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Investigating the Impact of Physical Activities and Sleep Quality on Mental Health among Young Adults in Gujranwala

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Abstract
This study investigates how lifestyle choices, the "silent engines" of our well-being, impact the mental health of young adults. By examining 50 participants, the research reveals that while we often treat our bodies like machines, our daily rest is actually the primary driver of emotional resilience. The findings highlight that sleep quality is a significant positive predictor of psychological well-being, whereas physical activity, though a vital component of a healthy lifestyle, did not show a significant predictive link in this specific model. Ultimately, the data suggests that enhancing sleep hygiene is a potent, modifiable strategy for fostering mental strength and reducing the global burden of anxiety and depression.
Keywords: *mental health, sleep quality, physical activity, young adults, psychological well-being, predictive modeling*

Introduction

Mental health is a multidimensional construct that encompasses emotional, psychological, and social well-being, influencing how individuals think, feel, and behave. In recent years, research has increasingly highlighted the importance of lifestyle factors particularly physical activity and sleep quality as crucial determinants of mental health outcomes.

Physical activity, ranging from structured exercise to routine movement, has been consistently associated with reductions in symptoms of anxiety, depression, and stress, and with improvements in mood and cognitive function. Regular engagement in physical activity helps regulate neurotransmitters (such as serotonin and dopamine), reduces physiological stress responses (e.g., cortisol), and promotes overall emotional resilience.

Sleep quality, which involves both subjective restfulness and physiological sleep architecture, plays an equally vital role in psychological health. Poor sleep quality has been linked to greater risk for anxiety, depressive symptoms, and diminished cognitive performance, whereas adequate sleep supports emotional regulation, memory consolidation, and stress recovery.

Background

Mental health is much more than just the absence of illness, it is a multidimensional construct that shapes how we think, feel, and navigate our social world. In today's fast-paced society, we often treat our bodies like machines that don't need maintenance. However, lifestyle choices specifically how much we move and how well we rest are the "silent engines" of our psychological well-being. We selected this topic because, while most people know that exercise and sleep are "good," few realize how they work together to create emotional resilience.

Theoretical Framework

The Endorphin & Neurotransmitter Hypothesis

This theory suggests that physical activity triggers a chemical "reward" in the brain by regulating serotonin and dopamine while lowering cortisol (the stress hormone).

The Social Cognitive Theory

This suggests that exercise improves mental health not just through biology, but by enhancing self-esteem and providing opportunities for social interaction.

Study variables

Independent variable

Physical Activities levels (Measured using International Physical Activity Questionnaire – Short Form)

Sleep Quality (Measured using Sleep Quality Scale - SQS)

Dependent variable

Mental Health (Measured using The Warwick-Edinburg Mental Well-being Scale – WEMWBS)

Rationale and Significance

The significance of this study lies in its focus on modifiable factors. Unlike genetics, we can change our activity levels and sleep hygiene. By identifying which factor has the strongest impact, we can help design better public health strategies to reduce the global burden of depression and anxiety.

Literature Review

Schuch et al. (2018) argue that physical activity is a "strong preventive factor," showing that active people have a significantly lower risk of ever developing depression.

Biddle and Asare (2011) complement this by focusing on children and adolescents, noting that even "moderate" levels of activity are enough to boost mood and self-perception.

Kredlow et al. (2015) bridge these two sides by suggesting that the reason exercise makes us feel better is often because it "fixes" our sleep first—by reducing the time it takes to fall asleep and increasing total rest time.

However, Baglioni et al. (2011) offer a critical counter-point. They argue that poor sleep isn't just a symptom of being unhappy; it is an independent risk factor that doubles the risk of depression, regardless of other lifestyle habits.

Finally, Kandola et al. (2020) argue for a combined approach. Their longitudinal data suggests that the best mental health outcomes occur when lifestyle interventions target both activity and sleep hygiene simultaneously.

Methodology

Aim & Objective

- The main goal of this research is to see how daily habits, specifically how much people exercise and how well they sleep, help predict their overall mental health.
- The study looks at how these two behaviors work together to improve emotional well-being and mental strength in adults.

Research design

The study used a Quantitative Correlational and Predictive Design. It measured how two factors physical activity and sleep quality relate to and predict a person's mental health. Data was collected once from 50 young adults using three simple surveys.

Research question

To what extent do modifiable lifestyle factors, specifically physical activity levels and sleep quality, significantly predict mental health outcomes among adults?

Hypothesis

Null hypothesis (H_0): Physical activity levels and sleep quality do not significantly predict mental health outcomes among adults.

Alternative hypothesis (H_1): Physical activity levels and sleep quality are significant predictors of mental health, with higher levels of activity and better sleep quality correlating to improved emotional and psychological well-being.

Operational Definitions of Variables

Physical activity levels. Any bodily movement produced by skeletal muscles that requires energy expenditure, ranging from moderate daily tasks to vigorous exercise.

Sleep Quality. A clinical measure of sleep efficiency, including sleep onset latency (time to fall asleep), total sleep time, and subjective feelings of restfulness.

Mental Health. The absence of clinical symptoms of anxiety and depression, coupled with high levels of cognitive function and emotional resilience.

Inclusion criteria

- **Age:** Adults specifically within the young adult age bracket of 18–25 years.
- **Participation:** Individuals willing to complete three standardized psychometric scales (IPAQ, SQS, and WEMWBS).
- **Consent:** Participants who were informed of the study's objectives regarding public health and lifestyle factors.

Exclusion criteria

- **Age:** Individuals falling outside the 18–25 year range (as the sampling focused on a "representative snapshot" of this specific demographic).
- **Incomplete Data:** Though not explicitly stated as a "rule," the results only accounted for the 50 individuals who completed the full assessment.

Sampling strategy

A convenience sampling technique was used to collect data from participants who were easily accessible and willing to participate in the study.

Participants

The sample consisted of 50 participants aged between 18 and 25 years.

Instruments

International Physical Activity Questionnaire (IPAQ) Used to assess physical activity levels.

Sleep Quality Scale (SQS) Utilized to measure sleep patterns and restfulness.

The Warwick-Edinburg Mental Well-being Scale (WEMWBS): Employed to measure the dependent variable of mental health.

Statistical Analysis

Data were analyzed using SPSS software. Descriptive statistics, correlation analysis, and regression analysis were conducted.

Ethical Considerations

- Informed consent was obtained from all participants before their participation in the study.
- The confidentiality and anonymity of all participants were maintained throughout the research.
- Participation was voluntary, and participants had the right to withdraw from the study at any time.

Results

Table 1

Demographic Characteristics of Sample (N=50)

Variables		*n*	*%*
Age			
	18-21	45	90
	22-25	5	10
Gender			
	Male	16	32
	Female	34	68

Note. n= Sample Size, %= Percentage

Table 1 indicates the frequencies and percentages of demographic characteristics of the sample such as age and gender. It is found that people of an age range 18-21 were 90%, while 22-25 age group people were 10%. Also, number of male *(n=16)* and females *(n=34)* participated in the study.

Table 2

Psychometric Properties of Research Instruments

Scales	M	S. D	Range	Cronbach's α
IPAQ	3850	2140	10,540	.71
SQS	25.04	4.23	17	.425
CQW	30.60	6.73	28	.744

*Note. M= Mean, S. D= Standard Deviation, **α=** Reliability Coefficient*

Table 2 shows the psychometric properties for the scales used in the present study. The Cronbach's α values for IPAQ(.71) ,SQS (.425) and CQW (.744).

Table 3

Correlation Analysis (N=50)

Variables	1	2	3
Physical Activity	-	-.365**	-.038
Sleep Quality	-	-	.349
Mental Health	-	-	-

Table 3 indicates the correlation between physical activity, sleep qualtiy and mental health. The results show that there is a significant, negative and weak *(r=.365,p>.01)* correlation between physical activity and sleep quality. Furthermore,there is negative, non-significant and weak (*r= -.038*) correlation between physical activity and mental health. There is positive, non-significant and weak (*r= .349*) correlation between sleep quality and mental health.

Table 4

Regression Predicting Mental Health from Physical Activity and Sleep Levels

	B	*SE*	β	*t*	*p*
Physical Activity	.000	.000	.103	.705	.484
Sleep Quality	.615	.232	.387	2.650	.011

Note. B = unstandardized coefficient, SE = standard error, β = standardized coefficient A multiple linear regression analysis was conducted to examine whether physical activity and sleep quality predicted the outcome variable among a sample of 50 participants. The results showed that sleep quality was a significant positive predictor,*(β = .387, t = 2.65, p = .011*) indicating that higher sleep quality was associated with higher levels of the outcome variable; specifically, a one-unit increase in sleep quality led to a 0.615 unit increase in the outcome *(B = .615, SE = .232*). In contrast, physical activity was not a significant predictor (*β = .103, t = .705, p = .484*) suggesting that it did not make a meaningful contribution to the model.

Discussion

This research explores how physical activity, sleep quality, and mental health are connected among 50 adults. Mental health is viewed as a broad concept that includes emotional, psychological, and social well-being, shaping how people think, feel, and behave. The study aimed to examine whether everyday lifestyle habits such as exercise and good sleep could influence mental health outcomes. Statistical analyses in SPSS, including descriptive statistics, reliability testing, and multiple regression, were used to understand how these factors interact.

The study was guided by two hypotheses. The Null Hypothesis (H_o) suggested that physical activity and sleep quality have no significant relationship with mental health. In contrast, the Alternative Hypothesis (H_1) proposed that higher levels of exercise and better sleep would positively predict mental health. Testing these hypotheses helps determine whether promoting exercise and healthy sleep habits could support psychological well-being.

The demographic results showed that most participants were young adults. Around 90% were between 18–21 years old, while 10% were aged 22–25**,** and 68% of the sample was female**.** Reliability analysis

indicated acceptable consistency for the Mental Health scale (.744) and Physical Activity scale (.71). However, the Sleep Quality Scale had a lower reliability (.425), suggesting that its results should be interpreted with some caution.

Correlation analysis revealed weak relationships among the variables. Physical activity had a weak negative correlation with sleep quality and a very small, non-significant relationship with mental health. Sleep quality, however, showed a weak positive relationship with mental health, suggesting that individuals who sleep better may experience slightly improved psychological well-being.

Regression results highlighted sleep quality as a significant positive predictor of mental health, meaning better sleep was associated with better psychological outcomes. This finding supports previous research showing that sleep disturbances can increase the risk of depression. However, physical activity did not significantly predict mental health in this study, which differs from many studies that link exercise with improved mood.

Limitations

- A primary concern is the low Cronbach's alpha for the Sleep Quality Scale (.425), which suggests that the instrument may not have consistently captured the construct of sleep architecture within this specific sample.
- Furthermore, the sample size of 50 participants is relatively small, which limits the statistical power of the regression model and makes it difficult to generalize these findings to the broader adult population.
- The heavy demographic tilt toward individuals aged 18-21 also means the results may not reflect the lifestyle dynamics or mental health challenges of older adults.
- Finally, the reliance on self-reported data through scales like the IPAQ introduces the potential for subjective bias or recall inaccuracies regarding actual physical activity levels.

Recommendations

- To build upon these findings, future research should endeavor to recruit a larger and more age-diverse sample to ensure that the results are representative of various life stages.
- It is also recommended that researchers utilize more objective measurements, such as actigraphy or polysomnography for sleep and accelerometers for physical activity, to overcome the reliability issues associated with self-report surveys.
- Given the significance of sleep quality in this model, public health interventions should prioritize integrated "lifestyle hygiene" programs that specifically target sleep quality alongside physical movement to maximize synergistic benefits for psychological well-being.

Conclusion

In summary, this investigation reinforces the critical role of sleep quality as a primary modifiable determinant of mental health among young adults. While the study did not find a direct significant predictive link for physical activity in this particular model, the existing literature and observed correlations suggest it remains a vital component of a healthy lifestyle that may influence mental health indirectly. Ultimately, the data suggests that enhancing sleep hygiene is a potent strategy for fostering emotional regulation and resilience, making it a crucial focal point for both clinical practice and public health policy.

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