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ASSOCIATION BETWEEN PSYCHOLOGICAL DISTRESS, SLEEP QUALITY AND PHYSICAL ACTIVITY LEVELS AMONG PAKISTAN NAVY MILITARY PERSONNEL: A CROSS SECTIONAL STUDY

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Article Info

Abstract

BACKGROUND: Military personnel undergo intense training and various missions for the safety of their country and its citizens. In military, the strict hierarchical structure, stress regarding promotion, collectivism, frequent job transfer cause intense psychological distress, poor sleep and low PA levels which often go unnoticed in military settings. Thus, the study aimed to assess these factors among naval personnel in Karachi.

OBJECTIVE: To determine the association between the psychological distress, sleep quality and physical activity levels among Pakistan navy military personnel

METHODOLOGY: A cross-sectional study on 217 naval personnel used convenience sampling. Data were collected using K10, PSQI, and IPAQ

RESULT: Poor sleep (75.1%) and psychological distress (39.6%) were prevalent, while 88.4% participants had moderate to high PA levels. Distress was linked with sleep ($p<0.001$; H_0 rejected) and PA levels ($p=0.016$; H_0 rejected), while sleep-PA were non-significant ($p=0.057$; H_0 accepted).

CONCLUSION: In conclusion, there's a significant associations between psychological distress and both sleep quality and PA level. However, no statistically significant relationship was found between sleep quality and PA level. Overall, psychological distress appears to play a key role in its relationship with sleep and PA among Pakistan Navy personnel.

Keywords:
Psychological distress, Physical activity, Navy, Military personnel.

INTRODUCTION:

Psychological stress refers to a state of mental and emotional strain that arises when individuals perceive that environmental demands exceed their adaptive capacity [1] According to WHO, mental stress and conditions related to mental health are a major contributor to the global burden of mental disorders and can significantly impair daily functioning. [2] Naval military personnel undergo intense training and various missions for the safety of their country and its citizens. Due to the nature of their occupation, they are constantly exposed to high stress. [3][4]

Various studies have concluded that the reason for the high cortisol levels among naval military personnel included frequent risky missions, witnessing deaths, frequent day night shifts, weather crises, long standing hours, separation from family members, sleep deprivation, deployment, and financial burden. [5] According to the global prevalence of mental stress, depression in military personnel was 23%, which were even higher than a civilian population. Canadian military personnel reported a higher prevalence of mental disorders than the civilian population, which indicated that military personnel had much more mental difficulties compared to the general population. [6]. In Korea, a survey with 441 Korean military personnel in 2018 showed a prevalence of 7.1% and 3.5% for depression and anxiety disorder, respectively. [7] In military, for optimal performance, one must be psychologically, emotionally, and physically strong enough to accomplish the given task. Therefore, this research was conducted to measure the psychological distress among naval military personnel using Kessler Psychological Distress Scale (K10). This scale is a 10-item questionnaire designed to screen for the severity of non-specific psychological distress (anxiety and depression) over the past 30 days. [8]

Another crucial factor which is directly linked to mental health and physical activity levels is sleep quality. Poor sleep quality is characterized by difficulty initiating or maintaining sleep, non-restorative sleep, and daytime dysfunction. Sleep health holds a great importance and contribute to overall wellbeing of a human but unfortunately it often goes unnoticed in military settings due to the rigorous nature of the occupation. [9][10] The active duty personnel are at high risk of poor sleep health and required significant interventions as to improve sleep. [11] Efforts should be made to improve the quality of sleep in military domain. [12] A recent meta-analysis found that sleep quality in Navy showed a progressive trend of getting worse before COVID-19. [13] Poor sleep quality, short sleep duration and sleep loss are the serious health concerns and leaves a negative marks on mental, physical, emotional and cognitive health of a military personnel but these factors unfortunately often go unnoticed in military setting. [14] A study in the United States reported that nearly half of military personnel were screened as positive for disturbed sleep. [15] Military personnel who spend most of their time in sea especially during rain, storm, and cold weather are vulnerable to poor sleep quality, high stress, low motivation and thus less performance energy. [16] Thus, this study was set to examine the sleep quality among naval military personnel using Pittsburgh sleep quality index. PSQI is a widely used tool for examining the quality of sleep, and consist of 19 self-rated items that differentiates “poor” from “good” sleep. [17]

Physical activity is defined as “any bodily movement produced by skeletal muscles that requires energy expenditure”. [18] Recent meta-analysis studies reported a significant association between physical activity and depression, anxiety, suicidal ideation. In addition, most studies were conducted in Western countries. However,

the characteristics of the military's mission and culture and the prevalence of each mental disorder differs from country to country.[19] Thus, the association between physical activity levels, sleep quality and psychological distress in Karachi naval military personnel might show different results from previous studies. Therefore, this study aimed to identify the overall evidence between psychological distress, sleep quality and physical activity level among Pakistan navy military personnel. Different past studies assessed the effect of regular physical activity on stress and sleep but very few researches has worked on the reverse relationship. [20] Poor mental health and altered sleep wake cycle could lead to lack of motivation, poor concentration, daytime fatigue and higher absentees from work. [21]

Therefore, this study was set to understand the complicated relationship between these variables in navy. The results of this study would not only close the gap in literature but also help in developing the better health policies and interventions to improve the overall health status, physical performance and troop strength.

METHODOLOGY

The study followed a cross-sectional design and carried out in 5 naval sites in Karachi. 217 naval military personnel were recruited in the study through convenience sampling. The data was collected from the active-duty naval personnel (both male and females) who were currently serving in the Pakistan navy (aged 20-50) and were willing to participate. Meanwhile personnel who were diagnosed with psychiatric or neurological disorders, musculoskeletal conditions, congenital or acquired biomechanical abnormalities, systemic or inflammatory diseases and those on medications that significantly affect mental status, sleep, or physical activity levels were excluded from the study. Data were entered and analyzed using SPSS version 26.

RESULTS

Table: 01. Below table shows the mean, standard deviation of the participant's age, year of service, K10, PSQI and IPAQ.

	Mean ± SD
AGE	1.94±0.85
YEAR OF SERVICES	3.94±1.87
PD(K10)	2.87±1.09
SQ(PSQI)	1.94±0.69
PAL(IPAQ)	2.24±0.65

The mean and St. Deviation of age was 1.94 ± 0.85, whereas the mean and St. Deviation of years-of-service score was 3.94 ± 1.87. The mean and St. Deviation of psychological distress (K10), sleep quality (PSQI) and physical activity level (IPAQ) was 2.87 ± 1.09, 1.94 ± 0.69, 2.24 ± 0.65.

Table 2: Presents the gender distribution of study participants.

Gender	Frequency (n)	Percentage (%)
Male	197	90.8%
Female	20	9.2%
Total	217	100%

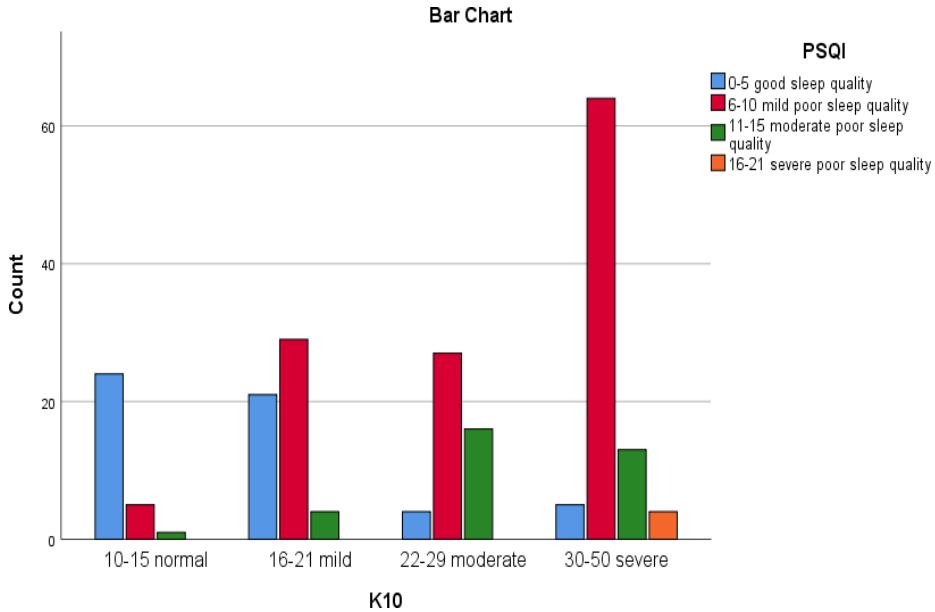
Most participants were male (90.8%), while females comprised only 9.2%.

Table 3: Association between psychological distress, sleep quality and physical activity among Pakistan Navy personnel

Chi-Square Tests			
	Value	**df**	**P value**
K10 Vs. PSQI chi square	93.104[a]	9	<0.001
K10 Vs. IPAQ chi square	15.565[a]	6	=0.016
PSQI Vs. IPAQ chi square	12.249	6	=0.057

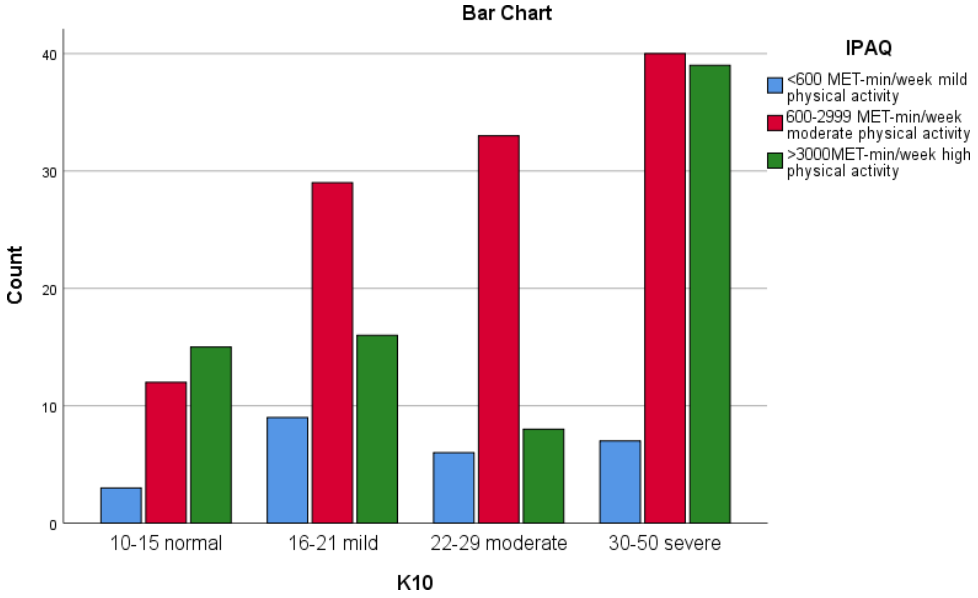
Table shows that theirs a statistically significant correlations between psychological distress (K10) and both physical activity (IPAQ) ($p = 0.016$) and sleep quality (PSQI) ($p < 0.001$). Physical activity (IPAQ) and sleep quality (PSQI) did not significantly correlate ($p = 0.057$).

Chart 1: Clustered Bar graph of K10 by PSQI



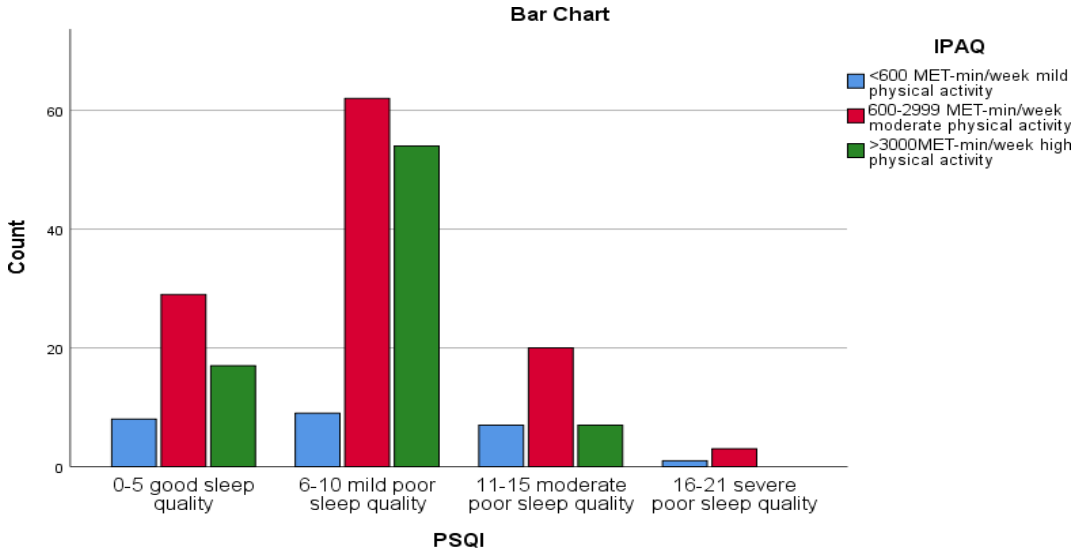
The chart shows relationship between K10 Psychological Distress Levels and PSQI Sleep Quality Categories

Chart 2: Clustered Bar graph of K10 by IPAQ



The chart shows the variations in physical activity levels across different psychological distress categories.

Chart 3: Clustered Bar graph of PSQI by IPAQ



The chart shows the distribution of physical activity levels according to sleep quality categories.

DISCUSSION

The current cross-sectional study was carried out among 217 active-duty personnel of the Pakistan Navy to identify the relationship between psychological distress, sleep quality and physical activity levels. Results showed the highest burden of psychological distress followed by sleep quality even though the physical activity levels were high Study suggested that the 39.6% participants were severely distressed while 75.1% participants

seemed to have poor sleep quality. Even though psychological distress and poor sleep quality percentages were quite high around 88.4% participants were found to have high physical activity levels. Study revealed that there was significant association between psychological distress and sleep quality (as the p value was < 0.001) and there was also a significant association between psychological distress and physical activity levels (as the p value was <0.016) but there was no significant association between sleep quality and physical activity levels (as the p value was found to be >0.057).

The current study holds a significant importance as it revealed that around one-third of the participants were found to have a severe psychological distress meanwhile only 13.8% were found to be mentally healthy. This data revealed that the rigorous work nature, high occupational load, hectic routine, constant day night shifts, frequent transfers, family and financial burden, weather crises, long standing hours, dangerous assignments leaves a negative impact on the mental, physical, cognitive and emotional health of a personnel serving in naval force. [22][23][24] Previous studies evaluated that the mental health problems are a major health concern and growing rapidly in military settings and have a negative impact on the physical performance, troop strength and overall wellbeing of a military personnel. [25]

The findings of the present study are in line with recent evidence that military personnel are more prone to have high to psychological distress and associated mental health problems than civilian population. Harrison et al. reported significant associations between sleep disturbances and symptoms of depression, anxiety, and Post-traumatic stress disorder in a study of U.S. sailors, highlighting the intertwined nature of mental health and sleep in military environments [26]

Another major concern among Pakistan Navy personnel was the quality of sleep. The present study found that 75.1% of the participants had poor sleep quality, and only 24.9% of them had good sleep quality. This prevalence is greater than the pooled global prevalence reported in a recent systematic review and meta-analysis of military personnel and veterans, which found that about 69% of military personnel experience poor sleep quality.[27] The higher prevalence in the present study could be due to occupational factors specific to naval service like shift duties, night watch schedules, prolonged operational demands, long standing hours, spending several months in sea, environmental disturbances and irregular work-rest cycles .

The results are supported by studies conducted among naval personnel regarding sleep quality. Russell et al. reported significant sleep deficiency among sailors assigned to U.S. Navy warships and underscored that inadequate sleep continues to be a common occupational health problem in naval environments [28]

The physical activity levels were found to be high majorly. About 52.5% of participants reported moderate physical activity while 35.9% reported high physical activity and only 11.5% reported low physical activity levels. Thus, the high prevalence of moderate-to-high physical activity in the present study reflects the occupational demands of naval service.

A significant association between psychological distress and sleep quality ($p < 0.001$) was one of the study's most notable conclusions. Naval personnel who were severely distressed had the poorer sleep quality. This result

is in line with recent research showing a reciprocal association between sleep and mental health

A direct relationship between psychological distress and sleep quality were repeatedly found in various studies conducted in the military set ups. According to Harrison et al., sailors with lower sleep quality showed more signs of anxiety, despair, and PTSD. Similarly, sleep disorders are highly linked to poor mental health outcomes and decreased operational preparedness, according to recent military study [26]. Thus, the significant association found in this study confirms previous research indicating that military personnel's psychological well-being and sleep quality are closely related.

The current study also revealed a significant association between psychological distress and physical activity levels. Many previous studies documented that the psychological stress can be manage by engaging in regular physical activity but a very little studies talked about how the poor mental health and high stress levels can act as a barrier in optimal physical performance. [29] The current study also evaluated that the psychological distress and physical activity levels shared a significant association (as the p value was found to be <0.016). Thus it is crucial to manage the mental health related concerns as to enhance the overall physical performance of military troops.

It was interesting to note that the study did not find any significant association between sleep quality and physical activity levels (as the p value was found to be >0.057) which showed that physical activity levels are not influenced by sleep quality alone. Overall, the current study adds significant data about the relationship among Pakistan Navy sailors between psychological distress, sleep quality, and physical activity. A significant percentage of participants reported experiencing severe psychological distress and poor sleep quality even while they continued to engage in relatively high levels of physical activity. These results imply that military personnel's psychological and sleep-related issues may not be sufficiently addressed by physical fitness alone. To enhance general well-being and operational effectiveness, a comprehensive strategy that includes psychological support services, sleep health therapies, stress management programs, and continuous mental health screening may be required.

Limitations

This study had some limitations, including a small sample size and the use of non-probability convenience sampling, which limits generalizability. The data collection involved the use of self-reported questionnaires so it may introduce recall bias. The females in the study were only 9.2% so it may introduce gender bias. Many other confounding factors like caffeine intake, alcohol consumption, and smoking were not evaluated.

Conclusion

217 active-duty Pakistan Navy personnel, with a mean age category of 1.94 ± 0.848, were included in the study; 90.8% of the sample was male. 75.1% of individuals reported poor sleep quality, mostly mild, and 39.6% experienced severe psychological distress. 88.4% of people were moderately to highly active, indicating high levels of physical activity. There were statistically significant correlations between psychological distress and both physical activity ($p < 0.016$) and sleep quality ($p < 0.001$). Physical activity and sleep quality did not

significantly correlate ($p > 0.057$). Despite their normally high levels of physical activity, our results revealed that naval personnel usually experience a high psychological distress and sleep disturbance. For relationships involving psychological distress, the findings are consistent with rejecting the null hypothesis.

Authors' Contributions:
AM: conception, study design, data collection and acquisition, manuscript writing**.**
RAH: Research supervision, data interpretation, formatting and quality assurance.
OA: Administrative support, Final manuscript approval.
Conflict of interest: Non to declare.
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References:

1. Agorastos A, Chrousos GP. The neuroendocrinology of stress: the stress-related continuum of chronic disease development. *Mol Psychiatry*. 2022; 27(1):502-513. Doi: 10.1038/s41380-021-01224-9.

2. World Health Organization. Mental health and substance use [Internet]. Geneva: WHO; 2022 [cited 2024 Jun 10]. Available from: https://www.who.int/teams/mental-health-and-substance-use

3. Hoge CW, Castro CA, Messer SC, McGurk D, Cotting DI, Koffman RL. Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. N Engl J Med. 2004; 351(1):13-22.

4. Myllylä M, Kyröläinen H, Ojanen T, Ruohola JP, Heinonen OJ, Simola P, et al. The effects of individual characteristics of the naval personnel on sleepiness and stress during two different watch keeping schedules. *Int J Environ Res Public Health*. 2022

5. Saguin E, Gomez-Merino D, Sauvet F, Leger D, Chennaoui M. Sleep and PTSD in the military forces: a reciprocal relationship and a psychiatric approach. *Brain Sci*. 2021; 11(10):1310.

6. Kiamanesh P, Mohammadi A, Maghsoudi A, Shariat SV, Haghdoost AA. The global prevalence of depression, suicide ideation, and attempts in the military forces: a systematic review and meta-analysis of cross sectional studies. *BMC Psychiatry*. 2021; 21(1):510.

7. Lee JH, Kim HR, Lee HE. Support from superiors reduces depression in Republic of Korea military officers. *BMJ Mil Health*. 2021; 167(6):378-383.
8. Peixoto EM, Zanini DS, de Andrade JM. Cross-cultural adaptation and psychometric properties of the Kessler Distress Scale (K10): an application of the rating scale model. *Psicol Reflex Crit*. 2021; 34(1):21.

9. Saguin E, Gomez-Merino D, Sauvet F, Leger D, Chennaoui M. Sleep and PTSD in the military forces: a reciprocal relationship and a psychiatric approach. *Brain Sci*. 2021; 11(10):1310.

10. Belenky G, Wesensten NJ, Thorne DR, Thomas ML, Sing HC, Redmond DP, et al. Patterns of performance degradation and restoration during sleep restriction and subsequent recovery: implications for military operational readiness. *Sleep Health*. 2020; 6(2):123-130.

11. Bulmer S, Aisbett B, Drain JR, Roberts S, Gusting PB, Tait J, et al. Sleep of recruits throughout basic military training and its relationships with stress, recovery, and fatigue. *International Archives of Occupational and EnvironmentalHealth*.2022
12. Petrofsky LA, Heffernan CM, Gregg BT, Smith-Forbes EV. Effects of sleep deprivation in military service members on cognitive performance: a systematicreview.*MilitaryBehavioralHealth*.2021;10(3):202-220.
13. Taylor DJ, Pruiksma KE, Hale WJ, Kelly K, Maurer D, Peterson AL, et al. Prevalence, correlates, and predictors of insomnia in the U.S. Army prior to deployment.*Sleep*.2016;39(10):1795–1806.

14. Bai W, Gui Z, and Chen MY, et al. Global prevalence of poor sleep quality in military personnel and veterans: a systematic review and meta-analysis. *SleepMedicineReviews*.2023; 71:101840.

15. Mysliwiec V, Walter RJ, Collen JF, Wesensten NJ. Military sleep management: an operational imperative. *US Army Medical Department Journal*. 2016 ;(2–16):128–134.

16. Grandner MA, et al. Sleep health and military readiness: impacts of operational stress, shift work, and sleep restriction. *Sleep Health*. 2022; 8(5):469–478.

17. Carpi M. The Pittsburgh Sleep Quality Index: a brief review. Occupational Medicine (Oxford). 2025; 75(1):14–15.

18. The World Health Organization (WHO) defines PA as "any bodily movement produced by skeletal muscles that requires energy expenditure"

19. Noetel M, et al. Effect of exercise for depression: systematic review and networkmeta-analysis.*BMJ*.2024; 384:e075847.

20. Gerhardt C, Semmer NK, Sauter S, et al. How are social stressors at work related to well-being and health? A systematic review and meta-analysis. *BMC Public Health*. 2021; 21:890.

21. Hu D, Xie P, Xia L, Hou H, Wang H, Zheng X, et al. The associations between sedentary behavior and risk of depression: systematic review and dose–response meta-analysis. *BMC Public Health*. 2025; 25:2254.

22. Pawar AA, Rathod J. Occupational stress in naval personnel. Med J Armed Forces India. 2007; 63(2):154-156. Doi: 10.1016/S037(07)80062-1

23. Brooks SK, Greenberg N. Mental health and psychological wellbeing of maritime personnel: a systematic review. BMC Pschycol. 2022; 10(1):139. doi:10.1186/s40359-022-00850-

24. Sargent C, Gebruers C, O'Mahony J. A review of the physiological and psychological health and wellbeing of naval service personnel and the modalities used for monitoring. *Mil Med Res*. 2017; 4:1. doi:10.1186/s40779-016-0112-3

25. Brooks SK, Greenberg N. Non-deployment factors affecting psychological wellbeing in military personnel: literature review. *J Ment Health*. 2018; 27(1):80-90. doi:10.1080/09638237.2016.1276536.

26. Harrison EM, Easterling AP, Schmied EA, Hurtado SL, Glickman GL. Chronotype and self-reported sleep, alertness, and mental health in U.S. sailors. *Mil Med Res*. 2021; 8(1):43. Doi: 10.1186/s40779-021-00335-2.

27. Bai W, Gui Z, Chen MY, Zhang Q, Lam MI, Si TL, et al. Global prevalence of poor sleep quality in military personnel and veterans: a systematic review and meta-analysis of epidemiological studies. *Sleep Med Rev*. 2023; 71:101840. doi:10.1016/j.smrv.2023.101840.

28. Russell DW, Markwald RR, Jameson JT. Self-reported sleep and sleep deficiency: Results from a large initiative of sailors attached to U.S. Navy warships. *J Sleep Res*. 2021; 30(6):e13397. doi:10.1111/jsr.13397.

29. Stults-Kolehmainen MA, Sinha R. The effects of stress on physical activity and exercise. *Sports Med*. 2014; 44(1):81-121. doi:10.1007/s40279-013-0090-5