GH¢ 350	.000
	Tert	.000

a. Dependent Variable: HRQoL

b. Predictors in the Model: (Constant), No_Form, Above GH¢ 1050, Part, Btw GH¢ 700 & GH¢ 1050, Retire, Basic, Unemp, Secon, Btw GH¢ 350 & GH¢ 700, Full

c. Predictors in the Model: (Constant), No_Form, Above GH¢ 1050, Part, Btw GH¢ 700 & GH¢ 1050, Retire, Basic, Unemp, Secon, Btw GH¢ 350 & GH¢ 700, Full, ghp

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	Btw GH¢ 350 & GH¢ 700	Btw GH¢ 700 & GH¢ 1050
1	1	3.344	1.000	.00	.01	.01
	2	1.380	1.557	.00	.04	.02
	3	1.353	1.572	.00	.01	.01
	4	1.166	1.693	.00	.04	.00
	5	1.074	1.764	.00	.00	.03
	6	.980	1.847	.00	.00	.42
	7	.711	2.168	.00	.03	.01
	8	.574	2.413	.00	.09	.02
	9	.312	3.275	.00	.25	.07
	10	.102	5.729	.01	.52	.41
	11	.003	35.817	.99	.00	.00
2	1	4.264	1.000	.00	.01	.00
	2	1.383	1.756	.00	.04	.02
	3	1.353	1.775	.00	.01	.01
	4	1.176	1.904	.00	.04	.00
	5	1.075	1.992	.00	.00	.03
	6	.983	2.083	.00	.00	.42
	7	.712	2.447	.00	.03	.02
	8	.578	2.716	.00	.08	.02
	9	.330	3.594	.00	.20	.04
	10	.119	5.993	.00	.59	.43
	11	.025	13.123	.02	.00	.00
	12	.002	41.788	.97	.00	.00

Model	Dimension	Variance Proportions					
		Above GH¢ 1050	Full	Unemp	Part	Retire	Basic
1	1	.01	.00	.00	.00	.00	.01
	2	.06	.00	.00	.00	.01	.00
	3	.01	.00	.00	.01	.01	.08
	4	.00	.00	.01	.00	.00	.02
	5	.01	.00	.00	.01	.00	.03
	6	.05	.00	.00	.00	.00	.00
	7	.01	.00	.00	.04	.00	.22
	8	.07	.00	.00	.00	.04	.01
	9	.01	.00	.01	.00	.00	.42
	10	.77	.02	.00	.01	.01	.21
	11	.00	.98	.97	.92	.93	.00

2	1	.00	.00	.00	.00	.00	.01
	2	.06	.00	.00	.00	.01	.00
	3	.01	.00	.00	.01	.01	.07
	4	.01	.00	.01	.00	.00	.02
	5	.01	.00	.00	.01	.00	.03
	6	.05	.00	.00	.00	.00	.00
	7	.01	.00	.00	.04	.00	.22
	8	.06	.00	.00	.00	.04	.01
	9	.00	.00	.01	.00	.00	.43
	10	.78	.01	.01	.00	.00	.12
	11	.01	.05	.06	.04	.04	.09
	12	.00	.94	.92	.89	.90	.00

Collinearity Diagnostics[a]

		Variance Proportions		
Model	Dimension	Secon	No_Form	ghp
1	1	.01	.01	
	2	.04	.00	
	3	.01	.13	
	4	.00	.01	
	5	.16	.16	
	6	.01	.05	
	7	.07	.02	
	8	.00	.35	
	9	.47	.09	
	10	.23	.13	
	11	.00	.06	
2	1	.01	.00	.00
	2	.04	.00	.00
	3	.01	.11	.00
	4	.00	.01	.00
	5	.15	.14	.00
	6	.00	.04	.00
	7	.06	.01	.00
	8	.00	.31	.00
	9	.47	.07	.01
	10	.12	.05	.04
	11	.13	.16	.88
	12	.01	.10	.07

a. Dependent Variable: HRQoL

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	62.1791	133.5527	99.7111	15.35735	180
Residual	-40.16314	54.32249	.00000	20.43933	180
Std. Predicted Value	-2.444	2.204	.000	1.000	180
Std. Residual	-1.904	2.575	.000	.969	180

a. Dependent Variable: HRQoL
Run MATRIX procedure:

***************** PROCESS Procedure for SPSS Version 3.5 *****************

Written by Andrew F. Hayes, Ph.D. www.afhayes.com
Documentation available in Hayes (2018). www.guilford.com/p/hayes3

****
**
Model : 6
Y : HRQoL
X : HADSD
M1 : Funct
M2 : ghp

Sample
Size: 180

****
**
OUTCOME VARIABLE:
Funct

Model Summary

R	R-sq	MSE	F	df1	df2	p
.649531	.421891	17.643513	129.900385	1.000000	178.000000	.000000

Model

	coeff	se	t	p	LLCI	ULCI
constant	25.633579	.544544	47.073495	.000000	24.558986	26.708171
HADSD	-.977587	.085773	-11.397385	.000000	-1.146850	-.808325

Standardized coefficients

	coeff
HADSD	-.649531

Covariance matrix of regression parameter estimates:

	constant	HADSD
constant	.296528	-.038216
HADSD	-.038216	.007357

****
**
OUTCOME VARIABLE:
ghp

Model Summary

R	R-sq	MSE	F	df1	df2	p
.683440	.467090	.323342	77.569390	2.000000	177.000000	.000000

Model

	coeff	se	t	p	LLCI	ULCI
constant	1.945777	.270343	7.197430	.000000	1.412266	2.479288
HADSD	-.034341	.015272	-2.248668	.025767	-.064479	-.004203
Funct	.079694	.010147	7.854135	.000000	.059670	.099719

Standardized coefficients

	coeff
HADSD	-.162278
Funct	.566805

Covariance matrix of regression parameter estimates:

	constant	HADSD	Funct
constant	.073086	-.003280	-.002639
HADSD	-.003280	.000233	.000101
Funct	-.002639	.000101	.000103

****
**
OUTCOME VARIABLE:
HRQoL

Model Summary

R	R-sq	MSE	F	df1	df2	p
.579888	.336271	441.217839	29.722762	3.000000	176.000000	.000000

Model

	coeff	se	t	p	LLCI	ULCI
constant	50.457643	11.354167	4.443976	.000016	28.049790	72.865496
HADSD	-.890435	.572132	-1.556347	.121422	-2.019557	.238687
Funct	1.555782	.435263	3.574346	.000453	.696774	2.414790
ghp	6.430324	2.776571	2.315923	.021715	.950662	11.909986

Standardized coefficients

	coeff
HADSD	-.127484
Funct	.335242
ghp	.194821

Covariance matrix of regression parameter estimates:

	constant	HADSD	Funct	ghp
constant	128.917112	-4.991372	-2.405816	-15.000670
HADSD	-4.991372	.327335	.116243	.264745
Funct	-2.405816	.116243	.189454	-.614391
ghp	-15.000670	.264745	-.614391	7.709347

********** TOTAL EFFECT MODEL
****

OUTCOME VARIABLE:
HRQoL

Model Summary

R	R-sq	MSE	F	df1	df2	p
.448575	.201220	525.027420	44.839748	1.000000	178.000000	.000000

Model

	coeff	se	t	p	LLCI	ULCI
constant	115.986054	2.970512	39.045818	.000000	110.124100	121.848009
HADSD	-3.133144	.467895	-6.696249	.000000	-4.056481	-2.209808

Standardized coefficients

	coeff
HADSD	-.448575

Covariance matrix of regression parameter estimates:

	constant	HADSD
constant	8.823939	-1.137200
HADSD	-1.137200	.218926

********** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **********

Total effect of X on Y

Effect	se	t	p	LLCI	ULCI	c_ps	c_cs
-3.133144	.467895	-6.696249	.000000	-4.056481	-2.209808	-.122552	-.448575

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI	c'_ps	c'_cs
-.890435	.572132	-1.556347	.121422	-2.019557	.238687	-.034829	-.127484

Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
TOTAL	-2.242709	.431904	-3.116419	-1.427588
Ind1	-1.520913	.439735	-2.433119	-.715085
Ind2	-.220822	.153920	-.575877	.021596
Ind3	-.500974	.284611	-1.091144	.017500
(C1)	-1.300091	.517914	-2.356821	-.342804
(C2)	-1.019938	.615391	-2.264234	.169402
(C3)	.280152	.246378	-.049222	.879164

Partially standardized indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
TOTAL	-.087723	.015550	-.119145	-.058284
Ind1	-.059490	.016449	-.093220	-.029143
Ind2	-.008637	.006113	-.022901	.000858
Ind3	-.019595	.011051	-.042267	.000669

(C1)	-.050853	.019718	-.090724	-.013774
(C2)	-.039895	.023856	-.087942	.006770
(C3)	.010958	.009512	-.002017	.033849

Completely standardized indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
TOTAL	-.321091	.059585	-.440830	-.210578
Ind1	-.217750	.061607	-.345734	-.105819
Ind2	-.031615	.022317	-.082740	.003172
Ind3	-.071725	.040530	-.155912	.002581
(C1)	-.186135	.073045	-.336834	-.050004
(C2)	-.146026	.087827	-.323435	.025273
(C3)	.040110	.034769	-.007344	.124644

Specific indirect effect contrast definition(s):

(C1)	Ind1	minus	Ind2
(C2)	Ind1	minus	Ind3
(C3)	Ind2	minus	Ind3

Indirect effect key:

Ind1	HADSD	->	Funct	->	HRQoL	
Ind2	HADSD	->	ghp	->	HRQoL	
Ind3	HADSD	->	Funct	->	ghp	-> HRQoL

********** ANALYSIS NOTES AND ERRORS **********

Level of confidence for all confidence intervals in output:
 95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
 5000

------ END MATRIX -----

Matrix

Run MATRIX procedure:

********** PROCESS Procedure for SPSS Version 3.5 **********

Written by Andrew F. Hayes, Ph.D. www.afhayes.com
Documentation available in Hayes (2018). www.guilford.com/p/hayes3

****
**
Model : 6
Y : HRQoL
X : HADSA

```
  M1  : Funct
  M2  : ghp
Sample
Size:  180

*************************************************************************
**
OUTCOME VARIABLE:
 Funct

Model Summary
        R          R-sq       MSE          F          df1          df2          p
     .604473     .365387   19.367968   102.486030    1.000000   178.000000     .000000

Model
                coeff         se          t          p        LLCI       ULCI
constant    25.403712     .580469   43.764103     .000000   24.258224   26.549199
HADSA        -.825608     .081553  -10.123538     .000000    -.986544    -.664673

Standardized coefficients
          coeff
HADSA     -.604473

Covariance matrix of regression parameter estimates:
          constant       HADSA
constant      .336944     -.039056
HADSA        -.039056      .006651

*************************************************************************
**
OUTCOME VARIABLE:
 ghp

Model Summary
        R          R-sq       MSE          F          df1          df2          p
     .673103     .453067     .331851    73.311435     2.000000   177.000000     .000000

Model
                coeff         se          t          p        LLCI       ULCI
constant     1.587814     .260564     6.093766     .000000     1.073602     2.102025
HADSA        -.008354     .013400     -.623418     .533812     -.034799     .018091
Funct         .090817     .009811     9.256545     .000000     .071455     .110179

Standardized coefficients
          coeff
HADSA     -.043502
Funct      .645914

Covariance matrix of regression parameter estimates:
          constant       HADSA        Funct
```

constant	.067893	-.002688	-.002445
HADSA	-.002688	.000180	.000079
Funct	-.002445	.000079	.000096

****
**
OUTCOME VARIABLE:
HRQoL

Model Summary

R	R-sq	MSE	F	df1	df2	p
.595741	.354907	428.829087	32.276308	3.000000	176.000000	.000000

Model

	coeff	se	t	p	LLCI	ULCI
constant	57.259676	10.302457	5.557866	.000000	36.927411	77.591941
HADSA	-1.327414	.482241	-2.752596	.006532	-2.279133	-.375695
Funct	1.317428	.429655	3.066245	.002510	.469488	2.165368
ghp	6.802367	2.701993	2.517537	.012711	1.469888	12.134846

Standardized coefficients

	coeff
HADSA	-.209420
Funct	.283882
ghp	.206093

Covariance matrix of regression parameter estimates:

	constant	HADSA	Funct	ghp
constant	106.140612	-3.570448	-2.107153	-11.592256
HADSA	-3.570448	.232556	.097157	.060991
Funct	-2.107153	.097157	.184603	-.663035
ghp	-11.592256	.060991	-.663035	7.300765

********** TOTAL EFFECT MODEL
****
OUTCOME VARIABLE:
HRQoL

Model Summary

R	R-sq	MSE	F	df1	df2	p
.470451	.221324	511.812996	50.593214	1.000000	178.000000	.000000

Model

	coeff	se	t	p	LLCI	ULCI
constant	117.221832	2.983958	39.284003	.000000	111.333342	123.110322
HADSA	-2.981958	.419233	-7.112891	.000000	-3.809265	-2.154651

Standardized coefficients

	coeff
HADSA	-.470451

Covariance matrix of regression parameter estimates:

	constant	HADSA
constant	8.904008	-1.032080
HADSA	-1.032080	.175756

********** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **********

Total effect of X on Y

Effect	se	t	p	LLCI	ULCI	c_ps	c_cs
-2.981958	.419233	-7.112891	.000000	-3.809265	-2.154651	-.116638	-.470451

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI	c'_ps	c'_cs
-1.327414	.482241	-2.752596	.006532	-2.279133	-.375695	-.051921	-.209420

Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
TOTAL	-1.654545	.317717	-2.287413	-1.054731
Ind1	-1.087680	.348450	-1.823849	-.434526
Ind2	-.056827	.114438	-.312261	.162640
Ind3	-.510038	.259207	-1.061924	-.024507
(C1)	-1.030852	.391155	-1.834730	-.278857
(C2)	-.577642	.521270	-1.628058	.436710
(C3)	.453211	.281842	.013509	1.090043

Partially standardized indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
TOTAL	-.064717	.011463	-.087450	-.042464
Ind1	-.042544	.013136	-.069752	-.017711
Ind2	-.002223	.004516	-.012537	.006386
Ind3	-.019950	.010066	-.041081	-.000915
(C1)	-.040321	.014823	-.070321	-.011178
(C2)	-.022594	.020331	-.063532	.017424
(C3)	.017727	.010881	.000553	.042353

Completely standardized indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
TOTAL	-.261031	.047827	-.355653	-.168292
Ind1	-.171599	.054212	-.285992	-.069081
Ind2	-.008965	.017934	-.049588	.025647
Ind3	-.080467	.040189	-.161508	-.003623
(C1)	-.162633	.060807	-.286574	-.044510
(C2)	-.091132	.082149	-.257277	.067919
(C3)	.071501	.043518	.002055	.168731

Specific indirect effect contrast definition(s):

(C1) Ind1 minus Ind2

(C2) Ind1 minus Ind3
(C3) Ind2 minus Ind3

Indirect effect key:
Ind1 HADSA -> Funct -> HRQoL
Ind2 HADSA -> ghp -> HRQoL
Ind3 HADSA -> Funct -> ghp -> HRQoL

********** ANALYSIS NOTES AND ERRORS **********

Level of confidence for all confidence intervals in output:
95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
5000

------ END MATRIX ----