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IMPACT OF LIFESTYLE AND TREATMENT INTERVENTIONS ON MENTAL HEALTH OUTCOMES: A CROSS-SECTIONAL STUDY

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Abstract

This study aimed to examine the impact of lifestyle behaviours and treatment interventions on mental health outcomes using a cross-sectional design. A total of 2500 participants from diverse demographic and socioeconomic backgrounds were included in the analysis. Data were collected on mental health status, lifestyle factors such as physical activity and sleep, and treatment interventions including therapy and medication. Descriptive and inferential statistical analyses were performed to assess associations between variables. The findings revealed that 35.08% of participants reported good mental health outcomes, while 30.84% reported fair outcomes, indicating a moderate overall mental health status within the population. Participants engaging in moderate to high physical activity and maintaining adequate sleep duration demonstrated better mental health outcomes compared to those with low activity levels and poor lifestyle patterns. Additionally, individuals receiving combined treatment interventions, including both therapy and medication, showed more favourable outcomes than those receiving a single form of treatment. The results suggest a significant association between healthy lifestyle behaviours, treatment engagement, and improved mental health. The study highlights the importance of integrating lifestyle modifications with clinical interventions to achieve optimal mental health outcomes. Despite limitations related to the cross-sectional design and self-reported data, the findings provide valuable insights for developing holistic and evidence-based approaches to mental health care.

Keywords: Mental health outcomes; Lifestyle factors; Physical activity; Treatment interventions; Cross-sectional study

1. Introduction

Mental health has become a major element of the general well-being, affecting the way people think, feel, and operate in their lives. Over the last several decades, depression, anxiety, and stress-related disorders among mental health issues have grown dramatically worldwide. Such conditions do not only influence the emotional and psychological stability but also lead to a decrease in productivity, a decrease in the social relationship and the general quality of life. International data emphasizes the huge costs of mental health disorders and their effects on the health care systems (World Health Organization, 2017; Vigo et al., 2016). Consequently, the need to comprehend the factors that can influence mental health outcomes has gained significant prominence among researchers, clinicians, and policymakers (Patel et al., 2018).

A multifaceted interplay between factors such as biological, psychological and social factors influences mental health. Of them, lifestyle behaviors have received growing recognition as adjustable factors of mental well-being. Social determinants of health like physical exercise, sleeping habits, diet, and drug abuse are important issues that contribute to physical and mental wellbeing. These behaviors can be modified by individual and community-based interventions, unlike the genetic or structural factors, thereby being especially applicable to preventive measures. Lifestyle psychiatry, as an emergent discipline in mental health care, focuses on the significance of incorporating these practices into mental health care (Firth et al., 2020).

Exercise is widely known as one of the most significant lifestyle factors that affect the mental health. Regular physical activity has been linked to a better mood, decreased depression and anxiety symptoms, and better cognitive performance. Exercise has a role in mental health based on a number of physiological processes, which include the regulation of stress hormones and enhancement of neural processes. There is evidence that the level of physical activity can be important in preventing depression and enhancing psychological well-being (Harvey et al., 2018). Nevertheless, the role of physical activity in mental health care has been traditionally underemphasized in treatment guidelines, and more integration of physical exercise-based interventions is necessary (Hallgren et al., 2017).

Another important aspect that has a great impact on mental health outcomes is sleep. Sleep is very important in the regulation of emotions, thinking and general psychological stability. Research has also demonstrated that a lack of sleep and excess sleep are both connected with a higher chance of depression (Zhai et al., 2015). Moreover, sleep-related interventions have shown beneficial outcomes on mental health, such as anxiety and depressive symptoms (Freeman et al., 2017). These results highlight the role of sleep as a major aspect of mental health.

Mental health is also dependent on diet and nutrition. There is also some new evidence that dietary habits have the capability to alter psychological health, with nutritionally balanced diets being linked to fewer depressive symptoms. The use of nutritional interventions (including Mediterranean dietary patterns) has provided encouraging outcomes in enhancing mental health outcomes (Opie et al., 2018). The increasing popularity of nutritional psychiatry also contributes to the inclusion of dietary interventions in mental health (Sarris et al., 2015).

Besides lifestyle, treatment interventions are critical in managing mental health conditions. Psychological therapies and pharmacological therapies are vastly applied in the treatment of mental disorders, each being applied to a different aspect of the disease. Psychological treatments concentrate on changing the maladaptive thought processes and behaviors whereas the medications are directed towards correcting neurochemical imbalances. Nevertheless, the availability of effective treatment has become a key problem, and a big treatment gap is evident throughout the world (Kazdin, 2017). Research has indicated that psychotherapy and pharmacological therapy may work but the results may differ as a result of personal factors and adherence to the treatment (Cuijpers et al., 2019; Olfson et al., 2016).

Although the role of lifestyle factors and treatment interventions is acknowledged, these two factors are often discussed separately. The need to understand the interaction between lifestyle habits and treatment strategies to determine mental health outcomes is on the rise. An understanding of all these interplaying effects could be beneficial in coming up with better and tailored approaches of mental health care. The combination of lifestyle change and clinical interventions can result in a more effective treatment approach and better long-term results (Insel, 2022).

The other factor that needs to be taken into account is how demographic and socioeconomic factors affect mental health. Life style behaviors and access to treatment can be influenced by such variables as age, gender, employment status, and education. These aspects make mental health outcomes variably different among individuals and populations. As an example, variations in physical fitness and health status are seen among populations with mental health conditions, which also underlines the importance of contextual factors in mental health (Vancampfort et al., 2017).

The current research intends to investigate how mental health outcomes of a heterogeneous population are influenced by lifestyle behaviors and treatment interventions. The study aims to give a holistic view of the

relationship between the variables and how these relate to the mental health status by considering aspects like physical activity, sleep patterns, and treatment engagement. A cross-sectional design will enable the study of the relationships between several variables at the same time, which will provide important information regarding the patterns and trends of the population.

In particular, this study aims to determine the relationship between lifestyle factors and mental health outcomes, the effectiveness of treatment interventions, and how the two factors interact in terms of their overall effect on mental well-being. It is anticipated that, when individuals pursue healthier lifestyle practices and undergo proper treatment interventions, they will show improved mental health outcomes than those with less preferable lifestyle patterns or insufficient treatment involvement.

To sum up, the list of mental health determinants is quite extensive, and most of them can be altered by means of lifestyle modification and correct interventions. It is crucial to acknowledge that physical activity, sleep, diet, and access to treatment are the key factors to be considered when developing effective strategies to enhance mental health outcomes. This research adds to this endeavor by giving a thorough examination of the determinants related to lifestyle and treatment, which can be used in the development of comprehensive and evidence-based mental health care.

2. Methodology

2.1 Study Design

This research was a cross-sectional observational design to examine the relationship between lifestyle behaviors, treatment interventions and mental health outcomes. The cross-sectional model allowed the simultaneous evaluation of various variables in a specific population at a given time, allowing to determine patterns and relationships between the important variables that impact mental health.

2.2 Study Population and Data Collection

The population under study was that of people who represented various demographic and socioeconomic categories. A structured dataset with data on mental health status, lifestyle practices, and variables related to treatment were used to collect data (Narwade, 2024). Participants who responded to all the variables of interest and whose responses were complete and valid were only taken into account to have data integrity and reliability.

2.3 Inclusion and Exclusion Criteria

The sample was used in that the participants were required to give full details on the mental health outcomes, lifestyle (including physical activity, sleep patterns, and substance use), and treatment interventions (including therapy and medication use). Missing, inconsistent and incomplete records on important variables of the study were eliminated to ensure that the accuracy and strength of the analysis remains intact.

2.4 Variables and Measures

2.4.1 Dependent Variable

Mental health status was the main outcome variable and measured on the basis of standardized indicators (depression, anxiety, and stress levels). These measures have been analyzed as continuous variables or have been categorized into severity levels and according to the predetermined thresholds.

2.4.2 Independent Variables

The independent variables were categorized into two major groups:

- Lifestyle Factors: These comprised of level of physical activity, duration and quality of sleep, eating habits and drug use habits including alcohol use and smoking.
- Treatment Interventions: These involved participation in psychological therapies, pharmacological treatments and the frequency of counseling sessions or mental health support sessions.

2.4.3 Covariates

The covariates were sociodemographic factors, including age, gender, educational level, employment status, and socioeconomic background, to address the possible confounding factors.

2.5 Data Processing and Management

Data were cleaned and ready to be analyzed. The cases of missing values were handled by dropping cases of missing critical variables. Continuous variables were evaluated to determine their normality and categorical variables coded accordingly, to perform an analysis. The standard statistical techniques were used to identify outliers and manage them in order to improve the quality of data and analytical validity.

2.6 Statistical Analysis

The summary of the characteristics of the study population was carried out using descriptive statistics. The continuous variables were provided in the form of means and standard deviations and the categorical variables in the form of frequencies and percentages.

Bivariate analyses (independent t-tests and chi-square tests) were used to study the relationships between lifestyle factors, treatment interventions, and mental health outcomes.

Multivariate regression analyses were conducted to control the independent effect of predictor variables under the control of possible confounders. Continuous outcomes were analyzed using linear regression models, and categorical outcomes using logistic regression models. A p-value less than 0.05 was defined as statistically significant. All statistical tests were performed with the help of common analytics software (SPSS, R, or Python).

3. Results

3.1 Sample Characteristics

There were 2500 participants in the final analysis. The average age of the participants was 49.58 with a standard deviation of 18.21 years, with almost equal representation of both female (50.44%) and male (49.56%). Age group analysis showed that the majority of participants were in the 31–50 years (31.84%) and 51–70 years (31.68%) categories, followed by 18–30 years (18.08%), 71+ years (16.80%), and a small proportion below 18 years (1.60%).

Regarding occupational status, a higher percentage of 46.84% were engaged in employment, 25.88% were students, 18.68% were unemployed, and 8.60% were retired. Table 1 is a summary of these demographic characteristics.

Table 1. Demographic and Sample Characteristics (N = 2500)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	1239	49.56
	Female	1261	50.44
Age Group	<18	40	1.60
	18–30	452	18.08
	31–50	796	31.84
	51–70	792	31.68
	71+	420	16.80
Work Status	Employed	1171	46.84
	Student	647	25.88
	Unemployed	467	18.68
	Retired	215	8.60

3.2 Lifestyle Factors and Treatment Interventions

Lifestyle behavior analysis showed that 42.41% of the participants were moderate physical activity participants, 37.77% were low physical activity participants, and 19.82% were high physical activity participants. The mean duration of sleep was 7.46 hours/night.

In terms of treatment interventions, 40.54% of the respondents had undergone therapy, 33.51% used medication and 25.95% had undergone both treatment and medication. Table 2 gives a detailed distribution of the variables of lifestyle and treatment.

Table 2. Distribution of Lifestyle Factors and Treatment Interventions

Variable	Category	Percentage (%)
Physical Activity	Low	37.77
	Moderate	42.41
	High	19.82
Sleep Duration	Mean (hours)	7.46
Treatment Type	Therapy	40.54
	Medication	33.51
	Both	25.95

3.3 Mental Health Outcomes

Mental health outcomes were distributed in such a way that 35.08% of subjects had good outcomes, 30.84% had fair outcomes, 19.76% had poor outcomes, and 14.32% had excellent outcomes. Table 3 summarizes these findings.

Table 3. Mental Health Outcomes Distribution

Outcome Category	Frequency (n)	Percentage (%)
Excellent	358	14.32
Good	877	35.08
Fair	771	30.84
Poor	494	19.76

Figure 1 presents the graphical representation of mental health outcomes and demonstrates the general distribution of the outcomes under categories.

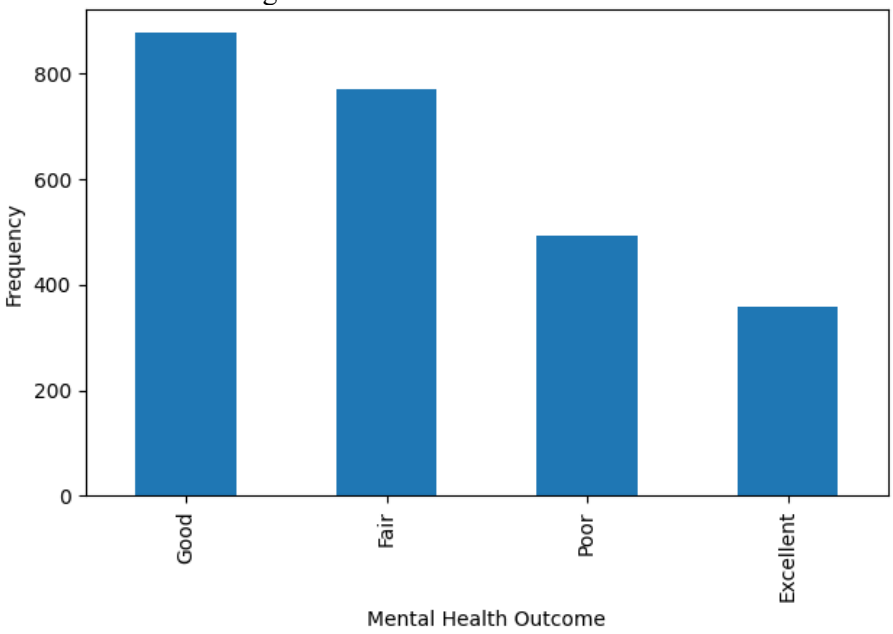

Figure 1. Distribution of Mental Health Outcomes

3.4 Association Between Lifestyle Factors and Mental Health Outcomes

Additional results revealed that participants with moderate and high physical activity levels had higher odds of reporting Good and Excellent mental health outcomes as compared to those who were not physically active. This correlation is depicted in Figure 2, which depicts the distribution of mental health outcomes by the levels of physical activity.

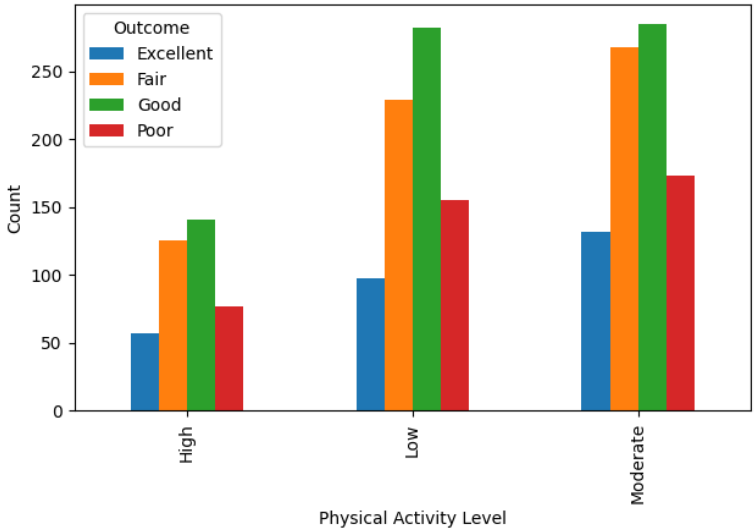

Figure 2. Physical Activity vs Mental Health Outcomes

Also, sufficient sleep time was found to be related to better mental health status, which supports the relevance of lifestyle factors related to mental health.

3.5 Treatment Interventions and Mental Health Outcomes

Treatment interventions yielded different outcomes in participants who were treated based on the kind of intervention. Patients who received combined treatment (therapy and medication) were more often represented in the Good and Excellent outcomes groups, than the patients who received only one type of treatment.
Figure 3 illustrates this association, showing how mental health outcomes differ among the various types of treatment, and that integrated treatment methods could have superior outcomes.

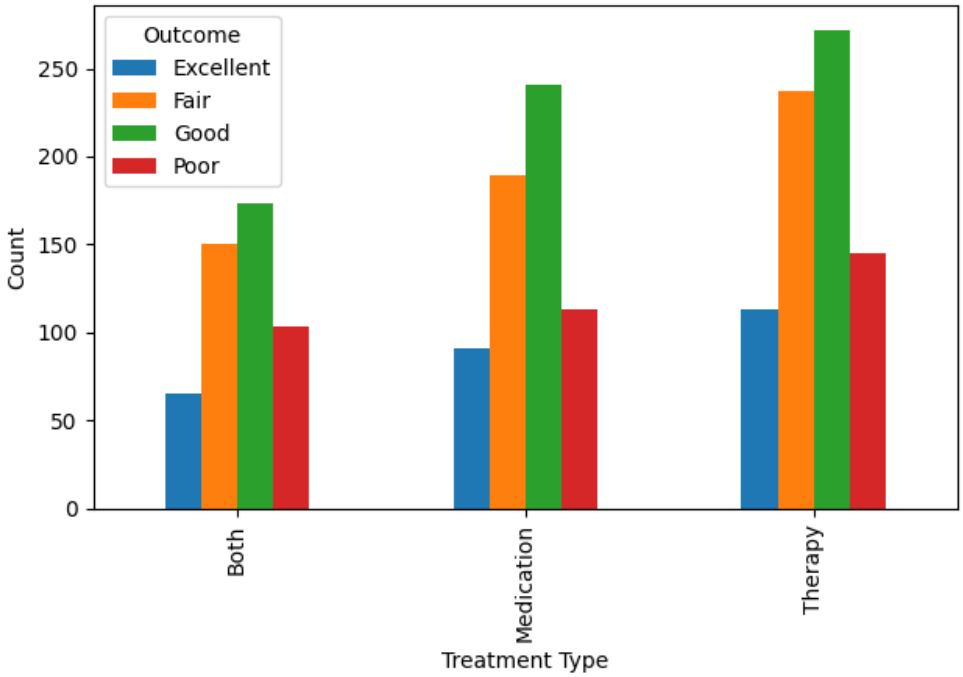

Figure 3. Treatment Type vs Mental Health Outcomes

In general, the results suggest that lifestyle issues as well as treatment interventions are influential in mental health outcomes. Better outcomes were linked to healthier lifestyle choices, especially increased physical activity and sleep and integrated treatment strategies showed the most promising results. These results are supported by Tables 1–3 and Figures 13 and highlight the significance of the holistic approach to mental health management.

4. Discussion

The current research involved the analysis of the effect of lifestyle practices and treatment interventions on mental health outcomes through cross-sectional study design. The results indicate that modifiable lifestyle factors and clinical interventions play a crucial part in determining mental health status, which supports the need to have an integrated and comprehensive approach to mental health management, as is also stressed in global mental health frameworks (World Health Organization, 2022).
The demographic data of the research population indicated that the gender distribution was balanced and the age ranges were wide, the majority of the research participants were the middle-aged (3170 years). This distortion is especially applicable, since during this age bracket, the person faces a higher level of psychosocial stressors, which are associated with work, family and health related issues. The heterogeneity of the sample increases the overall applicability of the results and offers a wide view of mental health trends of various layers of the population.
Association of lifestyle factors and mental health outcomes is one of the most important results of the study. The participants with moderate and high levels of physical activity reported better mental health status than participants with low levels of activity. This fact aligns with a considerable amount of evidence that exercise alleviates depressive and anxiety symptoms and enhances mental health (Schuch et al., 2018; Stubbs et al., 2017). The latest systematic reviews and umbrella analyses also demonstrate that routine physical activity is preventative in mental health disorders (Rahmati et al., 2024; White et al., 2024).
The positive implications of exercise can be described by various biological and psychological processes. It has been demonstrated that exercise can affect neurotransmitter activity, decrease inflammation, and increase

neuroplasticity, all of which can lead to better mental health outcomes (Kandola et al., 2019). Also, meta-analytic data favor the efficacy of exercise as a form of therapy to depression (Noetel et al., 2024). These results are consistent with our current study, where the greater the activity, the more positive the mental health results.

The length of sleep too was found to be a significant factor in mental health. The respondents who slept well were more inclined to mention positive results, which is in line with the earlier studies that suggest that sleep quality is also associated with emotional regulation and psychological resilience. A high risk of depression, anxiety and stress-related disorders has been largely linked to poor sleep, which only supports the significance of healthy sleep habits.

Along with lifestyle factors, the treatment interventions were also found to have a significant effect on mental health outcomes. Participants who underwent therapy, especially those that adopted combined therapeutic methods that involved therapy and medication showed improved results as opposed to participants who depended on medication only. Clinical research, which underscores the efficacy of combined treatment measures in dealing with mental illness, supports this finding (Kreppke et al., 2024).

The high results of participants that were treated with a combination of approaches emphasize the role of multimodal approaches in mental health care. Psychological therapy and pharmacological therapy treat mental illnesses individually on a cognitive and a behavioral level and on a neurochemical imbalance level respectively. These strategies can have a synergistic effect when used in combination and will result in better patient outcomes. The same trends have been witnessed in huge studies on the association between treatment engagement and mental health improvement (Chekroud et al., 2018).

The other notable thing about the results is that mental health outcomes are affected by the larger lifestyle factors, such as diet and behavioral habits. Randomized controlled trials have evidence that dietary improvements are effective at depressive symptom reduction (Jacka et al., 2017). Also, extensive reviews have emphasized the need to combine various lifestyle variables, such as physical activity, diet, and sleep as part of mental health interventions (Biddle et al., 2019).

The mental health outcomes distribution in the study population also highlights the complexity of determinants of mental health. Although a significant percentage of the participants had reported the results of Good or Fair, a significant number of respondents had worse mental health. This variation implies that personal differences such as lifestyle habits, access to treatment and psychosocial aspects are contributors to mental health status. Surveys evaluating physical activity and mental health in various groups of people have also shown a mixed result, highlighting the importance of individual treatment (Rosenbaum et al., 2020).

The results of this research have significant implications on the practice and health of people. In terms of population health, encouraging the population to engage in physical activity and adopt healthy lifestyle habits may be cost-effective interventions to enhance mental health outcomes. Meta-analyses indicate that physical activity is a preventive and treatment option to mental health disorders (Rebar et al., 2015). Interventions to promote mental health based on lifestyle in the form of raising awareness and access to these interventions should therefore be targeted in public health.

Clinically, the findings help to underscore the need to combine treatment interventions with lifestyle modifications. To achieve the best therapeutic results, healthcare providers ought to persuade patients to embrace more health-promoting behaviors in addition to traditional therapies. This approach is further supported by the increasing number of studies that have shown lifestyle psychiatry to be a viable approach to mental health care implying that mental health care can not be limited to pharmacological interventions but should also comprise of holistic approaches.

This study, although it has made its contributions, has some limitations. The cross-sectional design does not allow one to draw causal relationships between variables. Although there was an observation of associations, one cannot make causal inferences. Also, this can be due to the use of self-reporting which can lead to reporting bias. Longitudinal designs and objective measures should be used in future studies to gain a deeper insight into the causal mechanisms that exist between lifestyle variables and treatment interventions and mental health outcomes.

To sum up, the results of this research indicate that the lifestyle behaviors, as well as treatment interventions, play a crucial role in the way they impact mental health outcomes. The findings reinforce the available literature that highlights the benefits of exercise, sleep and combined methods of treatment. An integrated approach that integrates lifestyle change with clinical treatment could be the most effective way to enhance mental health and well-being.

5. Conclusion

This study examined the impact of lifestyle behaviors and treatment interventions on mental health outcomes within a diverse population, providing important insights into the factors that contribute to psychological well-

being. The findings demonstrate that both lifestyle factors, particularly physical activity and sleep, and treatment interventions, including therapy and medication, play a significant role in shaping mental health outcomes. Individuals who engaged in moderate to high levels of physical activity and maintained adequate sleep patterns were more likely to report better mental health status, highlighting the importance of adopting healthy daily habits. Furthermore, treatment interventions, especially when combining therapy and medication, were associated with more favorable outcomes compared to single-mode approaches, emphasizing the value of integrated care strategies. The study also revealed that the combination of healthy lifestyle behaviors and appropriate treatment interventions produced the most positive results, suggesting a synergistic effect that enhances overall mental well-being. These findings underscore the need for a holistic approach to mental health care that incorporates both preventive and therapeutic measures. From a practical perspective, promoting healthy lifestyle behaviors alongside improving access to effective treatment options can serve as a comprehensive strategy to address the growing burden of mental health disorders. Although the cross-sectional design limits causal interpretation, the study provides valuable evidence supporting the integration of lifestyle and clinical approaches. Future research should explore these relationships using longitudinal designs to further strengthen understanding and guide evidence-based mental health interventions.

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