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Research Article

## ASSOCIATION OF SLEEP POSITION WITH PSYCHOLOGICAL WELLBEING-A CROSS-SECTIONAL STUDY AMONG YOUNG ADULTS OF PAKISTAN

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**Background:** Psychological well-being (PWB) is defined as the normal functioning of the mind that contributes to enhanced overall health for individuals. This study aims to contribute the development of psychological well-being.

**Objectives:** The objective of the study is to determine the association between four sleep positions and psychological well-being in young adults in Pakistan.

**Methodology:** This cross-sectional study was conducted between November 2023 and March 2024. A total of 436 participants, young adults aged 18-26, both male and female from Pakistan were included in the study. A questionnaire was distributed to the participants using Google Forms.

**Results:** A correlation test was conducted to evaluate the relationship between sleep position and PWB. A p-value of 0.046 indicated a significant association, with a Pearson correlation coefficient of -0.201 showing a negative association between sleep position and high psychological well-being. Additionally, a p-value of 0.035 and a correlation coefficient of 0.192 indicated a significant positive correlation between sleep position and low psychological well-being.

**Conclusion:** This study revealed a significant correlation between sleep position and psychological well-being (PWB). A negative correlation was found between sleep position and high psychological well-being, while a positive correlation was observed in participants with low psychological well-being.

**Keywords:** Psychological Well-Being (PWB), Sleep Positions, Autonomy, Self-Acceptance.

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## INTRODUCTION:

Psychological well-being (PWB) is crucial for overall health, and adequate sleep is essential for maintaining it. Sleep abnormalities are prevalent, with a significant portion of the population experiencing sleep problems (1-6).

Psychological disturbance are also common, affecting a substantial number of individuals globally. Understanding the relationship between sleep positions and psychological well-being can provide valuable insights for addressing psychological issues and improving overall health. While previous research has established a link between sleep and psychological well-being, the specific impact of different sleep positions on psychological well-being remains unclear. This study aims to investigate this association among young adults in Pakistan, highlighting the importance of sleep for mental health and well-being(7-17).

## METHODOLOGY:

This cross-sectional study was conducted between November 2023 and March 2024. The study received approval from the ethical review board of Azad Jammu and Kashmir Medical College. By utilizing the WHO sample size calculation with a margin of error (MoE) at 5% and confidence interval (CI) of 95%, the sample size was

determined to be 385. Ultimately, data from 436 participants were collected, resulting in an MoE of 4.69% and CI of 95.31%.

## Inclusion & Exclusion Criteria

The study encompassed both male and female young adults (aged 18-26) from various regions of Pakistan. Individuals with known psychiatric disorders or taking psychiatric medications were excluded from participation.

## Study Tool and Data Collection

A questionnaire in English was distributed to the participants via Google Forms. The questionnaire consisted of 45 questions divided into three sections: demographics, sleep position, and psychological well-being.

The demographic section included questions about age and sex. Sleep position was evaluated by inquiring about preferred positions such as left-sided, right-sided, supine, and prone. Psychological well-being was assessed using the C. Ryff scale, a 42-item scale with six sub-variables: self-acceptance, autonomy, environmental mastery, personal growth, personal relationships, and purpose in life. Each question was scored on a six-point Likert scale, with some questions reverse-scored (Table1) (18).

## Questionnaire Distribution

**Table 1:** C. Ryff Psychological Well-being (PWB) scale question distribution. The Grey-colored questions were reverse -scored.

Scales	Scale Items						
Autonomy(A)	01	07	13	19	25	31	37
Environmental Mastery (EM))	02	08	14	20	26	32	38
Personal Growth (PG)	03	09	15	21	27	33	39
Positive Relations with Others (PR)	04	10	16	22	28	34	40
Purpose in Life (PL)	05	11	17	23	29	35	41
Self-Acceptance (SA)	06	12	18	24	30	36	42

## Statistical Analysis

A statistical significance level of  $p = 0.05$  was set. The psychological well-being score was calculated by summing the scores of each sub-variable. The data was analyzed using SPSS 26.0, with numerical values reported as mean and standard deviation. Correlation tests were conducted between sleep position and psychological well-being categories. The frequency of sleep positions in relation to high and low psychological well-being was also analyzed.

## RESULTS:

The study involved 436 young adults aged 18-26, both male and female, residing in Pakistan. The response rate was 50%. Of the respondents, 147 (33.6%) were male and 290 (66.4%) were female (Table 1). The mean and standard deviation of sub-variables were calculated. The scores were categorized into low and high psychological well-being (Table 3).

A correlation test was conducted on the data to assess the relationship between sleep position and psychological well-being (PWB). The results indicated a significant association with a  $p$ -value of

0.046 and a Pearson correlation coefficient of -0.201 for participants with low psychological well-being (153 and below) (Table 4). For individuals with high psychological well-being (189 and above), the correlation coefficient was 0.192 with a p-value of 0.035 (Table 4).

The breakdown of sleep positions among participants with low psychological well-being was

**Table 2: Gender Distribution**

Gender	Frequency(n)	Percentage (%)
Male	147	33.6%
Female	290	66.4%
Total	437	100

**Column Descriptions:**

- **Gender:** Lists the gender categories represented in the data set.
- **Frequency (n):** Indicates the number of individuals in each gender category.
- **Percentage (%):** The proportion of each gender category as a %age of the total individuals.

**Row Descriptions:**

- **Male:** Represents the number of males and their percentages as per the total participants
- **Female:** Represents the number of females and their percentage as per the total participants
- **Total:** Provides the overall count of individuals and confirms that the total percentage is 100%.

**Footnotes:**

- Percentages are rounded off and their total sum is equal to 100%.
- The **Total** row summarizes the complete data set.

**Data Source:**

- Data is derived from the population studied as of January 2024.

**Units of Measurement:**

- **Frequency (n):** Number of individuals.
- **Percentage (%):** Proportion of the total, expressed as a percentage.

**Table 3: Measures of Central Tendency**

Psychological Well-being	Mean $\pm$ SD
Self Acceptance	29.23 $\pm$ 5.608
Autonomy	27.93 $\pm$ 5.264
Environmental Mastery	26.72 $\pm$ 4.729
Personal Growth	29.88 $\pm$ 5.028
Personal Relations with others	29.19 $\pm$ 5.069
Purpose in Life	29.75 $\pm$ 5.565

**Column Descriptions:**

- **Psychological Well-being:** Lists the six sub variables of Psychological Well-being.

as follows: 56 (51.9%) on the right side, 27 (25%) on the left side, 11 (10.2%) supine, and 14 (13%) prone (Table 5) (Figure 1). In contrast, those with high psychological well-being had the following distribution: 20 (20.6%) on the left side, 58 (59.8%) on the right side, 6 (6.2%) supine, and 13 (13.4%) prone (Table 6) (Figure 2).

- **Mean  $\pm$  SD:** Indicates the Mean and Standard deviation of all sub-variables of the Psychological Well-being Scale.

**Row Descriptions:**

- **Self-Acceptance:** represents sub variable of Psychological Well-being
- **Autonomy:** represents sub variable of Psychological Well-being
- **Environmental Mastery:** represents sub variable of Psychological Well-being
- **Personal Growth:** represents sub variable of Psychological Well-being
- **Personal Relations with others:** represent sub variable of Psychological Well-being
- **Purpose in Life** represents sub variable of Psychological Well-being

**Data Source:**

- Data is derived from the population studied as of January 2024.

**Units of Measurement:**

- **SD:** represents standard deviation.

**Table 4: Score Percentile of Psychological Well-being scale**

0-25 (low PWB)	153
26-50 (medium PWB)	170
51-75 (medium PWB)	189
76-100 (high PWB)	235

**Column Descriptions:**

- **Score Percentile:** Division of psychological Well-being in 4 percentiles.

**Row Descriptions:**

- **0-25:** represents low levels of Psychological Well-being
- **26-50:** represents medium levels of Psychological Well-being.
- **51-75:** represents medium levels of PWB.
- **76-100:** include those with high PWB.

**Data Source:**

- Data is derived from the population studied as of January 2024.

**Table 5: Bi-variability Correlation Analysis**

	p-value	Pearson Correlation Coefficient (r)
High Psychological Well-being (189 to 235) – Sleep Positions	0.035	-0.201
Low Psychological Well-being-(153 and below) – Sleep Positions	0.046	0.192

**Column Descriptions:**

- P-value: It should be less than 0.05 to show significant results.
- Pearson Correlation Coefficient(R): R value of 0.1 to 0.3 indicate weak correlation between the two variables and the polarity of the value indicates type of correlation.

**Row Descriptions:**

- High Psychological Well-being: A score of 189 to 235 is considered high and in the top 25% of the participants in terms of psychological well-being.
- Low Psychological Well-being: A score of 153 and below was considered to be low and in the lowest 25% of the participants in terms of psychological well-being.

**Data Source:**

- Data is derived from the population studied as of January 2024.

**Table 6: Frequency of Sleep Positions in Low Psychological Well-being (153 and below)**

Sleep Positions	Frequency (n)	Percentage (%age)
Right side	56	51.9%
Left side	27	25%
Supine	11	10.2%
Prone	14	13%
Total	108	100%

**Column Descriptions:**

- Sleep Positions: Lists four common sleep positions.
- Frequency: Indicates number of participants.
- Percentage: indicates percentage of participants in proportion to total.

**Row Descriptions:**

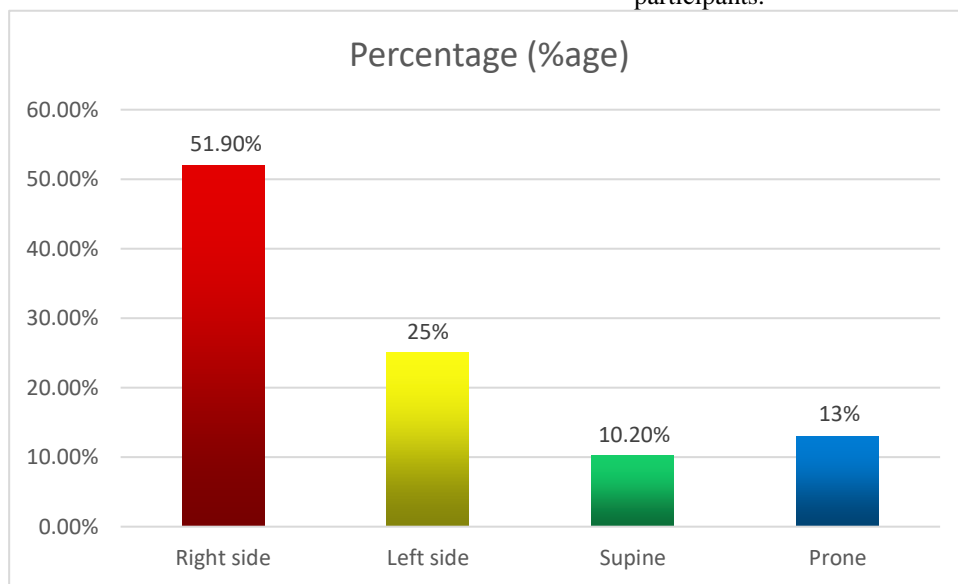
- Right side: It represents a lateral sleep position.
- Left side: It represents a lateral sleep position.
- Supine: It represents a sleep position lying on back.
- Prone: It represents a sleep position lying on abdomen.
- Total: includes total number of cases.

**Data Source:**

- Data is derived from the population studied as of January 2024.

**Units of Measurement:**

- Frequency(n): include number of cases.
- Percentage(%age): include percentage of participants.



**Figure 1: Percentage of participants with low psychological Well-being sleeping in different positions.**

**Table 7:** Frequency of Sleep Positions in High Psychological Well-being (189 and above)

Sleep Positions	Frequency (n)	Percentage (%age)
Right side	58	59.79%
Left side	20	20.61%
Supine	6	6.18%
Prone	13	13.40%
Total	97	100%

**Column Descriptions:**

- Sleep Positions: Lists four common sleep positions.
- Frequency: Indicates number of participants.
- Percentage: indicates percentage of participants in proportion to total.

**Row Descriptions:**

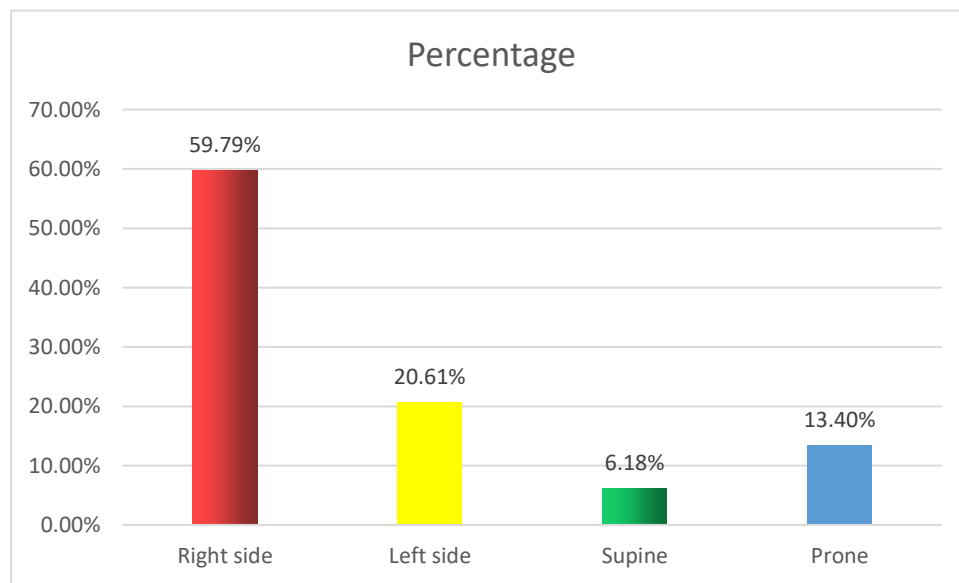
- Right side: It represents a lateral sleep position.
- Left side: It represents a lateral sleep position.
- Supine: It represents a sleep position lying on back.
- Prone: It represents a sleep position lying on abdomen.
- Total: includes total number of cases.

**Data Source:**

- Data is derived from the population studied as of January 2024.

**Units of Measurement:**

- Frequency(n): include number of cases.
- Percentage(%age): include percentage of participants.

**Figure 2:** Percentage of participants with high psychological Well-being sleeping in different positions.**DISCUSSION:**

The sleep position seems to be a consistent phenomenon. George et al. found in their study that six out of 14 sleeping positions were chosen by respondents for statistical analysis. For example, the semi-fetal position was selected by 13 respondents, where the body remains on the side with knees slightly flexed and an arm stretched over the head. The swastika position was chosen by 11 respondents, where the person lies prone, face down, with one arm extended above the head and one leg bent at the knee. The Dutch wife

position was chosen by six participants, where the individual lies prone with a pillow parallel to the body and hugged. The full fetal position was chosen by five participants (10%), where the body is bent up with knees drawn towards the chin. The flamingo position, a variation of the semi-fetal position, was chosen by four participants (8%), with one leg straight and the other leg flexed at the knee towards the upper body. The sandwich position, another variation of the semi-fetal position with legs on top of each other, was chosen by four participants (8%). The research found that respondents had no trouble

identifying their sleep position, and the high consistency over a six-month interval was reliable. (19)

In contrast, our study included four sleeping positions: left side, right side, supine, and prone. Individuals with low psychological well-being (153 and below), had the following sleep positions: 56 on the right side (51.9%), 27 on the left side (25%), 11 supine (10.2%), and 14 prone (13%). Among those with high psychological well-being (192 and above), the sleep positions were: 20 on the left side (20.61%), 58 on the right side (59.79%), 6 supine (6.18%), and 13 prone (13.40%). Our study revealed a significant association between sleep position and psychological well-being. A weak correlation was found between sleep position and psychological well-being concerning high (189 and above) and low (153 and below) psychological well-being.

Daniel et al. were the first to demonstrate a link between dementia and sleeping in a supine position. They found that people who slept on their backs for more than two hours per night were more likely to have neurological disorders. This association remained significant even after considering factors such as sex, age, diagnosis of obstructive sleep apnea (OSA), or snoring. An explanation for this is that gravity affects blood supply to the brain, which can impact the clearance of proteins in the brain (20–22). Another study suggested that the interaction between aging and sleep affects the clearance of lymphatic fluid. As people age, their breathing rates during sleep increase, possibly due to decreased lung efficiency, leading to shallower breaths and reduced positive pressure in the chest and average intracranial pressure. Additionally, the strength of arterial pulsing in the brain decreases with age (23).

According to Lewandowski et al., the time spent in the supine position was higher in the Parkinsonian Spectrum Disorder (PSD), Alzheimer's Disease Dementia (AD), and Mild Cognitive Impairment (MCI) groups compared to the Control Group Cognitive Group (CG). The percentage of patients with more than two hours of supine sleep position was higher in the PSD, AD, and MCI groups compared to the CG.

#### Research Limitations

This study aimed to determine the association between sleep position and psychological well-being but did not explore how different sleep positions influence well-being. Cohort studies are recommended to understand the true relationship between sleep positions and well-being. Another limitation was the small sample size, which prevented investigating external factors as

confounding variables. This article includes references older than five years due to a lack of recent literature on the topic.

#### CONCLUSION:

This research revealed a significant association between sleep position and psychological well-being, with a negative correlation found in participants with low psychological well-being and a positive correlation in those with high psychological well-being.

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