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# Assessing the Impact of Nature-Based Outdoor Activities on the WHO-5 Well-Being Index

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## ABSTRACT

*This study examines the association between nature-based outdoor activities and subjective well-being among adventure tourists in Gilgit-Baltistan, Pakistan. Drawing on environmental psychology and public health literature, the research evaluates psychological outcomes of trekking, hiking, and camping using the World Health Organization-5 Well-Being Index. Data collected from 59 participants indicate a high overall well-being score, exceeding international clinical thresholds for depression screening. Demographic analysis reveals variations by age, gender, and education level, highlighting structural and sociocultural influences on access to restorative environments. The findings support the integration of structured outdoor activity into population-level mental health strategies, particularly within low- and middle-income country contexts.*

***Keywords:*** *Adventure tourism, Gilgit-Baltistan, nature-based outdoor activities, psychological well-being, WHO-5 Well-Being Index*

## INTRODUCTION

Mental health disorders represent one of the most significant public health challenges of the present century, with approximately one billion individuals affected worldwide (World Health Organization [WHO], 2022a). Depression and anxiety contribute substantially to disability, lost productivity, and reduced quality of life, resulting in an estimated global economic loss of one trillion US dollars annually. The COVID-19 pandemic intensified this burden, leading to a reported 25% increase in anxiety and depressive disorders during its first year (WHO, 2022b). These trends expose serious limitations in existing treatment models, particularly in low- and middle-income countries where access to formal mental health services remains restricted.

Parallel to this rise in psychological distress is a shift toward predominantly indoor living. Contemporary populations spend close to 90% of their time inside enclosed environments, reducing contact with natural stimuli that historically shaped human cognitive and emotional functioning (Velux, 2018). This disconnection has been linked to attention fatigue, emotional dysregulation, and reduced stress tolerance. Within this context, engagement with natural environments through physical activity has gained recognition as a promising non-clinical intervention.

Gilgit-Baltistan offers a distinctive setting for examining such effects. Characterized by extreme altitude, biodiversity, and minimal urban intrusion, the region supports forms of adventure tourism that require sustained physical effort and cognitive engagement. Trekking and camping in this terrain involve prolonged

exposure to natural elements and limited digital connectivity, creating conditions conducive to psychological restoration. Despite extensive international literature on green exercise, empirical evidence from high-altitude contexts in South Asia remains limited. This study addresses that gap by assessing well-being outcomes among adventure tourists using a standardized psychometric tool.

## METHODOLOGY

A quantitative cross-sectional design was adopted to assess subjective well-being among individuals participating in trekking, hiking, and camping activities in Gilgit-Baltistan. The target population consisted of domestic and international tourists aged 18 to 45 years who were actively engaged in outdoor activities beyond passive sightseeing. A total of 59 respondents were recruited through purposive sampling at trekking hubs and campsites, supplemented by snowball referrals within expedition groups.

Data were collected using the WHO-5 Well-Being Index, a validated five-item instrument measuring positive psychological functioning over the previous two weeks (Topp et al., 2015). Responses were recorded on a six-point Likert scale, producing raw scores ranging from 0 to 25 and percentage scores from 0 to 100. Scores below 50 were treated as indicative of reduced well-being. Descriptive statistical analysis was conducted to evaluate overall well-being and demographic variation across age, gender, and educational attainment.

## RESULTS

The sample was predominantly male (91.5%), with participants largely drawn from younger age groups and higher education levels. Two-thirds of respondents were under 25 years of age, and more than 85% held a bachelor's degree or higher. This demographic profile reflects the physical demands and economic costs associated with high-altitude adventure tourism.

### Demographic Profile. The participants who participated in this study

The demographic data reveals a distinct profile of the adventure tourist in Gilgit-Baltistan, characterized by youth, high education, and a massive gender imbalance.

**Table 1: Demographic Distribution**

| Variable | Category | Frequency () | Percentage (%) |
|---|---|---|---|
| **Age** | 15–25 | 39 | 66.10% |
| | 26–35 | 12 | 20.30% |
| | 36–45 | 6 | 10.20% |
| | 46+ | 2 | 3.40% |
| **Gender** | Male | 54 | 91.50% |
| | Female | 5 | 8.50% |
| **Education** | Intermediate | 8 | 13.60% |
| | Bachelor | 37 | 62.70% |
| | Master or above | 14 | 23.70% |

The Youth Dominance is Nearly two-thirds of the participants were under 25. This likely reflects the physical demands of high-altitude trekking and the prevalence of university student groups visiting the region.

While in Gender Gap 91.5% male participation rate is a critical finding. It highlights that in the context of Pakistan, outdoor adventure remains a heavily male-dominated sphere, likely due to cultural restrictions on female mobility and safety concerns in remote areas.

In Educational Elite Over 85% of participants held a Bachelor's degree or higher, suggesting that NBOAs in this region are largely the preserve of the educated middle and upper classes who have the leisure time and disposable income to travel.

**Table 2: WHO-5 Well-Being Index Scores**

| Metric | Raw Score (0–25) | Percentage Score (0–100%) | Clinical Implication |
|---|---|---|---|
| Mean | 17.93 | 71.73% | High Well-Being |
| Median | 19 | 76.00% | High Well-Being |
| Std. Deviation | 4.06 | 16.22% | Moderate Variability |
| Cut-off (50) | - | 11.8% of sample | Screen for Depression |

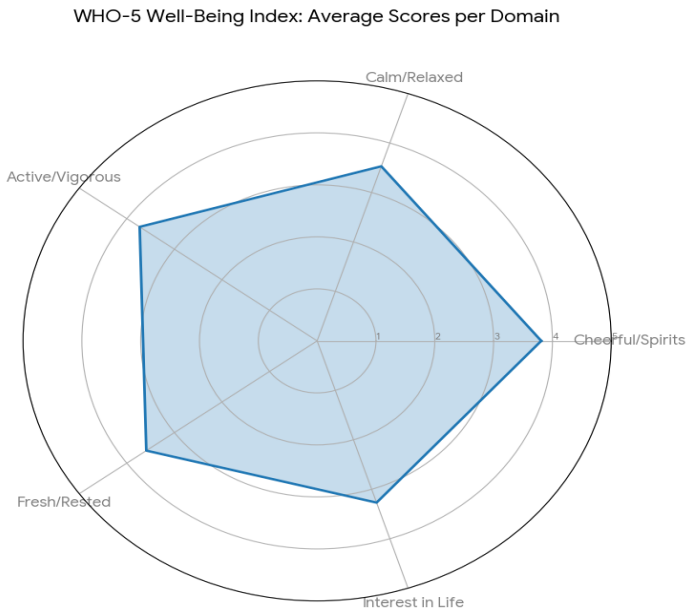
The mean score of 71.73% is substantially higher than the clinical cut-off of 50%. This indicates that the average trekker in Gilgit-Baltistan is not only free from depression but is experiencing a state of flourishing. Only 11.8% of the sample scored below 50, compared to significantly higher rates of distress found in general student populations (often >40% prevalence of distress).

**Table 3: Item-Level Analysis (Mean Score out of 5)**

| Item | Dimension | Mean Score | Analysis |
|---|---|---|---|
| 1. Cheerful | Mood | 3.81 | Highest score; indicates strong hedonic lift. |
| 2. Active/Vigorous | Energy | 3.73 | Second highest; validates "Green Exercise" effect. |
| 3. Fresh/Rested | Restoration | 3.59 | Indicates effective recovery from fatigue (ART). |
| 4. Calm/Relaxed | Anxiety | 3.53 | Lower than vigor; likely due to physical exertion. |
| 5. Interest in Life | Motivation | 3.27 | Lowest score; suggests persistent existential stress. |

The data reveals a "High Energy/High Mood" profile. Participants felt significantly more "Cheerful" and "Active" than they did "Interested in daily life." This discrepancy is fascinating; it suggests that while the immediate experience (trekking) was invigorating, the connection to their broader "daily life" (likely academic or professional) remained a source of lower satisfaction. The trek acted as a temporary, potent escape.

**WHO-5 Domain Analysis (Radar Chart)**




*Note.* Figure 1 is a radar graph that shows the average scores (0–5) for each of the five items of WHO 5 wellbeing index.

The radar graph plots the average scores (0–5) for each of the five items which are Cheerful & Good Spirits: 3.81, Calm & Relaxed: 3.53, Active & Vigorous: 3.73, Fresh & Rested: 3.59, Interest in Daily Life: 3.27

The graph shows a relatively balanced well-being profile. The strongest areas are "Feeling Cheerful" and "Feeling Active". The area that shows the most room for improvement is "Interest in Daily Life", which sits slightly closer to the center of the chart compared to the other four indexes. This is common in academic or student populations where daily routine can sometimes feel repetitive.

The findings in Table 3. indicate a high overall level of well-being among participants of nature-based outdoor activities, with a mean score of 71.73%. According to the WHO-5 screening criteria, only 11.8% of the sample scored below the threshold of 50%, suggesting that the vast majority of participants maintain a "Good" level of mental well-being

Overall well-being scores were high, with a mean WHO-5 percentage score of 71.73%. This value exceeds the commonly used clinical screening threshold for depression and aligns with population norms reported in high-income countries. Only a small proportion of participants scored below 50, suggesting relatively low levels of psychological distress within the sample.

Item-level analysis indicated strongest effects in mood and energy domains, with participants reporting elevated feelings of cheerfulness and vitality. Scores related to calmness and life interest were comparatively lower, suggesting that while outdoor activity produced immediate emotional and physical benefits, broader life stressors may persist. Age-stratified analysis revealed a dip in well-being among individuals aged 26 to 35 years, consistent with patterns observed in transitional career stages. Higher education levels were associated with better outcomes, indicating a socioeconomic gradient in restorative benefits.

## DISCUSSION

The findings support existing theoretical models that link natural environments to psychological recovery. The high well-being scores observed align with predictions of the Biophilia Hypothesis and Stress Reduction Theory, which posit innate human responsiveness to natural settings and measurable reductions in physiological stress markers following exposure (Park et al., 2010). The elevated energy and mood scores further reflect benefits associated with combined physical exertion and environmental immersion, as reported in outdoor adventure studies (Mutz & Müller, 2016).

The reduced scores among participants in early career stages point to the influence of structural stressors that may limit the extent of psychological restoration. Financial pressure, employment instability, and family responsibilities likely moderate the impact of short-term outdoor experiences. The pronounced gender imbalance raises additional concerns. Cultural norms and safety constraints restrict women's participation in adventure tourism, limiting access to an intervention shown to support mental well-being. This disparity reflects broader inequities in recreational health opportunities.

High-altitude environments may offer distinct restorative mechanisms through sustained attention demands and exposure to expansive natural stimuli. The combination of physical challenge and perceptual immersion may strengthen resilience and self-efficacy, contributing to longer-term psychological benefits beyond the duration of the activity.

## CONCLUSION

Participation in nature-based outdoor activities in Gilgit-Baltistan is associated with high levels of subjective well-being, exceeding international screening benchmarks for depression. The results affirm the value of structured engagement with natural environments as a viable public health resource, particularly in settings with limited clinical infrastructure. Demographic disparities underscore the need for inclusive policies that broaden access to outdoor recreation. Integrating adventure-based programs into preventive mental health strategies may offer a scalable and culturally adaptable approach to improving population well-being.

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