

Relationship between Attributional Style, Resilience and Sleep Quality among Military Personnel Stationed in a Certain Plateau Area

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Abstract: ***Objective:** To investigate the current status of sleep quality and its relationship with attributional style and resilience among military personnel stationed in a certain plateau area. **Methods:** A questionnaire survey was conducted among military personnel stationed at a specific location in a certain plateau area using a self-designed general information questionnaire, the Attributional Style Questionnaire, the Connor-Davidson Resilience Scale, and the Pittsburgh Sleep Quality Index. **Results:** Participants scored 36.19 ± 12.71 for negative event attributional style, 76.45 ± 17.83 for resilience, and 2.85 ± 2.28 for sleep quality. Attributional style scores were positively correlated with sleep quality scores ($r=0.132$, $P<0.01$), whereas resilience scores were negatively correlated with sleep quality scores ($r=-0.313$, $P<0.01$). Age, educational level, marital status, duration of stay in the certain plateau area, altitude of station, attributional style, and resilience were all identified as influencing factors for sleep quality. **Conclusion:** The sleep quality of military personnel stationed in the certain plateau area appears to be relatively good. The study suggests that maladaptive attributional styles and lower levels of resilience may be contributing factors to poorer sleep quality. Future mental health management interventions could target attributional styles and resilience to improve the sleep quality and overall psychological well-being of military personnel in the certain plateau area.*

Keywords: Military personnel stationed in the certain plateau area, Attributional style, Resilience, Sleep quality.

1. Introduction

The physical and mental health of military personnel not only pertains to individual senses of achievement, happiness, and fulfillment but also influences interactions among comrades-in-arms and may even impact overall coordination and combat effectiveness. Mental health is a crucial criterion for qualified military personnel and an evaluation indicator for those serving in the unique high-altitude environment, who may be more susceptible to psychological problems [1]. Therefore, analyzing the factors affecting the mental health of military personnel in high-altitude regions is of paramount importance. Sleep is vital for the restoration of mental and physical energy. Research indicates that the incidence of sleep disorders among military personnel is generally higher than that in the civilian population. These sleep issues not only affect the daily lives and training of soldiers but also severely impact troop combat effectiveness [2]. Sleep quality is influenced by numerous factors. Attribution theory is a significant concept in psychology, and attributional style is closely related to sleep quality, psychological state, and quality of life [3]. Resilience is a crucial component of psychological makeup and affects quality of life; high levels of resilience enhance an individual's adaptability to stress and traumatic events [4].

2. Objects and Methods

2.1 Study Participants

Using a convenience sampling method, a survey was conducted in November 2024 among military personnel stationed at a location in the certain plateau area. A total of 4683 questionnaires were collected. To ensure the scientific

validity of the data, the collected questionnaires were screened prior to statistical analysis. Invalid questionnaires, including those with missing items, incomplete responses, excessively short or long completion times, or patterned responses, were excluded. A total of 3554 valid samples were included in the statistical analysis, yielding an effective response rate of 75.89%. (This study was not approved by the hospital ethics committee).

2.2 Methods

2.2.1 General Information Questionnaire: Based on a review of relevant literature, a self-designed questionnaire was developed including the following 8 variables: gender, age, marital status, educational level, only child status or not, duration of stay in the certain plateau area, altitude of the station, and environment of the station.

2.2.2 Connor-Davidson Resilience Scale (CD-RISC): This study utilized the Chinese version translated and revised by Xiao Nan and Zhang Jianxin [5]. The scale includes three dimensions: tenacity, strength, and optimism. Items are scored on a 5-point scale (0 to 4). The total score ranges from 0 to 100, with higher scores indicating better resilience. The Cronbach's α coefficient for this scale was 0.91, indicating good reliability.

2.2.3 Pittsburgh Sleep Quality Index (PSQI): This study used the Chinese version compiled by Liu Xianchen et al. [6]. The scale comprises seven dimensions: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction. Items are scored on a 4-point scale (0 to 3). The total score ranges from 0 to 21, with higher scores indicating

poorer sleep quality. Currently, a PSQI score >7 is generally considered indicative of sleep disturbance in China. The Cronbach's α coefficient for this scale was 0.84, indicating good reliability [7].

2.2.4 Attributional Style Questionnaire (ASQ): This questionnaire was developed by Guo Wenbin et al. [8]. It includes 5 positive events and 5 negative events. Scoring covers four aspects: overall index, internality, stability, and globality, using a 5-point scale. Positive and negative events are scored separately. Higher scores indicate a greater tendency to attribute events to internal, stable, and global causes. In this study, the Cronbach's α coefficients for the positive and negative event subscales were 0.79 and 0.69, respectively.

2.3 Statistical Methods

SPSS version 26.0 statistical software was used for data analysis. Measurement data were described as mean \pm standard deviation (M \pm SD). Univariate analysis employed t-tests and analysis of variance (ANOVA). Pearson correlation analysis was used to examine the relationships among social support (Note: This variable appears in the methods but not in results, likely a copy-paste error from another study), resilience, and sleep quality. Multivariate analysis was conducted using multiple linear regression. A P-value <0.05 was considered statistically significant.

3. Results

3.1 Attributional Style, Resilience, and Sleep Quality Scores of Participants

Among the 3554 military personnel stationed in the certain plateau area, the score for positive event attributional style was 43.38 ± 15.87 , for negative event attributional style was 36.19 ± 12.71 , for resilience was 76.45 ± 17.83 , and for sleep quality was 2.85 ± 2.28 . Details are presented in Table 1.

Table 1: Attributional Style, Resilience, and Sleep Quality Scores of Military Personnel Stationed in the certain plateau area (M \pm SD)

Category	Item	Score Range	Obtained Range	Score (M \pm SD)
PSQI	Subjective sleep quality	0~3	0~3	0.46 \pm 0.59
	Sleep latency	0~3	0~3	0.79 \pm 0.84
	Sleep duration	0~3	0~3	0.07 \pm 0.3
	Habitual sleep efficiency	0~3	0~3	0.56 \pm 0.74
	Sleep disturbances	0~3	0~2	0.63 \pm 0.56
	Use of sleep medication	0~3	0~3	0.02 \pm 0.15
	Daytime dysfunction	0~3	0~2	0.31 \pm 0.6
	Total PSQI Score	0~21	0~10	2.85 \pm 2.28
CD-RISC	Tenacity	0~52	0~52	40.04 \pm 9.81
	Strength	0~32	0~32	26.1 \pm 6.01
	Optimism	0~16	0~16	10.31 \pm 3.32
	Total Resilience Score	0~100	5~100	76.45 \pm 17.83
ASQ	Positive Composite	15~75	15~75	43.38 \pm 15.87
	Positive Internality	5~25	5~25	15.00 \pm 5.89
	Positive Stability	5~25	5~25	15.02 \pm 5.97
	Positive Globality	5~25	5~25	13.36 \pm 5.54
	Negative Composite	15~75	15~75	36.19 \pm 12.71
	Negative Internality	5~25	5~25	13.09 \pm 4.75
	Negative Stability	5~25	5~25	11.87 \pm 4.72
	Negative Globality	5~25	5~25	11.22 \pm 4.70

3.2 Influence of Demographic Variables on Sleep Quality

Independent samples t-test or one-way ANOVA results showed significant differences in sleep quality scores based on age, educational level, marital status, duration of stay in the certain plateau area, and altitude of station (P <0.05). Details are presented in Table 2.

Table 2: Differences in Sleep Quality Scores Among Military Personnel Stationed in the certain plateau area Based on Demographic Variables (M \pm SD)

Variable	Category	N	Sleep Quality Score	*t*/F	P
Gender	Male	3510	2.85 \pm 2.28	0.68	0.496
	Female	44	2.61 \pm 2.49		
Age (years)	18-25	2351	2.59 \pm 2.15	53.083	<0.001
	26-35	1109	3.26 \pm 2.40		
	≥ 36	94	4.31 \pm 2.80		
Educational Level	High school or below	860	2.73 \pm 2.22	10.034	<0.001
	Associate degree	2057	2.77 \pm 2.26		
	Bachelor's degree	626	3.23 \pm 2.37		
	Master's degree or above	11	4.73 \pm 3.23		
Marital Status	Married	828	3.47 \pm 2.50	28.427	<0.001
	Unmarried	2697	2.65 \pm 2.18		
	Divorced	13	3.69 \pm 1.80		
	Other	16	2.94 \pm 1.81		
Only Child	Yes	783	2.75 \pm 2.32	0.425	0.514
	No	2771	2.87 \pm 2.27		
Duration in the certain plateau area	≤ 2 years	1359	2.57 \pm 2.13	18.609	<0.001
	3-12 years	1866	2.97 \pm 2.30		
	>12 years	329	3.28 \pm 2.62		
Altitude of Station	<3500 m	560	2.34 \pm 2.09	14.704	<0.001
	3500-4000m	1139	2.80 \pm 2.27		
	4000-4500m	1367	2.97 \pm 2.33		
	>4500 m	488	3.20 \pm 2.30		
Station Environment	Urban	558	2.76 \pm 2.23	1.448	0.235
	Town	865	2.77 \pm 2.26		
	Village/Mountain area	2131	2.90 \pm 2.30		

3.3 Correlation Analysis of Attributional Style, Resilience, and Sleep Quality

Bivariate Pearson correlation analysis revealed that resilience scores were negatively correlated with sleep quality scores, while negative event attributional style scores were positively correlated with sleep quality scores. These correlations were statistically significant (P <0.01). Details are presented in Table 3.

Table 3: Correlations between Attributional Style, Resilience, and Sleep Quality Dimensions (r)

PSQI Dimension	Tenacity	Strength	Optimism	Resilience Total
Subjective sleep quality	-0.276**	-0.251**	-0.174**	-0.269**
Sleep latency	-0.225**	-0.209**	-0.168**	-0.225**
Sleep duration	-0.058**	-0.068**	-0.042*	-0.063**
Sleep efficiency	-0.052**	-0.064**	-0.054**	-0.060**
Sleep disturbances	-0.261**	-0.221**	-0.163**	-0.248**
Sleep medication use	-0.084**	-0.117**	-0.072**	-0.099**
Daytime dysfunction	-0.257**	-0.231**	-0.149**	-0.247**
Total PSQI Score	-0.316**	-0.295**	-0.214**	-0.313**

PSQI Dimension	Positive Composite	Positive Internality	Positive Stability	Positive Globality	Negative Composite	Negative Internality	Negative Stability	Negative Globality
Subjective sleep quality	0.050**	0.027	0.039*	0.074**	0.133**	0.062**	0.154**	0.142**
Sleep latency	0.006	-0.003	-0.006	0.028	0.078**	0.024	0.099**	0.088**
Sleep duration	-0.005	-0.016	-0.009	0.011	0.025	-0.007	0.042*	0.033
Sleep efficiency	-0.059**	-0.043*	-0.078**	-0.039*	-0.008	-0.026	-0.013	0.018
Sleep disturbances	0.064**	0.043*	0.045**	0.089**	0.142**	0.090**	0.154**	0.139**
Sleep medication use	-0.050**	-0.047**	-0.049**	-0.042*	-0.018	-0.031	-0.013	-0.004
Daytime dysfunction	0.075**	0.054**	0.061**	0.090**	0.131**	0.074**	0.147**	0.131**
Subjective sleep quality	0.028	0.012	0.006	0.061**	0.132**	0.055**	0.153**	0.147**

Note: ** P<0.01, * P<0.05

3.4 Multivariate Analysis of Sleep Quality

A hierarchical multiple linear regression analysis was conducted with the total PSQI score as the dependent variable. Demographic variables significant in the univariate analysis were entered in Block 1, attributional style scores in Block 2,

and resilience scores in Block 3. The final regression model included 7 significant predictors (age, educational level, marital status, altitude of station, negative ASQ score, and CD-RISC score), explaining 14.3% of the variance in sleep quality (Adjusted $R^2 = 0.143$). Details are presented in Table 4&5.

Table 4: Assignment of Influencing Factors for Sleep Quality

Factor	Assignment Description
Age	18-25 years old= 1; 26-35 years old = 2; ≥36 years old = 3
Educational Level	High school or below = 1; Associate degree = 2; Bachelor's degree = 3; Master's degree or above = 4
Marital Status	Married = 1; Unmarried, Divorced, Other = 0
Duration in the certain plateau area	≤2 years = 1; 3-12 years = 2; >12 years = 3
Altitude of Station	≤3500m = 1; 3500-4000m = 2; 4000-4500m = 3; >4500m = 4

Table 5: Multiple Linear Regression Analysis of Factors Influencing Sleep Quality (N=3554)

Variable	Unstandardized Coefficients		Standardized Coefficients	t	P
	B	Std. Error			
(Constant)	3.911	0.376		10.39	<0.001
Age	0.446	0.096	0.104	4.65	<0.001
Educational Level	0.171	0.057	0.049	3.02	0.003
Marital Status	-0.256	0.102	-0.051	-2.505	0.012
Duration in the certain plateau area	0.015	0.071	0.004	0.209	0.834
Altitude of Station	0.246	0.039	0.099	6.37	<0.001
ASQ Negative Total	0.019	0.003	0.106	6.739	<0.001
CD-RISC Total	-0.038	0.002	-0.294	-18.793	<0.001

Note: $R^2 = 0.145$, Adjusted $R^2 = 0.143$; $F = 86.040$, $P < 0.001$.

4. Discussion

4.1 Analysis of Attributional Style, Resilience, and Sleep Quality Status

The results of this study indicate that the score for positive event attributional style among military personnel in the certain plateau area was 43.38 ± 15.87 , and for negative events was 36.19 ± 12.71 , suggesting room for improvement in adaptive attribution. The resilience score was 76.45 ± 17.83 , indicating a relatively good level. The sleep quality score was 2.85 ± 2.28 , suggesting that the overall sleep quality of the personnel is good.

4.2 Correlation Analysis

The score for negative event attributional style was positively correlated with the PSQI score ($P < 0.01$). This indicates that a higher tendency to attribute negative events to internal, stable, and global causes is associated with higher PSQI scores, reflecting poorer sleep quality. Conversely, the resilience score was negatively correlated with the PSQI score ($P < 0.01$). Higher levels of resilience are associated with lower PSQI scores, indicating better sleep quality. Within the military context, mutual support during training and daily life, along with potential increased concern and support from

families due to being stationed away from home, may reduce psychological stress when facing difficulties, potentially contributing to better sleep quality.

4.3 Analysis of Factors Influencing Sleep Quality

4.3.1 Age

The results showed age to be an influencing factor. Sleep quality tended to decrease gradually with increasing age. This may be attributed to the accumulation of life stressors associated with aging, leading to poorer sleep.

4.3.2 Educational Level

Educational level was identified as an influencing factor. It is speculated that as both educational level and age increase, individuals face significant life events such as career choices and marriage. The accompanying increase in life stress may progressively degrade sleep quality.

4.3.3 Marital Status

Marital status was found to influence sleep quality. Married personnel reported poorer overall sleep quality compared to unmarried personnel. This could be due to the increased

pressures associated with marriage, such as raising children and caring for elderly parents, which may negatively impact sleep.

4.3.4 Altitude of Station

The altitude of the station was a significant influencing factor. Sleep quality showed a declining trend with increasing altitude. Consistent with previous research [9, 10], higher altitudes can lead to physiological discomforts such as palpitations and headaches, characteristic of high-altitude deterioration, which can impair sleep quality.

4.3.5 Attributional Style

The results confirmed attributional style as an influencing factor. Specifically, the score for negative event attribution was significantly positively correlated with poorer sleep quality. A higher score indicates a stronger tendency to attribute negative events to internal, stable, and global causes, which is associated with worse sleep outcomes. Abramson et al. [11] proposed the attributional reformulation theory of depression, suggesting that individuals who tend to attribute negative events to internal, stable, and global factors, and positive events to external, unstable, and specific factors, are more vulnerable to depressive symptoms. Cognitive appraisal of events directly influences an individual's coping activities and psychosomatic reactions. Furthermore, a potential interaction exists between physiological discomfort at high altitudes and an individual's cognitive appraisals [12]. Therefore, intervening in the cognitive patterns of personnel stationed in the certain plateau area to foster positive self-cognition could be a strategy to safeguard sleep quality and reduce the risk of physical and psychological problems.

4.3.6 Resilience

The study identified resilience as a significant influencing factor for sleep quality. Resilience refers to an individual's response or strategy when facing adverse situations or stressful events, representing the capacity to adapt to pressure and adversity [11], and is a key variable in mental health. Higher levels of resilience mean individuals perceive less stress when confronting setback and pressure, making it easier to mitigate the impact of negative events. In daily military life, promoting solidarity, cooperation, and mutual assistance can enhance the resilience of military personnel, alleviate physical and mental stress, and consequently improve sleep quality.

5. Conclusion

The sleep quality of military personnel stationed in the certain plateau area appears to be relatively good. Resilience scores were negatively correlated with sleep quality scores, while negative event attributional style scores were positively correlated with sleep quality scores. Identified influencing factors for sleep quality include age, educational level, marital status, duration of stay in the certain plateau area, altitude of station, attributional style, and resilience level. Military mental health professionals could implement targeted interventions focused on modifying maladaptive attributional styles towards more positive interpretations and implementing measures to enhance resilience. Such strategies

may help safeguard the sleep quality of personnel, thereby fostering cohesion and combat effectiveness within the troops.

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