ISSN Online: 3006-4708
ISSN Print: 3006-4694

SOCIAL SCIENCE REVIEW ARCHIVES
https://policyjournalofms.com

Mental Wellbeing and Drug Adherence Among Patients With Chronic and Acute Diseases: Moderating Role of Optimism

Bakhtaj[1], Dr. Andleeb Akhtar[2]
[1] MS, Psychology, Department of Psychology, University of Haripur, Khyber Pakhtunkhwa.
[1] Lecturer, Department of Psychology, University of Haripur, Khyber Pakhtunkhwa.

DOI: https://doi.org/10.70670/sra.v3i4.1216

Abstract
Poor drug adherence is a significant public health concern, resulting in reduced treatment effectiveness, increase health care costs, and decreased quality of life. The study was intended to reveal the relationship between mental wellbeing and drug adherence as well as the moderating effect of optimism on a sample of 300 participants from different health care facilities of district Haripur, Pakistan. The study was based on cross-sectional survey research design and purposive sampling techniques was used. The Warwick-Edinburgh mental wellbeing scale (WEMWBS), Drug Attitude Inventory (DAI-10), and Life Orientation test (LOTR-R) were administered to assess mental wellbeing, drug adherence and optimism respectively. The alpha reliabilities were found out to be .98 , .79 and .46 of all three scales respectively . The reason of low reliability of life Orientation test may be response biases of the participants due to cultural variations and individual differences like cognitive abilities, personality traits and emotional state etc. Descriptive statistics, correlation, regression moderation analyses, and ANOVA were conducted to analyze data. The study found that there exists a highly significant positive correlation between mental wellbeing and drug adherence as well as mental wellbeing was a statistically significant predictor of drug adherence, and the optimism positively moderated the relationship between variables. Among demographic variables (age, gender, nature of disease, type of treatment, type of disease) only nature of disease and type of diseases have significant impact on mental wellbeing and drug adherence.

Keywords: Drug Adherence , Mental Wellbeing , Optimism, Acute & Chronic Diseases

Introduction

Mental health is a condition of mental wellbeing which includes emotional, psychological and social well-being. This includes how people think, feel, and act; its importance is seen in the way that it can affect how an individual will deal with stressors, as well as make choices. Mental well-being is a foundation for physical health and life quality from more general perspective (Kring & Johnson, 2022). Common mental health conditions like depression, anxiety, bipolar disorder and schizophrenia can have a profound impact on an individual's overall well-being. It can result in a wide range of physical health problems, including chronic diseases (heart disease and diabetes), while such conditions may also worsen physical health issues already experienced by individuals with mental illness. One major reason is that mental health problems can lead to changes in behaviors like diet, exercise and sleep effects on physical health and mental health is an important factor in disease prevention and management (Stanga et al., 2019). The association between mental health and overall physical well-being is reinforced by the biological mechanisms that mediate mind-body interactions. A common result of low mental well-being is chronic stress, which may cause long-term overproduction of the hormone cortisol in turn weakening immune system defenses, so blood pressure

increases and is at risk from developing heart disease plus other major health conditions (Alswedani et al., 2023). Treatment of mental health disorders requires a holistic approach which includes medical and psychological treatments together (Kring & Johnson, 2022).

At the broader level promoting mental well-being includes development of supportive environments that help to gain mental health. This involves the adoption of policies to reduce stigma associated with mental health conditions, opportunities for more investment in mental health services and greater awareness surrounding public strategies. That is why schools, workplaces and communities are critical in providing the resources and structures of support needed to foster mental health promotion. Prioritizing mental health improves overall health outcomes, reduces healthcare costs and increases quality of life for individuals and communities (Kring & Johnson, 2022). Depression, anxiety and stress are common mental illnesses which had negative long-term effects on the drug adherence in all the chronic diseases such as diabetes, hypertension, asthma (Ahmed, 2021). Mental health problems like anxiety, which are characterized by excessive worry or fear, also may have a substantial impact on drug adherence. Anxiety disorders can amplify a person's stress response, making it more difficult to adhere with medications taken consistently (Stanga et al., 2019). Chronic stressors may interfere with adherence behaviors, ultimately resulting in protracted illness courses and higher healthcare service utilization (Cassidy, 2022).

The degree to which a patient takes his or her medication as prescribed by his prescriber is referred to as Drug adherence and can include dosing, frequency of administration, method of taking the drug. This is a very important principle in managing patients with both acute and chronic diseases, designed to provide the maximum therapeutic benefits of their medications leading this way on one hand for lower risk of complications, but ultimately also improve overall health outcomes. Studies have consistently linked poor adherence to medications with greater morbidity and mortality, as well as increased healthcare costs due to higher hospitalizations or addition treatments (Culig, 2018).

Mental health and chronic disease management, recognizing that individuals with both common mental disorders (CMDs) and chronic medical conditions face unique challenges in adhering to prescribed treatment regimens. Factors that contributed to poor adherence included forgetfulness, lack of perceived need for medications, side effects, and limited healthcare access. Patients with both mental health and chronic physical conditions had even lower adherence rates compared to those with only one type of condition. Mental health symptoms such as depression and anxiety were particularly strong barriers to drug adherence. Additionally socio-demographic factors, such as lower education levels, financial difficulties, and living in rural areas with limited healthcare infrastructure, contributed to poor adherence. Patients in these areas often had limited understanding of their conditions or the importance of consistent treatment (Salazar et al., 2023).

Drug adherence among patients with both hypertension and diabetes, two chronic conditions often seen together. Factors included forgetfulness, lack of understanding about the importance of continuous medication, and the complexity of medication regimens. Socio-demographic factors such as age, gender, and education level were also found to affect adherence, with younger patients and those with lower education levels exhibiting poorer adherence rates. Patients who received more information and clearer instructions from their healthcare providers were more likely to adhere to their treatment plans., Improving drug adherence is critical for better disease management and reducing the risks of complications associated with hypertension and diabetes. Some patients stopped taking medications once they felt better or experienced side effects, which is a common issue in chronic disease management, more holistic approach, integrating medical and psychological support, could enhance adherence and lead to better management of both hypertension and diabetes (Makai & Baiee, 2022). Chronic diseases like diabetes & hypertension where patient drug adherence is important, In the case of diabetes, strict adherence to medications allows appropriate reduction in blood glucose levels and prevents complications resulting from hyperglycemia such as neuropathy, retinopathy or cardiovascular disease. In hypertension, likewise, maximal reduction of blood pressure (BP) is important to prevent stroke, myocardial infarction and renal impairment but also voluntarily taking medication will contribute to clinical outcome. However, for non-adherence in these conditions and

life-threatening complications that can result underscored the importance of patients maintaining their commitments to following treatment regimens (Doyle et al., 2019). Acute bronchitis due to bacterial or viral infections may resolve when treated with appropriate antibiotics or antivirals, as recommended (Kızılırmak & Yorgancıoglu, 2023). For long-term diseases such as diabetes and hypertension, supports that encourage adherence may include more frequent physician's visits, reminders or use of pill organizers to aid in compliance (Cassidy, 2022).Automated text message reminders have demonstrated in some studies to increase drug adherence among patients with chronic conditions which results in improved disease control and less complications (Senbekov et al., 2020).Comprehensive model ensures that patients receive holistic, personalized medical treatment and support to enhance adherence leading to better clinical outcomes (Senbekov et al., 2020). Acute diseases like diarrhea and bronchitis are timely and appropriate medicine adherence forms the key to good management. Healthcare providers should clearly explain the increase in risks of non-adherence and give precise instructions to persuade patients to conform strictly to their treatment plans (Cookson et al., 2018).

Medication nonadherence is associated with serious health consequences in a variety of diseases. Thus, in diabetes being non-complaint with prescribed medications can result in uncontrolled levels of blood glucose and therefore much higher risk for short-term as well as long term complications. Diabetic ketoacidosis and hyperosmolar hyperglycemic state are acute complications which should prompt immediate medical attention. Eventually, nonadherence can evolve into lifelong complications such as nephropathy, retinopathy and neuropathies followed by cardiovascular diseases that not only impact the quality of life but also bring increase in mortality rates (Ahmed, 2021). Poor adherence to antihypertensive medications frequently produces uncontrolled blood pressure which increases cardiovascular risk especially for heart attacks and stroke in hypertension. Poor adherence worsens organ damages including left ventricular hypertrophy, heart failure and chronic kidney disease in patients. These are biochemical outcomes which not only enhance morbidity and mortality but also incur heavy financial burden of more aggressive treatment modalities including hospitalizations (Choudhry et al., 2022). Worldwide, the burden of chronic and acute diseases is considerable; diabetic mellitus particularly type 2 diabetes (T2D), along with hypertension are major contributors to said problem. Diabetes and hypertension account for two of the most common chronic conditions in an increasingly ailing population, creating substantial hurdles to public health (Hajat & Stein, 2018). The International Diabetes Federation (IDF) type 2 diabetes is a leading cause of cardiovascular disease and an enormous global burden including blindness, kidney treatment or care failure (e.g. dialysis), amputations, contrasting end stages of life declined quality-based systems (Hajat & Stein, 2018). hypertension (high blood pressure) affects a large proportion of global population. The World Health Organization has estimated that globally, more than 1.13 billion sufferers of high blood pressure are to be found (WHO), the majority living in low- and middle-income countries. The burden of hypertension is expected to increase and will likely be driven by the adoption of unhealthy diets (especially those high in sodium), physical activity levels, alcohol consumption and an increasing prevalence obesity. High blood pressure is a leading cause of cardiovascular disease, such as heart diseases and stroke; it can also damage the kidneys and produce other serious health consequences. Hypertension is a key risk factor for CVD and effective management, or prevention of hypertension can result to decrease in cardiovascular diseases on global scale (Schutte et al., 2021). Increasing prevalence of diabetes and hypertension in several countries burdens healthcare systems, highlighting the need for public health interventions as well as policies that are progressing towards more effective (Hajat & Stein, 2018).

In addition, diabetes and hypertension are closely associated with some social determinants of health like income status, education level or healthy nutrition (Doyle et al., 2019). Acute diseases are often overshadowed globally by the burden of chronic disease, but they still drive major health challenges in settings where healthcare infrastructure remains weak (Shafiq et al., 2021). The interconnectedness of chronic diseases underscores the necessity of a more whole-patient approach to health. If the prevention, early detection and treatment services for both chronic as well as acute diseases are

integrated within primary healthcare systems it can not only improve health outcomes but also help to reduce disease burden (Doyle et al., 2019). Acute conditions like diarrhea and bronchitis are still an important public health issue worldwide (Kızılırmak & Yorgancıoglu, 2023). Adulthood diarrhea which may reflect both large resource consumption for addressing this condition and potential loss to workforce productivity due to parents staying home with sick adults (Black et al., 2019). In a study from a US perspective, estimated the clinical and economic burden of acute bronchitis is a great burdon on both healthcare systems as well as societies (Cookson et al., 2018). On a societal scale, these short-term diseases maintain the poverty cycle and negative health effects. Recurrent episodes of diarrhea can also result in malnutrition and growth deficiency among kids, which can challenge their physical and brain development as well. Women in Sub-Saharan are regularly faced with the burden of needing to care for sick family members, and as a result must frequently drop out of school or pass on career opportunities. In the most vulnerable populations, such as aged patients suffering from various underlying conditions bronchitis can complicate into lethal complications claiming a greater number of deaths which result in decreasing life expectancy (Kiprop, 2020). In the context of bronchitis non-adherence to prescribed medications such as antibiotics or bronchodilators could lead to chronic symptoms and thus increased risk for complications i.e. pneumonia. Patients who do not complete antibiotic regimes also run the risk of creating resistant bacteria themselves, which stewards key respiratory concerns as well. So, it involves health of the person as a whole and also contributes to phenomenon that antibiotics do not work in your community (Dhingra et al., 2020).

Moreover, the consequences of mental health disorders on drug adherence much exceed the instant effects because signs akin to despair, anxiousness and stress are widespread in most psychological well-being circumstances (Alswedani et al., 2023). Long-term effects of stress on physiology can reduce the efficacy of medications, prolong symptoms and permission to heal (Doyle et al., 2019). Cognitive-behavioral interventions along with patient education programs may represent strategies to enhance treatment adherence and outcomes in respiratory conditions managing patients who do not adhere (Brite et al., 2020).

Optimism is an indiuidual's tendancy to expect favorable outcomes in various life situation (Scheier et al., 1994). Optimisim and gratitude were associated with higher drug- adherence to medical recommendation (diet,excercise,medication adherence stress reduction) in acute coronary syndrome (Millstein et al., 2016). They sugested that fostering optimisim and gratitude could aid in recovery from ACS, potentially enhancing both adherence and wellbeing.

Statement of The Problem

Mental well-being and drug adherence among patients with chronic and acute diseases are critical concerns in healthcare management. Patients with chronic and acute illnesses often face challenges in adhering to prescribed medication regimens, which can result in treatment failures and increased healthcare costs. Mental health issues, such as depression and anxiety, can further complicate adherence to medication, leading to poorer Shealth outcomes. This study aims to explore the intricate relationship between mental well-being and drug adherence, with a particular focus on the moderating role of optimism.

Objectives

1. To investigate the predictive relationship between mental wellbeing and drug adherence among patients with chronic and acute diseases.
2. To examine the moderating role of optimism between the relationship of mental well -being and drug -adherence among patients with chronic and acute diseases.
3. To study mean differences of demographic variables (age, gender, nature of disease, type of disease) on mental well-being, optimism and drug adherence among patients with chronic and acute diseases.

Research Hypothesis

1. Mental well-being and optimism will be positively correlated with drug adherence among patients with chronic and acute diseases.
2. Mental well-being and optimism will positively predict drug adherence among patients with chronic and acute diseases.
3. Optimism will positively moderate the relationship between mental well -being and drug – adherence among patients with chronic and acute diseases.
4. There will be significant gender differences on mental well-being, optimism and drug adherence among patients with chronic and acute diseases.
5. There will be significant age differences on mental well-being, optimism and drug adherence among patients with chronic and acute diseases.
6. There will be significant differences in nature of disease on mental well-being, optimism and drug adherence among patients with chronic and acute diseases.
7. There will be significant differences in type of disease on mental well-being, optimism and drug adherence among patients with chronic and acute diseases.

Significance of Study

This study addresses a critical gap in literature by examining the interplay between mental well-being and drug adherence among patients with chronic and acute diseases, with a focus on the moderating role of optimism. The findings have significant implications for healthcare management, chronic disease management, public health policy, and the development of interventions to improve drug adherence and overall quality of life for patients. Understanding these relationships can lead to improved treatment outcomes, reduced healthcare costs, and enhanced well-being for patients facing both mental health challenges and chronic or acute diseases.

Literature Review

Mental well-being is defined by a variety of states and constructs, each with its own determinants leading to more specific outcomes or descriptions as can others-someone's life could have gone off in one direction after experiencing any these events. Depression, one of the most common mental health disorders in aging individuals, includes symptoms such as prolonged sadness and feelings of worthlessness or hopelessness. It is frequently accompanied by marked impairment in functioning. Depression is believed to be linked with changes in brain structure, volume of the hippocampus and neural circuits involved in mood regulation. Additionally, suffering chronic stress and carrying certain genes predisposes to depression (Kring & Johnson, 2022).

Contrary to depression, anxiety is a condition marked by one experiencing an intense amount of worry and fear directed toward the future. Anxious alertness can manifest physical symptoms, including racing heart and insomnia. It has been shown that anxiety disorders may associate with dysfunction of the amygdala and prefrontal cortex, key areas in emotional processing (and executive function) i.e. regulatory processes governed by these two brain regions. Depression, while a negative mood state happens at every single moment of everyday, anxiety is instead rooted in anticipatory worry and doom-mongering. Nevertheless, both conditions can co-occur and be accompanied by a more complex clinical profile that calls for special therapeutic procedures (Stanga et al., 2019).

Anxiety and stress, although used interchangeably very often actually are not the same thing; When someone says they're stressed out what they really mean to say is that they're Anxious! This can be an acute or chronic response to stress, with the latter example resulting in dysfunction which contributes to disease and illness. When the body responds to stress, stresses such as high partisanship activate of the HPA axis leading to cortisol release. Sustained activation of this response system can contribute to the development of an array of health problems including hypertension, cardiovascular disease and psychological disorders such as depression and anxiety. More common language used to describe such experience might be tensions its process or response vs anxiety and depression emotional states & disorders (Ahmed, 2021).

Emotional well-being, on the other hand, is a very wide range of study and approaches to overall positive mental health. With happiness and good mood, a life full of contentment and aim in working out things to come for, as well as behaving also being psychologically adaptive ability to handle stressors! In mediating the association between adverse childhood experiences and mental health disorders, emotional well-being functions as a protective factor for an individual. Research shows that people who are high in emotional well-being have more resiliency and better health outcomes. Emotional well-being is recognized by its positive constructs rather than their opposites which define depression, anxiety and stress (Hernández-Torrano et al., 2020).The assessment of mental well-being refers to a variety of quantitative and qualitative instruments that aim to measure constructs such as depression, anxiety, stress or emotional well-being in research situations. In reality, each of these is actually a different construct and so should be assessed separately in order for the results to support what it really happening with an individual's mental health (Hernández-Torrano et al., 2020).

The usual instruments measuring depression are standardized self-report questionnaires, clinical interviews and observational methods among others. The Beck Depression Inventory (Bashir & Ondigo), Patient Health Questionnaire-9 (PHQ-9) and Hamilton Depression Rating Scale I3-6 are well-established instruments used to assess the severity and presence of depressive symptoms. These tools will assess different aspects of the depression, such as mood symptoms, cognitive changes and physical manifestations. An example is the PHQ-9, which has 9 items that correspond to diagnostic criteria for major depressive disorder and hence can be both a clinical diagnosis or assessment of symptom burden (Bot et al., 2017).

The assessment of anxiety is likewise based upon self-report scales, clinical interviews and physiological measures. The State-Trait Anxiety Inventory (STAI) is an assessment distinguishes between temporary anxiety (state anxiety) and more enduring tendencies to feel anxious, stressful or nervous. Probably the most popular screening tool is the Generalized Anxiety Disorder 7-item scale (GAD-7) which measures how often symptoms of excessive worry, restlessness and muscle tension have been experienced over a specific interval. Moreover, individuals are able to examine the somatic aspects of anxiety through physiological measures including heart rate variability and skin conductance assessment (Bot et al., 2017). The examination of stress often can take both objective and subjective directions. Subjective measures, such as self-report scales, need to be used (e.g., Perceived Stress Scale: PSS), which are psychometric tools that attempt to investigate the degree of how unpredictability, uncontrollability and overruled an individual perceives his life. Less-frequent objective measures might include biologic markers like levels of cortisol to measure physiologic stress response hormones. The Trier Social Stress Test is an experimental method used to induce acute psychosocial stress reactivity in a controlled environment, elicit behavioural and physiological responses including neuroendocrine activation (Chan & La Greca, 2020).

The Positive and Negative Affect Schedule (PANAS) assesses positive affectivity as well negative emotions, which is essential to separate emotional quality from the absence of evolutionarily conserved unpleasurable states. Satisfaction with Life Scale (SWLS) is a widely used measure of global cognitive judgments that people make about the quality or conditions of their own lives as they are experiencing them (a key indicator to emotional wellbeing). Moreover, such a holistic view of emotional well-being is complemented by the Psychological Well-being Scale (PWB), developed in 1989 to cover autonomy, environmental mastery, personal growth and purpose in life (Hernandez-Torrano et al., 2020).

These constructions are longitudinally assessed in research to understand how mental well-being changes over time, shedding light on its dynamic quality. Integrating several different measurement methods, such as self- and clinical-rated assessments along with physiological indices improves the reliability of conclusions. The multimethod approach in the study helps overcome these limitations, reducing reliance on single source or self-report data which can be affected by social desirability biases and subjective illusory correlations. The usage of a variety of tools will inform in comprehensiveness the very complex interplay among various components of an individual well-being and their effects on life as a whole (Chan & La Greca, 2020).

Mental Well-being and Chronic Diseases

Several studies have suggested that psychological aspects play a role in medication compliance for certain patients, and the complex relationship between mental well-being and adherence to medications among adult patients with diabetes (DM) or hypertension is particularly of concern. The finding that poor mental well-being (including symptoms of depression and anxiety) is often accompanied by less adherence to prescribed medication. (Hajat & Stein, 2018) suggested that patient with diabetes who have concurrent depressive symptoms might be less likely to adhere to pharmacological treatment of their depression due to partly loss in motivation and cognitive decline commonly associated with the condition. Likewise for anxiety, the patient may worry about side effects from their medications and therefore discontinue or use them intermittently.

Besides the direct association of psychological symptoms with drug adherence, general aspects, such as quality of life and self-efficacy, were taken into consideration. Patients that feel good about their health and are convinced they can manage the disease tend to be more compliant for better or worse. A study by (Huang et al., 2018) found that diabetic patients with higher levels of self-efficacy were more likely to adhere both in terms of drug adherence and lifestyle changes, thereby supporting the idea that nephrology intervention aiming at increasing confidence would have an effect on improving compliance rates. The burden of having to take care of and cover some, if not all aspects of their chronic conditions will undoubtedly negatively impact mental well-being which leads us again full circle with regards supervening adherence behaviors.

Moreover, linked to this mention of psychotic disorder and finally relevant in relation between mental health with drug adherence is socio-economic-cultural factors. Further burdens are faced by poorly resourced or socially isolated people as they have reduced access to psychological support and increased experience of helplessness, which in turn could be linked with lower rates of adherence. Additionally, cultural beliefs regarding health and disease have been shown to influence the way patients perceive their illnesses as well as patient compliance with medical advice. (Gureje et al., 2015) reported social beliefs related to illness, physical charges for belief in treatment of traditional medicine at public health institution), sociocultural issue in food not eating nutritious meals as a diet control by their culture, medication effect on body or mind and face shape change due to chronic medical problem, presence stigma among hypertensive patient hence it may contribute the suboptimal adherence rates.

Additional findings from adult diabetes and hypertension studies have further demonstrated this intricate relationship between mental states and treatment compliance. This is illustrated by the study of (Berghoff et al., 2018) that indicated emotional support to be consistent with increased adherence. Among their findings was that patients reported higher adherence rates when they had strong social support, suggesting the importance of buffering against reduced mental health with a psychologically sound network. Tangible support is an example of social activation intervention that could help heighten drug adherence.

In addition, the dozens of studies demonstrating that professional interventions increase compliance would also apply for psychological treatments. (Bot et al., 2017) found that compared the efficacy and tolerability of newer antidepressants with placebo in treating major depressive disorder. It has been shown by (Kring & Johnson, 2022) that cognitive-behavioral therapy (CBT) is associated with a decrease in depressive symptoms, better drug adherence among diabetics. In addition to the improvements in mental health outcomes, those with reduced cognitive distortions and increased use of positive coping were also significantly more likely to adhere to their medication regimen. This is in line with the overall literature that demonstrates the clinical importance of psychological interventions as a part long-term management for chronic disease.

In addition, drug adherence and mental well-being are both influenced by disease perception so that the indirect effects of prescription probably go through how patients perceive their illness. Research by (Mosleh & Almalik, 2016) reported a high correlation between patient illness representations, which were measured in terms of perceptions of severity and personal control over one's disease process and adherence behaviors. Certain patients who perceived their illness to be more severe and

less uncontrollable were less likely to adhere to treatment. These results provide a rationale for intervention studies addressing illness perceptions that are associated with low adherence to change such beliefs, and benefits from psychological regimes since higher improvement in depressive symptoms were observed during the trial.

The 2-way relationship between adherence and mental health is also critical. Not only does poor mental health led to non-adherence, but also the lack of adherence helps exacerbate the original issues again. The study also found that untreated patients become more depressed as time goes by, which decreases their ability to manage the disease, generating a vicious cycle. This finding suggests a vicious circle, necessitating holistic treatment practices that consider physical and emotional aspects of the disease.

One cannot ignore the influence of health literacy on relation between mental well-being and adherence (Hajat & Stein, 2018). Patients with lower health literacy, who typically have difficulties in understanding medical information and using the healthcare system, are at increased risk for poor mental health outcomes and non-adherence. The research suggested that by raising both health literacy levels through patient education, and clear communication tools could foster treatment comprehension among patients leading to better adherence and mental health outcomes.

Psychological factors affect chronic diseases medication compliance, such as diabetes and hypertension related to various interacting mechanisms. A central process is that of the effect on patient motivation and cognition secondary to psychological distress (such as depression and anxiety). Depression typically contributes to reduced energy, decreased attention to self-care practices and impaired cognition, thus compromising the ability of depressed patients swallowing their medications unless nonadherence is explicitly targeted in a behavioral intervention designed for this population. Examples include difficulty arranging or remembering to take medications in a timely manner, resulting on and off adherence for the patient with severe symptoms of depression (Doyle et al., 2019).

Mental well-being affects by correspondingly influencing self-efficacy and perceived control over one's health. Applying self-efficacy, an individual's confidence in executing behaviors to manage health conditions, is key for adherence. Those with high mental well-being score higher on self-efficacy and are more likely to adhere. Poor states of mental health can conversely cause decreased self-efficacy and is associated with greater likelihoods of non-compliance. For example, someone with anxiety or depression in place may look at their health issues and feel they are too big to manage and thus its easier for them to not follow along what they have been told (Kring & Johnson, 2022).

Stress, in turn, plays a role in adherence medication. Poor physical health can be dramatically worsened by chronic stress, which is compounded in individuals who are prone to mental issues and may impede compliance. It is well-known that stress can cause physiological alterations to the body, which impact disease management and even drug efficacy. Adherence in chronic illness can be difficult; even stress will prevent people from taking Varenicline. Stress also can lead to unhealthy coping strategies, including skipping medications and engaging in poor health behaviors.

Social support and interpersonal relationships have been found to mediate the effects of many psychosocial variables on adherence. Patients who have better-stronger social support are found to possess relatively good mental health and adhere frequently toward medications. A review by (Culig, 2018) points out the psychological encouragement of support provided by family and friends can help, as this feeds into drug adherence. Conversely, loneliness or lack of support can make mental health issues worse and result in non-adherence.

In addition, the mental wellness of patients affects their health beliefs and attitudes in utilizing treatment. Patients with good mental health also tend to have higher levels of adherence and positive beliefs about their treatment, whether in the effectiveness of their medicines or his resolve to self-manage. Conversely, negative health beliefs and attitudes, in some cases associated with poor mental health make people skeptical of what they are being advised to do leading if questioned without precision over whether a treatment is necessary or effective after all which can lead as one might expect lower adherence.

The connection between mental health and adherence is expressed in these relationships in an overall,

complicated fashion. Psychological distress impairs motivation and cognitive function, lowers self-efficacy and perceived control, affects stress levels as well as coping strategies adopted by individuals in a community or society mobilize physiological response that activate health beliefs such perception of risk to infection. Key interventions address mental health concerns, as this issue must be addressed if drug adherence is to improve among patients with chronic diseases like diabetes and hypertension (Doyle et al., 2019).

A study evaluated drug adherence among patients with chronic diseases in recognizing that adherence is a critical factor in managing chronic conditions and preventing complications. The research involved a large cohort of patients with chronic conditions such as hypertension, diabetes, and cardiovascular diseases. The results revealed that the overall adherence rate was moderate, with a significant portion of patients reporting difficulties in following their prescribed medication regimens. Non-adherence included forgetfulness, lack of understanding about the importance of medications, and the complexity of treatment regimens. Patients who experienced medication side effects were also more likely to discontinue or skip doses. The role of socioeconomic factors, such as education and income, in influencing adherence rates, with individuals with lower education levels and financial difficulties reporting poorer adherence. The importance of healthcare provider communication in improving adherence, as patients who received clear and thorough explanations about their treatment plans were more likely to follow them. The authors suggested that patient education and counseling be enhanced to address misconceptions and encourage better understanding of chronic disease management. It also recommended strengthening the healthcare system's support for patients with chronic diseases, particularly through better communication and accessibility of care, to improve drug adherence and health outcomes (Alosaimi et al., 2022)

A study conducted to determine how health locus of control, stress coping styles, and mindfulness influence the likelihood of adhering to prescribed medication regimens. The patients who had a strong internal health locus of control, meaning they believed that their health outcomes were largely under their own control, were more likely to adhere to their medications. Additionally, higher levels of mindfulness, which involve being attentive and aware of present experiences, were associated with better drug adherence. Conversely, patients who relied more on emotional coping strategies, such as avoidance or emotional expression, showed lower adherence rates. Fostering a strong internal health locus of control, encouraging mindfulness, and promoting adaptive coping mechanisms could be effective strategies for improving drug adherence in patients with chronic diseases. The patients with a higher level of mindfulness tended to be more engaged in their treatment plans, demonstrating a stronger sense of responsibility for their health. It was emphasized that a psychological approach to chronic disease management could complement traditional medical treatments by improving adherence and overall well-being. Moreover, they suggested that healthcare providers should incorporate psychological assessments into routine care to better understand the barriers patients face in adhering to medication regimens. By addressing the psychological factors such as health locus of control and coping strategies, interventions could be more personalized and effective (Bąk-Sosnowska et al., 2022).

Mental Well-being and Acute Diseases

Studies of adult patients with acute illnesses (e.g., Diarrhea or Bronchitis) were largely concerned how mental well-being affects drug adherence. We've learned from research that mental well-being is key to patient adherence with prescribed therapies. One example is the investigation by (Čulig, 2018) reported in acute diseases like diarrhea and bronchitis, the greater anxiety or depression was exhibited lower adherence for medication schedules. Poor adherence is influenced by a lack of ability to remember when and how many times per day one has taken their SIS and thus, cognitive dysfunction Ing as memory or attention deficits which are crucial for effective medication management.

In addition, there is evidence that a positive social context may counteract the negative influence of low mental well-being on adherence to medication. (Kızılırmak & Yorgancıoğlu, 2023) also identified in a systematic review that patients with acute conditions reported higher rates of adherence when they

were supported by family members or healthcare professionals. Patients who expected to be emotionally supported and adequately informed about their illness would more probably stick with pills, even if they were also fighting symptoms of different mental distress. Patients with bronchitis in (Kızılırmak & Yorgancıoğlu, 2023) were reported to be more adherent if they perceived strong support network and had access mental health resources symptoms of anxiety because of supportive environment, consistent use counselling services provide information about purpose medications, on the other hand well organized plans will help improve adherence.

A further important point is the impact that interventions for mental well-being have on improving adherence to medication. Some studies have shown that psychological interventions, such as cognitive-behavioral therapy (CBT) and mindfulness training may be beneficial in improving adherence rates among patients with acute illnesses. Proper analysis showed that those interventions with immediate effects on symptoms of anxiety and depression allow patients to concentrate much more fully in their health management, particularly drug adherence. This was particularly obvious among patients presenting with acute diarrhea in whom psychiatric well-being had direct consequences on drug adherence to drug and quality of life recovery (Culig , 2018).

The relationship between mental health and recovery from adult illnesses, apart from diarrheal bronchitis or acute disease among adults-is a topic that has been examined in medical literature. Patients with acute stress or depressive symptoms, e.g. those who are experiencing a bronchitis attack, are another example; such people probably adhere less to their medication regimen for chronic conditions like this one. The results of the study demonstrated that sufferers with acute disease appeared to undertake more psychological load into consideration mental disorder, and therefore building a vicious circle in which sudden morbidity exacerbates poor emotional well-being as it only adds up on reducing incapacitates health managing (Hernández-Torrano et al., 2020). An additional indication of this relationship was published by (DuPont, 2016), with adherence trends during the course among individuals not diagnosed with acute diarrhea. The researchers noted that patients with higher baseline depression scores were much less likely to be adherent, especially in the first few months of treatment. The decreased motivation and cognitive capacity commonly seen in depressed patients was believed to contribute to this overarching relationship, making it difficult for such individuals to reliably adhere with taking medications. Accessibility may be mediated by psychological resilience which has been shown to directly impact adherence. (CE Hayes, 2016) investigated the impact of resilience factors, such as optimism and coping strategies on adherence in acute bronchitis patients. Specifically, higher levels of resilience scores were found to be related to improved adherence in people regardless of mental health diagnoses. These results would imply that implementing interventions to increase resilience in patients with acute medical conditions is a strategy worth pursuing to curb non-adherence rates as these strategies can act as buffers against the adverse consequences of poorer mental well-being.

It also points to the effect of long-term psychological sickness on adherence with direction provided for penetrating conditions. The landmark study by (Stanga et al., 2019) found that patients with a history of chronic anxiety disorders had significantly lower rates of adherence to self-management practices in acute conditions available over the counter such as diarrhea. The results indicate that chronic psychological distress could be resulting in a long-term state of hypervigilance and worry which can make patients physically exhausted, distracted by their health concerns as well as decrease adherence to treatment regimens.

In addition, I stress the role that health care provider-patient communications play as a mediator between mental well-being and adherence. (Hajat & Stein, 2018), report a decrease of 36% in medication compliance among adults with acute bronchitis if healthcare provides did not provided clear understanding information. The investigators found that when patients had sense of being understood, they did better as far as adherence was concerned. This is consistent with the results of other studies indicating that a relatively simple measure to improve adherence can be achieved by improving patient-provider communication.

A further difference is observed when comparing the association between mental well-being and drug

adherence in chronic vs acute conditions. It is widely reported in the literature that mental well-being and adherence to medical treatments are closely related, however there is a difference between chronic conditions where regular treatment might not produce immediate/direct benefit and those with acute illnesses. The chronicity of such conditions, especially diabetes and hypertension unnecessarily add to the psychological burden on patients rendering maintaining adherence over time more difficult. For example, (Čulig, 2018) had investigated the magnitude of platelet activation in non-infarct and infarct-related microvasculature through assessment of activity levels indices defined by endogenous-thrombin potential. Challenges for these participants living with chronic illness experiencing depressive symptoms in adhering to medical regimens may be due to the increased stressors they face cuss of their long-term treatment protocol and the reoccurring distress generated by having daily routine. This chronic stress and tangible time-based commitment can give rise to adherence fatigue, in which patients are simply fatigued by the ongoing burden of managing their disease leading them ultimately towards subordinate treatment agreement.

In acute illnesses such as bronchitis or diarrhea, the effects of overall mental well-being on adherence tend to be more instant and shorter-lived. The paper by (Kring & Johnson, 2022) has shown us that although psychological conditions like anxiety or depression can cause a lot of non-adherences in the beginning, these mental health problems are usually characterized by an acute onset and course with shorter duration in weeks to months for most individuals. This can often engender a more acutely necessary determination to adhere, which consequently results in the inhibition of many emotional distress burdens if it is in fact deemed crucial for immediate recovery. (Shafiq et al., 2021), for example pointed out that patients with acute illness will not adhere to acute treatment because of the transient mental distress and if on a long-term analysis this is again compared with patients suffering from chronic conditions where half-lives are 20 years then immediate adherence efforts may differ substantially.

One of these categories also includes nature and type of psychological approaches to improve adherence. In chronic diseases, interventions that focus on increasing general mental health and teaching long-term coping strategies are more effective. This is illustrated by (Doyle et al., 2019) who found that patients with long-term psychological support such as cognitive behavior therapy and lifestyle changes to address the continuous nature of their mental health issues had a much higher rate at adhering to treatment in chronic disease. By comparison, short-term interventions such as those that provide more immediate mental health support and symptom management are typically found to be effective. (Čulig, 2018) found that brief psychological interventions, predominantly in the form of psychoeducational support for patients with acute illness improved adherence only during treatment when designed to manage a more immediate impact on well-being rather than long-term resilience.

Mental well-being is important for treatment adherence in chronic and acute diseases of different nature. Long-term management of chronic illnesses tends to be a protracted struggle given the lasting experience both illness and their psychological effects which are seen with prolonged challenges to adherence. Acute illnesses have more immediate psychological effects and shorter treatment durations, the reasons for which they must be investigated to understand differences in adherence patterns. Drawing from psychological intervention approaches these novel objectives demand a personalized approach with chronic conditions requiring long-term support whilst acute symptoms necessitate short term, targeted interventions to improve adherence outcomes for various disease types (Kring & Johnson, 2022).

The Role of Optimism

Optimism is a mental attitude or world view that interprets situations and events as being best (optimized), meaning that in some way factors appear to work towards the broader, positive outcome of specifically rewarding experiences. It is the belief that struggles and failures are not withstanding but rather transitory. Optimism, in essence, is defined by this positivity bias; an optimistic person will tend to expect positive outcomes and have a generally hopeful attitude even when confronted with difficult situations (CE Hayes, 2016).

Optimists tend to be more resilient than their less-positive counterparts. The former, tendency to bounce back from adversity and perceive the problems as learning experiences that assist in helping us grow; and latter ability or commitment of sticking through whenever life tried jamming. The fact of a challenging linear path is also what gives form to the different trials when arisen with resilience, alongside often an optimistic faith in, that which makes one believe more firmly and confidently. Optimists have attainable goals and a trust in themselves to turn things around for the better as opposed to passively waiting just on chance.

Optimism also involves adaptive coping. This optimism then allows a person to use effective coping mechanisms, such as problem-solving and reaching out for help; rather than avoidance or denial. In addition, they are solution oriented and seek processes to be built positively. And this ability to change the structure of a negative circumstance into an encouraging one is another strong component for optimism; people that use it can succeed in functioning on the useful aspects connected with challenging situations as well as see downturns more like temporary rather than getting lasting and pervasive (CE Hayes, 2016).

Optimism also encases self-efficacy, or a belief in one's ability to influence outcomes and overcome challenges skilfully. This agency, a doer attitude, is one of the characteristics that helps optimists be proactive in addressing problems. It is also worth noting, that optimistic people are more likely to have strong social networks, and stronger relationships in general- so they tend to be further from disconnection than the less hopeful. Additionally, their positivity can help them be more approachable and supportive in maintaining friendships. Optimism is a positive state of mind in which negativity is kept at bay through belief; the thinking that all life events should end on an up note rather than down one. As the extent of these traits have deep impacts on over-all well-being as it plays a significant role in augmenting better mental and physical health outcomes (Tenney et al., 2015).

Hundreds of studies support the benefits of optimism as it relates to health outcomes. Better physical health is one major way in which optimism has been linked to gains. For instance, studies have shown that a positive attitude actually can reduce the likelihood of cardiovascular disease and high blood pressure (hypertension) in optimistic people. This believed to be via a few things like better food choices, stress management or immune function. Optimistic persons are more likely to exercise, eat properly and not smoke. This further reduces the physiological load of stress, as they are better able to adaptively cope with adversity (CE Hayes, 2016).

Optimism is also good for your mental health. Optimists trend toward lower depression and anxiety levels than their pessimistic brethren (Tenney et al., 2015). That this may be the case is because those who believe brighter days are in store tend to concentrate on what they sense as positive vibrations and through tyranny of hope, even amidst challenging times. This good feeling associated with optimism not only builds a healthy mind but leads to healthier relationships too, as optimistic people are seen as more agreeable and sympathetic. These social benefits, in turn, compound mental flourishing through enhanced relationships with others offering support .

In addition, optimism also affects the recovery from illness and surgery. Yes, studies show that optimistic patients are more likely to recover faster and do better after treatment! For instance, patients undergoing coronary bypass surgery who were more optimistic reported less pain following the operation and recovered quicker. Confidence other than optimism can enrich the optimism-health relationship as positive outcomes may be associated to proactive engagement in rehabilitation or adherence and following medication advices, except for a belief that good things will happen. On top of that, optimism has been connected to lower levels of inflammation and a more robust immune response all important for both recovery and health in general end quotes (CE Hayes, 2016).

The boons of a positive outlook extend to health in studies on longevity. The reason is not only reduced stress but also more healthy behaviors, healthier hearts and even stronger social connections. In fact, a longer life to optimism. As an illustration, one longitudinal study showed that optimists were less likely to die from major causes of death such as heart disease and infections than pessimists. The optimistic outlook of optimists towards life challenges may promote a more resilient role in confronting age-related health issues and qualitatively preserving their daily routine (Tenney et al.,

2015).
Studies have shown ample times that optimism is a potent predictor of health, first and foremost since it seems to play an essential role in several favourable medical results. Indeed, research shows that optimists are healthier. For example, (Amonoo et al., 2021) found in one study that optimism is linked with better risk factors for cardiovascular health like blood pressure and cholesterol. However, optimistic people tend to engage in healthier lifestyle behaviors like exercise and proper nutrition which also adds positively on their health status. They also show stronger stress management, which directly counters the impact of fight-or-flight response on immune function.
Optimism, on the other hand, is something that has been proven to reduce depression and anxiety and benefits psychological health. One example is that optimism consistently guards against symptoms of depression and anxiety. This in part is because optimism fosters a hope schema that allows optimists to reframe adversity and emphasize their lives positive. In addition, optimists are more likely to seek social support and this also improves their emotional resilience (CE Hayes, 2016).
There is other powerful evidence that optimism influences recovery from illness and surgery. For example, in the cardiac study noted earlier where they followed up a sample of coronary bypass patients for 6 months post-surgery, showed that optimists actually recovered more quickly from surgery with fewer further medical complications or time spent staying at home convalescing. The effect could be related to the patients' optimistic mindset and their willingness to being involved in their own healing process. Likewise, (Amonoo et al., 2021) also found that optimistic people are more likely to follow medical instructions and involve actively in their own recovery process which will increase positive health outcomes.
Moreover, optimism has been linked to increased immune function and decreased inflammation. One with all these health benefits of maintaining good relationships, your immune system is in better functioning making you less prone to diseases.(Stellar et al., 2015) found that optimist have more powerful immune response and lower inflammatory markers its prude them. It also suggests that optimism has some material effect on the way our body's function, where else could behaviours like resilience and stress-coping so manifest themselves?
A Research revealed that higher levels of optimism were significantly associated with better drug adherence and improved physical functioning. Additionally, patients who exhibited greater gratitude showed better mental health outcomes, including reduced symptoms of depression and anxiety. Optimistic patients were also more likely to actively engage in their treatment regimen, follow through with prescribed physical activities, and maintain a more positive outlook on their recovery process. Fostering optimism and gratitude may have a beneficial effect on both psychological and physical recovery following an acute coronary syndrome (ACS). It is important of addressing psychological factors in post-ACS (acute coronary syndrome) care, suggesting that interventions aimed at increasing optimism and gratitude could complement traditional medical treatments and enhance patient outcomes. Overall, the research highlights the potential for psychological interventions to improve adherence and quality of life in cardiovascular patients (Millstein et al., 2016).

Research Methodology

Sample/Participants
The study used a cross-sectional, survey research design. This design was especially appropriate for cross-sectional data that compare different groups at one point in time to investigate differences of psychological well-being, drug attitude and life orientation between patients with chronic and acute diseases (Gandolfi*et al*., 2021).

Population
It was a hospital-based study and the Patients visiting Government health facilities including BHU, RHCs and Civil Hospitals at Haripur. The population was involved two age groups who have been

diagnosed with chronic diseases (Diabetes and Hypertension) or acute diseases (Bronchitis and Diarrhea), aged between 20–65 years.

Sample Size and Sampling Technique

300 patients were recruited via purposive sampling. This method of non-probability sampling was used by inviting certain participants to become part pile and selected accordingly as per the inclusion criteria for the study. The sample was divided in half, with 150 people having chronic disease and the other 150 acute diseases. Inclusion Criteria

- Following participants were included:
- Patients having chronic diseases of diabetes mellitus and hypertension
- Patients having acute diseases of diarrhoea and bronchitis
- Participants were willing to participate voluntarily
- Patients who were on medication currently.

Exclusion Criteria

- Following participants were excluded:
- Patients having chronic mental disorder like schizophrenia and bipolar disorder
- Patients younger than 20 and older than 65
- Patients with chronic physical disability.
- Patients were suffering from speaking and hearing problems.

Research Instruments

For the purpose of data collection, the following standardized psychological assessment tools was utilized:

Warwick-Edinburgh Well-Being Scale

A 14-item scale that measures an individual's subjective well-being. It was focussed on positive mental health and captures a broad concept of well-being, including feelings of optimism, energy, and life satisfaction **(**Tenant et al., 2007). The scores on the relevant items are added together to determine the scores for mental wellbeing. The scale consists of 14 items. Responses categories range from 1 (none of the time) to 5 (all of the time), and a total score –which can vary from 1 to 70 – is determined by adding the scores from item 1 through 70. Recommended cutoff values for the severity levels considered to be severe, moderate, mild and good to high. Mental wellbeing: severe (low wellbeing) is equal to 14-32, moderate (moderate well-being) is equal to 33 -40, mild (mildly low wellbeing) is equal to 41-47, good to high is equal to 48 -70.

Drug Attitude Inventory

A 10-item scale designed to measure patients' attitudes towards their prescribed medication, including their beliefs about the necessity of the medication and concerns about potential adverse effects (awad et al., 1993)..The DIA-10 contain six items that a patient who is fully adherent to prescribed medication would answer as 'True' and four they would rates as 'False' answer shown in bold are scored plus 1 and answer shown in normal font are scored minus one. A positive total score indicates positive subjective response (adherent) and a negative total score indicates a negative subjective response(non-adherent).

Life Orientation Test

A 10-item scale was used to assess individual differences in generalized optimism versus pessimism. It helps in understanding how patients perceive their future, especially in the context of their health conditions (Scheier and carver., and Bridges 1994). The scale was consisted of 10 items .Responses categories ranges from 0 (strongly disagree) to 4 (strongly agree), and a total score –which can vary from 1 to 24 – is determined by adding the scores from item 1 through 24.This scale consist two sets of items ,sum items which includes 1,3,4,7,9 and 10 and filler items 2 ,5 ,6 and 8 .Filler items were

not scored as a part of the revised scale. Recommended cutoff values for the severity levels were considered to be high pessimism, moderate pessimism and low pessimism and high optimism .. Revised life orientation test: High pessimism (low optimism) scores from 0 to 5 ,moderate pessimism from 6 to 11 ,low pessimism from 12 to 16 and high optimism scosrs from 17 to 24.

Data Collection

In order to gather accurate, reliable information for this study steps were taken to ensure that the data collection process is carefully structured. The main data collection was carried out in the Govt health facilities of district Haripur i.e. Basic Health Units (BHUs), Rural Health Centers (RHCs) and Civil Hospitals. Study population included all patients with either chronic diseases (Diabetes and Hypertension) or acute conditions (Bronchitis, Diarrhea). Recruitment was purposive, targeted for participants who meet those criteria relevant to the research objectives of our study (Meena*et al*., 2018).

Participant Recruitment

Health facilities were approached, and participants were asked individually by the researcher while they attended their routine visit. Recruitments were taken in the form of a short presentation on what this study was involved, the researcher was made it clear that why we were conducting our research (i.e. that it is part of their role as citizens), and that participation in it was voluntary, further explained that how the data provided was only be reported at aggregate level so no one can be identified from any analysis undertaken and unique identifiers to combine records from different datasets kept on study participants secure. The study population included only those who provided written informed consent and was not severe mental or physical ill. The sample size was 300 patients, of which half, 150 had chronic diseases and the other acute diseases participants. However, for the participants in our study (age range 20 to 65 years),

Setting: Data was collected in a private, quiet location within the health facilities to allow participants to answer questions without interruption. A setting where honest and thought-out responses were more likely to be shared without impact from other patients or clinician staff members on daily basis from 30 participants data was collected only.

Assistance

Each participant was guided through the data collection process by the researcher to ensure consistency and reduce potential bias. The researcher through the moderator, clarified all parts of the test that poses a problem in understanding to make sure participants understood all issues before they reply.

Ethical Considerations

The strategies that were employed were:

Informed consent: Written informed consent was obtained for all participants. A consent form described the purpose of the study, procedures to be conducted, anticipated risks and benefits associated with participation in each step of this process as well as a right for any participant to leave trial at any time without penalties.

Confidentiality: The confidentiality of data was maintained in all respects.

Ethical Approvals: The study protocol was viewed and approved by an ethical review board before the data collection starts.

Debriefing: Following data collection, participants were presented with a debriefed form outlining the purpose of study and how findings might inform understanding psychological well-being in relation to chronic / acute diseases. This research design was described as a complete investigation with statistical analysis and ethical grounds for considering evaluation in psychological aspects of patients confronting chronic and acute illness at district Haripur

through validated tools.

Results

Table 1 *Socio Demographic Characteristics of the Participants*

Sample characteristic	f	%
Gender		
Male	118	62.7
Female	112	37.3
Age		
19-40 years	76	25.3
41-65 years	240	74.7
Nature of Disease		
Acute	144	48.0
Chronic	156	52.0
Type of Disease		
Diabetes mellitus	71	23.7
Hypertention	79	26.3
Acute bronchitis	75	25.0
Acute diarrhea	75	25.0

When the gender distribution of the participants in table 1 was analyzed, the participants 62.75% were male (118 persons) and 37.3% were woman (112 persons).when the age level of participants was analysed 19-40 age group was 25.3% (76 people) , 40-65 group was 74.7% (240 persons).According to nature of diseases the participants 48.0 % (144 patients) having acute diseases of Dairrhea and acute bronchitis and the participants 52.0% (156 patients) having chronic diseases of diabetes mellitus and hypertension. Similarly, the distribution of diseases in patients suffering from Diabetes mellitus was 23.7 % (71 patients), Hypertension was 26.3% (79 patients), Acute bronchitis was 25.0% (75 patients) and Acute diarrhea was 25% (75 patients).

Table 2 *Psychometric Properties for Scales (N═300)*

Scale	K	M	SD	Range		Crobanch's α	Skewness	Kurtosis
Mental well being	14	47.42	13.72	14-70	19-67	.98	-.76	-1.12
Optimisim	10	21.72	4.21	0-10	7-17	.46	-.45	-.95
Drug Adherence	10	23.07	5.68	0-10	0-10	.76	-.69	-1.09

The table 2 shows that the mean and standard deviation of mental well-being scale M═47.42 , SD═13.72 Cronbach's value is .98 which indicate excellent internal consistency , similarly mean and standard deviation of optimism scale M═ 21.72 , SD═4.21 with Cronbach's value .46 which indicate good internal consistency and mean

and standard deviation of drug adherences scale M= 23.07,SD=5.68 with Cronbach's alpha .76 which also indicated good internal consistency.

Table 3 *Descriptive Statistics and Corrlation Coefficients among Mental Well Being,Drug Adherence and Optimisim (N=300)*

Variables	1	2	3
1. Optimism	_		
2. Mental Well being	.47**	_	
3. Drug Adherence	.46**	.92**	_

** p < 0.01 level

Pearson correlation and descriptive statistics ,for study variables were calculated to test the hypothesis.. As it is clear from the results of the table 3 that all values carry significant positive correlation with P≤ .01.The revealed results supported hypthesis H1 of the study. Table 3 also revealed that Optimism had significant positive correlation with mental wellbeing (r=.47, p<.01) and drug adherence (r=.46 , p<.01). Mental wellbeing had significant and strong positive correlation with drug adherence (r=.92 ,p<.01).

Table 4 *Regression Coefficient of Mental Wellbeing and Optimisim on Drug Adherence (N=300)*

R=.930[a]

Variables	β	*SE*	*t*	*p*	*95% Cl [LL--UP]*
Constant	-19.48	.67	-29.13	.00	[8,18.16]
Mental Well being	.68	.02	17.10	.00	[.25,.32]
Optimisim	.28	.05	6.91	.00	[.27,.48]

R^2=0.865, Adjusted R Square=.864,p<.001) F=951.92

Regression analysis was computed for mental wellbeing and optimism as predictor variables and drug adherence as outcome variables. The adjusted R^2 value of .864 revealed that the predictors explained 86.4 % variance in the outcome variable with *F(*2,297)=991.92*, p*<.001.The finding revealed that mental wellbeing positively predicted drug adherence (β=.68,*p*<.001*)* whereas life optimism also positively predicted the drug adherence and has significant effect on drug adherence *(*β=.28,*p*<001*)*.

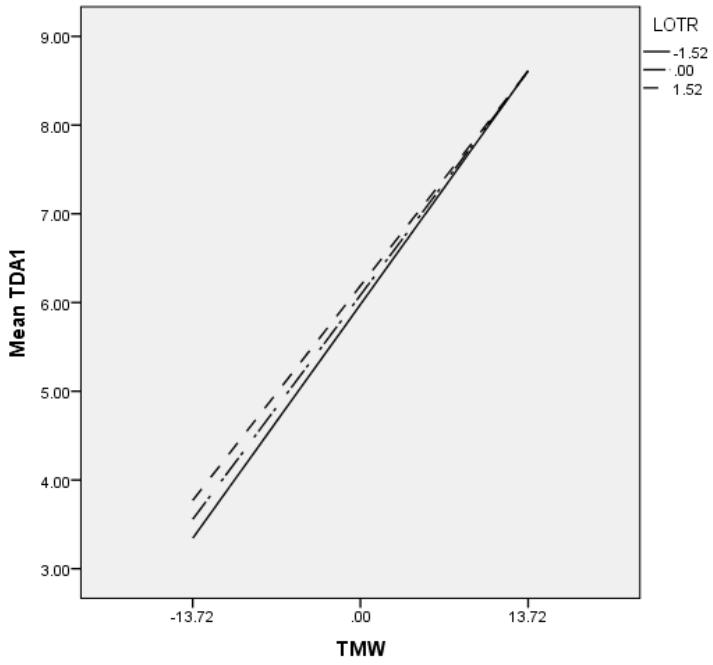
Table 5*Moderation Role of Optimism on the Relationship Between Mental Well-Being and Drug Adherence (N=300)*

Variable	β	*SE*	*t*	*P*	Δ R^2	ΔF	*95% Cl (LL-UP)*
Constant	*6.08*	*.07*	*82.40*	*.00*	*.01*	*2.01*	*[5.94,6.22]*
Mental well well-being (IV)	*.18*	*.02*	*32.10*	*.00*			*[.17,.10]*
Optimism (Moderator)	*.07*	*.05*	*1.43*	*.00*			*[-.02,.16]*
Mental wellbeing×Optimisim(IV×Modr)	*.10*	*.03*	*-1.42*	*.003*			*[-.03,.01]*
R= .92							

*Note N=300, *p<.05 **p<.01 ***p<.001*

Table 5 illustrated the moderating effect of optimism for mental well-being in predicting drug adherence. The main effect of mental well-being significantly predicts drug adherence (p<.001) and main effect of optimism is significant (p<.001) predictor of drug adherence. The coefficient of interaction of mental wellbeing and optimism is significant (β=.10 p, <.01 indicated a small, significant positive moderation effect, supported that optimism strengthen the relationship between mental Wellbeing and Drug adherence and found to explain 1% variance in drug adherence .

Figure 1 *Mod_Graph With Moderating Effect of Optimism between Mental -Wellbeing and Drug Adherence*



The mode graph (figure 1) shows moderating effect of optimism for mental well-being in predicting drug adherence. It can be seen that patients who have good mental wellbeing tend to have good drug adherence if they have higher level of optimism than patients with less level of optimism.

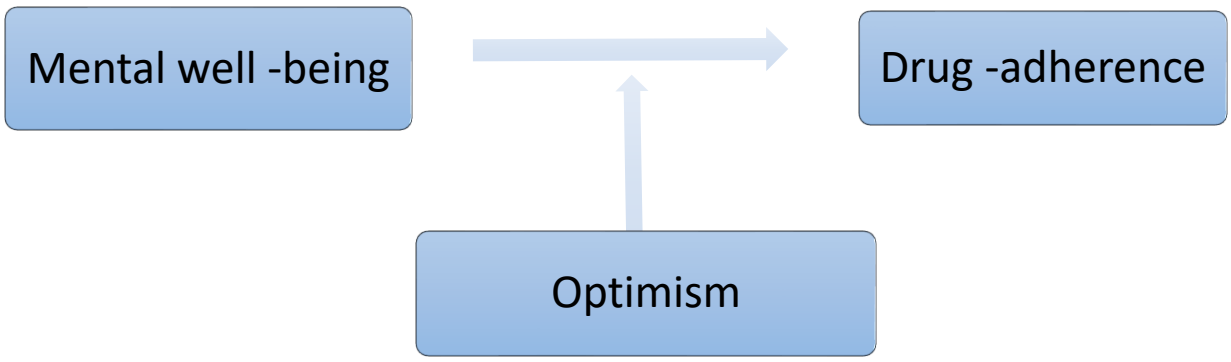


Figure 2 *Conceptual Moderation Model*

Table 6 *Mean Standared Deviation and t-test For Age Differences on Mental Well-Being,Drug Adherence and Optimisim (N═300)*

variable	Young adults		Middle adults		*t*	*p*	Cohen's d value
	M	SD	M	SD			
Mental well-being	46.90	13.80	47.60	13.72	-.39	.80	0.05
Optimisim	21.28	4.43	21.89	4.13	-1.06	.13	0.14
Drug Adherence	1.73	5.69	2.18	5.70	-.59	.95	0.08

Table 6 shows mean, standard deviation and t test values for mental wellbeing, optimism and drug adherence across age . The results in table 6 show that p values are non-significant ,indicating no meaningful differences between the age groups.

Table 7 *Mean Standared Deviation and t-test in Mental Well Being ,Drug Adherence And Life Orentation Test Across Gender (N═300)*

variable	Male		Female		*t*	*p*	Cohen's d value
	M	SD	M	SD			
Mental well-being	46.89	14.05	48.33	13.17	-1	.15	0.04
Optimisim	21.49	4.29	22.09	4.06	-1.18	.17	0.14
Drug Adherence	1.81	5.78	5.52	2.76	-1.02	.11	0.82

Table 7 shows mean, standard deviation and t values for mental wellbeing, optimism and drug adherence across gender. The results in the table 6 shows that p values are non-significant so there are no significant differences on Mental wellbeing ,optimism and drug adherence between males and females.

Table 8 *Mean Standard Deviation and t-test in Mental Well Being, Drug Adherence and Optimism Across Nature Of Disease (N═300)*

variable	Acute		Chronic		*t*	*p*	Cohen's d value
	M	SD	M	SD			
Mental well-being	44.58	14.45	50.03	12.50	-3.51	.00	0.40
Optimisim	21.01	4.50	22.37	3.83	-2.81	.00	0.32
Drug Adherence	1.07	6.11	2.99	5.11	-2.96	.00	0.34

Table 8 shows mean, standard deviation and t values for mental wellbeing, optimism and drug adherence across nature of disease. The result in the table shows that disease conditions (acute and chronic) had significant mean differences between two groups with p<.001.. The p-values are significant, indicating meaningful differences between acute and chronic diseases , patients with chronic diseases reported higher mental well-being, optimism, and drug adherence compared to those with acute diseases. Cohen 's d values show that effect size and the differences of mean values is large and significant.

Table 9 *Mean Standard Deviation And One Way Analysis of Variance in Mental well Being Drug Adherence and Life Orientation Test Across Type of Diseases (N═300)*

Variable	Diabetese Mellitus		Hypertention		Bronchitis		Diarhea		F(3,296)	*p*	η^2
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*			
Mental well being	*51.01*	*12.13*	*48.86*	*13.11*	*45.93*	*13.13*	*43.97*	*15.45*	*3.90***	.01	*.038*
Optimisim	*12.90*	*1.39*	*12.53*	*1.52*	*12.48*	*1.55*	*12.04*	*1.53*	*4.04***	.01	*.039*
Drug Adherence	*6.55*	*2.62*	*6.43*	*2.57*	*5.72*	*2.90*	*5.44*	*3.14*	*2.73**	.04	*.027*

Table 9 shows that the mean values of mental- wellbeing ,optimism and drug adherence for diabetes mellitus patients were significantly higher than other patients with diarrhea, bronchitis and hypertension's mean value of mental wellbeing for diabetes mellitus patients was 51.01 with *p*<.01.The mean value of optimism for diabetes mellitus patients was 12.90 higher than others with *p*<.01 and the mean value of drug adherence for diabetes mellitus patients was 6.55 higher than others with *p*<.05.The p-values are significant, indicating meaningful differences between type of diseases , patients with diabetes mellitus and hypertension reported significantly better mental well-being, optimism, and drug adherence compared to individuals with diarrhea and bronchitis.

Discussion

Drug adherence is crucial for achieving optimal health outcomes ,particularly for patients with chronic conditions which is a great concern in health care system in modern era.The present study aimed to investigate the predictive relashionship between mental well being and drug adherence among patients with acute and chronic diseases ,with a focus on the moderating role of optimisim and to examine the significant differences in mental well being ,optimism,and drug adherence based on demographic variables such as age,gender,nature of diseaes,type of diseases and type of disease. The warwick-Edinburgh mental well being scale (WEMWBS), Drug Attitude Inventory (DAI-10) and Life Orientation test (LOTR-R) were administered to assess mental well being,drug adherence and optimisim respectively.The alpha reliabilities were found out to be .98 , .79 and .46 of all three scales respectively. The reason of low reliability of life Orientation test may be attributed to response biases of the participants due to their cultural variations and indiuidual differences like cognitive abilities ,personolity traits and emotional state etc. The first hypotheses mental well-being and optimism will be positively correlated with drug adherence among patients with chronic and acute diseases was supported in the present study. The results have confirmed that mental well being and optimisim had significant and positive correlation with drug adherence.The second hypothesis mental well-being and optimism will positively predict drug adherence among patients with chronic and acute diseases. was also supported in the present study. The previous researches also showed the similar results as poor mental well being is often accompanied by less adherence to prescribed medication (Hajat & Stein,2018).There was a highly correlation between illness perception of severity personal control over adherence behaviour.(Mosleh & Almalik, 2016) Psychological factors affect

chronic diseases medication compliance as diabetese and hypertention related tovarious interacting mechanisims (Doyle et al., 2019). Patients who have better stronger social support are found to possess relatively better mental health and adhere frequently towards medications (Culig, 2018).Patients with a histroy of chronic anxiety disorders had significantly lowers rate of adherence to self managemnt practices in acute conditions (stanga al., 2019).As the third hypothesis optimisim will positively moderate the relationship between mental well being and drug adherence among patients with chronic and acute diseases was also supported in the present study . The results revealed a positive moderating effect of optimism ,indicating that higher levels of optimisim were associated with a stronger relashionship between mental well being and drug adherence. The previous researches supported our finding in repect of moderation effect in this study, as many studies underline the role of optimisim as moderator factor between mental well being and drug adherence suggestiong benificial impact on patient outcomes (Treaster, 2021). optimists may also be more inclined to view the recovery process in a positive light and follow through on medication instructions greater due to increased comittment (Lemay et al., 2018). Demographic variables have also been analysed as predictors.The results of this research was indicated that there were no significant differences between gender and age groups in mental wellbeing, optimism and drug adherence so hypotheses 4 and hypotheses 5 were not suppoted in this research..The demographic variable type of disease was significant and the result also showed that patients with diabetes mellitus reported significantly better mental well-being, optimism, and drug adherence compared to individuals with diarrhea so hypotheses 7 was supported. Similarly the demographic variable nature of diseses was also significat in present study and the result indicated that , individuals with chronic conditions report higher mental well-being, optimism, and drug adherence compared to those with acute conditions so hypotheses 6 was also supported in the study.The results also underscore the potential benifits of intervention aimed at enhancing mental well being and promoting drug adherence among patients with chronic and acute illnesses.The study findings have implications for health care providers and polycymakers seeking to improve drug adherence and health outcomes among patients with chronic and acute dissaeses on national and international level.

Conclusion

Based on the findings of the study, following conclusions were made:

The present study examined the correlation and predictive relationship between mental well-being and drug adherence among patients in both acute and chronic conditions, with a particular focus on the moderating role of optimism. Additionally, the study was sought to explore significant differences in mental well-being, optimism, and drug adherence across demographic variables, such as age ,gender nature of disease, and type of diseaeses. Results indicated a significant and positive correlation among optimisim , mental well-being and drug adherence and also found that mental wellbeing positively predict drug adherence. The moderation effect which was proposed that optimism would positively moderate the relationship between mental well-being and drug adherence, was also supported. The results revealed a significant positive moderation effect, indicating that higher levels of optimism were associated with a stronger relationship between mental well-being and drug adherence. Further research is needed to better understand the inherent mechanisms and casual effect for this occured outcome. In terms of demographic and disease-related factors, significant differences were found in mental well-being, optimism, and drug adherence between patients with acute and chronic diseases. Patients with chronic diseases reported significantly better mental well-being, higher optimism, and greater drug adherence compared to those with acute diseases. Additionally, patients with diabetes mellitus exhibited better outcomes across all three variables compared to those with bronchitis and diarrhea. Finally, no significant differences were found in mental well-being, optimism, or drug adherence across gender ,age and , confirmed that these variables did not significantly affect the relationships examined in this study. The findings of this study have significant implications for healthcare providers, policymakers, and researchers. Policymakers can develop public health initiatives to promote mental wel-being among patient with chronic diseases, Finally improving drug

adherence and health outcomes. Healthcare providers should consider individual differences in mental wellbeing when developing treatment plans to promote optimal drug adherence. Researcher can also use these findings for upcoming future research on the same variables.

References

Ahmed, M. (2021). Chronic cardiac diseases and patients' mental health: Exploring the impact of improving mental health on chronic heart failure prognosis and adherence to treatment behaviour in primary care based patients.https://wlv.openrepository.com/handle/2436/624529

Alosaimi, K., Alwafi, H., Alhindi, Y., Falemban, A., Alshanberi, A., Ayoub, N., & Alsanosi, S. (2022). Drug adherence among Patients with Chronic Diseases in Saudi Arabia. *International Journal of Environmental Research and Public Health/International Journal of Environmental Research and Public Health, 19*(16), 10053. https://doi.org/10.3390/ijerph191610053

Alswedani, S., Mehmood, R., Katib, I., &Altowaijri, S. M. (2023). Psychological Health and Drugs: Data-Driven Discovery of Causes, Treatments, effects, and abuses. *Toxics, 11*(3), 287. https://doi.org/10.3390/toxics11030287.

Amonoo, H. L., Celano, C. M., Sadlonova, M., & Huffman, J. C. (2021). Is optimism a protective factor for cardiovascular disease? *Current Cardiology Reports, 23*, 1-7. https://doi.org/10.1007/s11886-021-01590-4

Bąk-Sosnowska, M., Gruszczyńska, M., Wyszomirska, J., & Daniel-Sielańczyk, A. (2022). *The Influence of Selected Psychological Factors on Drug adherence in Patients with Chronic Diseases. Healthcare, 10*(3), 426. https://doi.org/10.3390/healthcare10030426

Bashir, A. B., & Ondigo, H. O. (2018). Effect of Financial Products on Financial Performance of Small and Medium Enterprises in Nairobi County. *Journal of International Business, Innovation and Strategic Management, 2*(2), 1-36.https://jibism.org/core_files/index.php/JIBISM/article/view/jibism

Berghoff, C. R., Gratz, K. L., Portz, K. J., Pinkston, M., Naifeh, J. A., Evans, S. D., . . . Tull, M. T. (2018). The role of emotional avoidance, the patient–provider relationship, and other social support in ART adherence for HIV+ individuals. *AIDS and Behavior, 22*, 929-938. https://doi.org/10.1007/s10461-017-1745-2

Black, R., Fontaine, O., Lamberti, L., Bhan, M., Huicho, L., Arifeen, S. E., Masanja, H., Walker, C. F., Mengestu, T. K., Pearson, L., Young, M., Orobaton, N., Chu, Y., Jackson, B., Bateman, M., Walker, N., & Merson, M. (2019). Drivers of the reduction in childhood diarrhea mortality 1980-2015 and interventions to eliminate preventable diarrhea deaths by 2030. *Journal of Global Health, 9*(2). https://doi.org/10.7189/jogh.09.020801.

Bot M, Middeldorp CM, de Geus EJC, et al. Validity of LIDAS (LIfetime Depression Assessment Self-report): a self-report online assessment of lifetime major depressive disorder. *Psychological Medicine. 2017;47*(2):279-289. doi:10.1017/S0033291716002312

Brite, J., Friedman, S., De La Hoz, R. E., Reibman, J., & Cone, J. (2019). Mental health, long-term drug adherence, and the control of asthma symptoms among persons exposed to the WTC 9/11 disaster.*The Journal of Asthma/Journal of Asthma*, *57*(11), 1253–1262. https://doi.org/10.1080/02770903.2019.1672722

Cassidy, T. (2022). *Stress, cognition and health*. https://doi.org/10.4324/9781003098737.

Cassidy, T. (2022). *Stress, cognition and health: Real world examples and practical applications*: Routledge.https://doi.org/10.4324/9781003098737

Chan, S. F., & La Greca, A. M. (2020). Perceived stress scale (PSS). In *Encyclopedia of behavioral medicine* (pp. 1646-1648): Springer.https://doi.org/10.1007/978-3-030-39903-0_773

Choudhry, N. K., Kronish, I. M., Vongpatanasin, W., Ferdinand, K. C., Pavlik, V. N., Egan, B. M., Schoenthaler, A., Miller, N. H., & Hyman, D. J. (2022). Drug adherence and blood pressure control: a scientific statement from the American Heart Association. *Hypertension*, *79*(Majid). https://doi.org/10.1161/hyp.0000000000000203.

Cookson, W. O. C. M., Cox, M. J., & Moffatt, M. F. (2017). New opportunities for managing acute and chronic lung infections. *Nature Reviews. Microbiology*, *16*(2), 111–120. https://doi.org/10.1038/nrmicro.2017.122.

Culig, J. (2018). Patients' adherence to prescribed medication. *Journal of Applied Health Sciences*, *4*(Majid), 7–14. https://doi.org/10.24141/1/4/1/1.

Dhingra, S., Rahman, N. a. A., Peile, E., Rahman, M., Sartelli, M., Hassali, M. A., Islam, T., Islam, S., & Haque, M. (2020). Microbial Resistance Movements: An overview of global public health threats posed by antimicrobial resistance, and how best to counter. *Frontiers in Public Health*, *8*. https://doi.org/10.3389/fpubh.2020.535668.

Doyle, S. K., Chang, A. M., Levy, P., & Rising, K. L. (2019). Achieving health equity in hypertension management through addressing the social determinants of health. *Current Hypertension Reports*, *21*(8). https://doi.org/10.1007/s11906-019-0962-7.

DuPont, H. L. (2016). Persistent diarrhea: a clinical review. *Jama, 315*(24), 2712-2723. doi:10.1001/jama.2016.7833

Gandolfi, M., Donisi, V., Battista, S., Picelli, A., Valè, N., Del Piccolo, L., & Smania, N. (2021). Health-related quality of life and psychological features in post-stroke patients with chronic pain: a cross-sectional study in the neuro-rehabilitation context of care. *International Journal of EnvironmentalResearch and Public Health, 18*(6), 3089.https://doi.org/10.3390/ijerph18063089

Gureje, O., Nortje, G., Makanjuola, V., Oladeji, B. D., Seedat, S., & Jenkins, R. (2015). The role of global traditional and complementary systems of medicine in the treatment of mental health disorders. *The Lancet Psychiatry, 2*(2), 168-177. https://doi.org/10.1016/S2215-0366(15)00013-9

Hajat, C., & Stein, E. (2018). The global burden of multiple chronic conditions: A narrative review. *Preventive Medicine Reports*, *12*, 284–293. https://doi.org/10.1016/j.pmedr.2018.10.008.

Hayes, A. F., & Rockwood, N. J. (2017). Regression-based statistical mediation and moderation analysis in clinical research: Observations, recommendations, and implementation. *Behaviour Research and Therapy, 98*, 39-57. https://doi.org/10.1016/j.brat.2016.11.001

Hayes, C. E. (2016). *Factors associated with differences in adherence in smokers and nonsmokers with asthma and chronic obstructive pulmonary disease.* Louisiana State University Health Sciences Center. https://search.proquest.com/openview/aedc7d6b22498c958e0a8845bcf23b15/1?pq-origsite=gscholar&cbl=18750

Hernández-Torrano, D., Ibrayeva, L., Sparks, J., Lim, N., Clementi, A., Almukhambetova, A. Muratkyzy, A. (2020). Mental health and well-being of university students: A bibliometric mapping of the literature. *Frontiers in psychology, 11*, 1226.https://doi.org/10.3389/fpsyg.2020.01226

Huang, Y.-M., Shiyanbola, O. O., & Smith, P. D. (2018). Association of health literacy and medication self-efficacy with drug adherence and diabetes control. *Patient preference and adherence*, 793-802. https://doi.org/10.2147/ppa.s153312

Kiprop, J. C. (2020). Malnutrition: Current challenges and future perspectives. https://doi.org/10.5772/intechopen.92007.

Kiprop, J. C. (2020). Malnutrition: Current challenges and future perspectives.

Kızılırmak, D., &Yorgancıoğlu, A. (2023). Acute and chronic bronchitis. In *Springer eBooks* (pp. 1–8). https://doi.org/10.1007/978-3-031-22483-6_36-1.

Kring, A. M., & Johnson, S. L. (2022). *Abnormal psychology: The science and treatment of psychological disorders*: John Wiley & Sons.https://books.google.com/books?hl=en&lr=&id=mi7WEAAAQBAJ&oi=fnd&pg=PR7&dq=Kring,+A.+M.,+%26+Johnson,+S.+L.+(2022).+Abnormal+psychology:+The+science+and+treatment+of+psychological+disorders:+John+Wiley+%26+Sons.&ots=9Q8endnkuW&sig=FY31T45cI5JPHvVKm4Ltfoc9BBI

Lemay, J., Waheedi, M., Al-Sharqawi, S., & Bayoud, T. (2018). Drug adherence in chronic illness: do beliefs about medications play a role? *Patient preference and adherence*, 1687-1698. https://doi.org/10.2147/ppa.s169236

Majid, M. (2020). Renewable energy for sustainable development in India: current status, future prospects, challenges, employment, and investment opportunities. *Energy, Sustainability and Society, 10*(1), 1-36. https://doi.org/10.1186/s13705-019-0232-1

Makai, M., & Baiee, H. (2022). Drug adherence in hypertensive diabetic patients. *Medical Journal of Babylon/Mağallaẗ Bābil Al-ṭibbiyyaẗ, 19*(4), 569. https://doi.org/10.4103/mjbl.mjbl_129_22

Meena, K. P. (2018). Research Papers. *Journal of Family Medicine and Primary Care*, *7*(Suppl3),S1S26.https://journals.lww.com/jfmpc/fulltext/2018/07003/research_papers.18.aspx

Millstein, R. A., Celano, C. M., Beale, E. E., Beach, S. R., Suarez, L., Belcher, A. M., Januzzi, J. L., & Huffman, J. C. (2016). The effects of optimism and gratitude on adherence, functioning and mental health following an acute coronary syndrome.*General Hospital Psychiatry,43*,17–22. https://doi.org/10.1016/j.genhosppsych.2016.08.006

Mosleh, S. M., & Almalik, M. M. (2016). Illness perception and adherence to healthy behaviour in Jordanian coronary heart disease patients. *European Journal of Cardiovascular Nursing, 15*(4), 223-230. https://doi.org/10.1177/1474515114563885

Peill, J. M., Trinci, K. E., Kettner, H., Mertens, L. J., Roseman, L., Timmermann, C. & Carhart-Harris, R. L. (2022). Validation of the Psychological Insight Scale: A new scale to assess psychological insight following a psychedelic experience. *Journal of Psychopharmacology*, *36*(1), 31-45.https://doi.org/10.1177/02698811211066709

Salazar, L. J., Srinivasan, K., Heylen, E., & Ekstrand, M. L. (2023). Drug adherence among Primary Care Patients with Common Mental Disorders and Chronic Medical Conditions in Rural India. *Indian Journal of Psychological Medicine, 45*(6), 622–628. https://doi.org/10.1177/02537176231173869

Schutte, A. E., Venkateshmurthy, N. S., Mohan, S., & Prabhakaran, D. (2021). Hypertension in Low- and Middle-Income countries. *Circulation Research*, *128*(Majid), 808–826. https://doi.org/10.1161/circresaha.120.318729.

Senbekov, M., Saliev, T., Bukeyeva, Z., Almabayeva, A., Zhanaliyeva, M., Aitenova, N., Toishibekov, Y., &Fakhradiyev, I. (2020). The Recent Progress and Applications of Digital Technologies in Healthcare: A review. *International Journal of Telemedicine and Applications*, *2020*, 1–18. https://doi.org/10.1155/2020/8830200.

Shafiq, N., Pandey, A. K., Malhotra, S., Holmes, A., Mendelson, M., Malpani, R., Balasegaram, M., & Charani, E. (2021). Shortage of essential antimicrobials: a major challenge to global health security. *BMJ Global Health*, *6*(11), e006961. https://doi.org/10.1136/bmjgh-2021-006961.

Stanga, V., Turrina, C., Valsecchi, P., Sacchetti, E., & Vita, A. (2019). Well-being in patients with schizophrenia, mood and personality disorders attending psychiatric services in the community. A controlled study. *Comprehensive Psychiatry*, *91*, 1–5. https://doi.org/10.1016/j.comppsych.2019.02.001.

Stellar, J. E., John-Henderson, N., Anderson, C. L., Gordon, A. M., McNeil, G. D., & Keltner, D. (2015). Positive affect and markers of inflammation: discrete positive emotions predict lower levels of inflammatory cytokines. *Emotion, 15*(2), 129. https://psycnet.apa.org/journals/emo/15/2/129.html?uid=2015-01796-001

Tenney, E. R., Logg, J. M., & Moore, D. A. (2015). (Too) optimistic about optimism: The belief that optimism improves performance. *Journal of personality and social psychology, 108*(3), 377. https://psycnet.apa.org/record/2015-09924-001

Treaster, M. K. (2021). *Optimism and Physical Health-Related Quality of Life in Chronic Illness: Mediating Effects of Control Beliefs and Health Behaviors.* East Tennessee StateUniversity.https://search.proquest.com/openview/c0269eb83093019ef9e54ed536f51a43/1?pq-origsite=gscholar&cbl=18750&diss=y