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EDITORIAL

Israel–Palestine Conflict: Risk of Sleep Disorders and Post-Traumatic Stress Disorders

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This special editorial focuses on potential sleep disturbances and Post-Traumatic Stress Disorder (PTSD) in the context of the Israeli–Palestinian conflict. This editorial might also be seen as a part of our civic obligation as a scientific publication, particularly one that represents a scientific society (The Indian Society for Sleep Research or ISSR) to inform political decision-makers about the effects of armed conflicts in today's world on the mental health of wide swaths of the world's population [1]. Conducting wars is about settling disputes, but it is also about creating better futures, and thus, belligerents need to be fully aware of the consequences of modern warfare [2]. We are currently seeing a fresh, deadly wave of violence, this time sparked by terrorist operations carried out by Hamas, a political and military group in charge of governing the Gaza Strip of the Palestinian territories.

Israelis and Palestinians have been in a state of political and military turmoil since the declaration of the State of Israel and the ensuing war and 'Nakba,' or disaster, in 1948. Thousands of people have been killed in acts of political violence, on both sides.

Everyone exposed to war knows that it is not only the fighting force that is traumatized but the civilian population, as well as people living within or close to the war zone. This risk is amplified by the recent gamification of war which is increasingly remote-controlled and conducted via aerial assaults. It is further amplified when military forces are located in civilian areas. All well-being indicators rise during the bombardment, namely spikes in heart rate, hikes of screen-on time, and reductions in sleep parameters, both of quality and quantity. Greater changes are observed in vulnerable individuals living close to the battlefield. This includes women, the elderly, and youth [3].

Studies indicate that people with continued sleep disturbance is more vulnerable to other symptoms of post-traumatic stress (PTSD), such as fear, anxiety, nightmares, and heightened arousal [4]. Sleep has many major physiological roles linked to risk pathways for mental and physical health, including memory consolidation, emotional regulation, cognitive function, energy conservation, hormonal regulation, immune function, clearing of metabolic waste, body weight regulation, and cellular repair and growth. In this context, poor sleep often leads to slow reaction time, trouble with learning and memory, irritability and mood problems, trouble with thinking and concentration, suicidal ideation, or self-harm behavior. There is evidence that chronic sleep disturbance potentially leads to greater risk for medical and mental dysfunctions such as heart disease, kidney disease, high blood pressure, diabetes, obesity, stroke, and depression [5]. Sleep disturbances are a challenge for clinicians who treat traumatized individuals in war-affected regions. Sleep fragmentation, which is seen in residents of war-affected areas, is a risk factor for chronic PTSD. Studies on soldiers have pointed out the central role of degraded sleep in the development of chronic PTSD. Given that rapid eye movement (REM) sleep is often linked to emotional memory, it

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has been hypothesized that REM sleep fragmentation is a likely contributor to the emergence of PTSD symptoms [6].

Several studies show the long-term effects of war among Gulf War veterans. Gulf War illness (GWI) is a multi-symptom condition that has been identified in servicemen and servicewomen in the 1990–1991 Gulf War (GW). This condition is characterized by multiple concurrent symptoms such as persistent headaches, cognitive difficulties, widespread pain, fatigue, gastrointestinal problems, and a variety of other chronic abnormalities. One of the most common symptoms of GWI is sleep disturbance. GWI is estimated to affect at least one-fourth of the 697,000 US GW veterans [7]. 76% of military personnel are unable to achieve the adult recommended minimum of 7 h of sleep. This is a very high percentage as compared to the 37% of the United States civilian population who fall into this category. Service members have difficulty achieving adequate sleep duration for a variety of reasons, including the stressful (and often dangerous) nature of deployment and training, co-morbid conditions, such as PTSD, jet lag from frequent displacement, and the demands of the military culture [8]. Veterans with GWI are at risk for obstructive sleep apnea (OSA). They also suffer from insomnia and generally poor sleep quality [9]. Although the etiology of GWI remains uncertain, several studies have provided strong evidence that chemical exposures, especially to neurotoxins, maybe one major underlying cause [10].

Several studies have addressed the long-lasting adverse effects of previous recent wars. The bombings of Hiroshima and Nagasaki, for instance, saw a surge in sleep disorders, and PTSD, and resulted in an overall deterioration in Japanese mental health [11–13]. It is not to be forgotten that the world faces a global rise in youth mental health problems and a population that is aging and, consequently, fragile [14]. The impact of war is greatest on vulnerable populations, which include women, children, and the elderly.

Despite indicators that show a higher prevalence of sleep disturbance in most war zone populations, the results of a study among soldiers in Israel are inconsistent with this generalization [15, 16]. The Israel Defense Forces Medical Corps Mental Health Department on PTSD has claimed that the rate of PTSD among Israeli soldiers is among the lowest in military forces worldwide. The authors of the study explain this by the fact that no one in Israel is untouched by terrorism so Israeli soldiers, as the rest of Israeli society, have in some ways been immunized against trauma [17]. Nevertheless, several Israeli companies and labs are working on high-tech solutions to sleep disorders, including insomnia and sleep apnea [18]. In addition, comparing vulnerability to continuous terror between Jewish and Arab Israelis showed that "after 19 months of terrorist attacks Arab Israelis and Jewish Israelis reacted roughly similarly to the situation, however, after 44 months of terror, posttraumatic stress disorder in the Arab population increased threefold, posttraumatic symptomatology doubled and resiliency almost disappeared [19]. Predictors of stronger resistance and resilience trajectories among Jewish Israelis are related to less psychosocial resource loss, greater socioeconomic status, and greater support from friends [20].

A study of sleep quality and behaviors of Palestinian adults in the Gaza Strip shows that they, on the other hand, report poor sleep quality, excessive daytime sleepiness, severe depression, and a low health-related quality of life. Women and children are most affected. The authors (from Tunisia) claim that the conflictual situation in the Gaza Strip, combined with high population density and poor socio-economic conditions, may play an important role in sleep disturbances and life quality [21]. A study by scientists from the United Kingdom has shown that the prevalence of PTSD among children and adolescents in the Gaza Strip has increased in recent wars. The majority of the population has experienced personal trauma, witnessed trauma, and observed the recurrent demolition of property. Compared to girls, boys showed significantly more exposure to traumatic events. Unsurprisingly, children who had experienced personal trauma, trauma to others, and the destruction of property were significantly more likely to be diagnosed with PTSD compared to those who had not [22]. Furthermore, sleep problems may confer vulnerability to long-term distress in the presence of ongoing political violence [4].

A literature review of anxiety disorders and PTSD in Palestine by Palestinian scientists has shown that anxiety disorders and PTSD are common mental disorders in their population. Risk factors for anxiety and PTSD consist of individual genetics, learned personality traits, and exposure to life events. In addition, a significant proportion of Palestinians experience the ill effects of a badly functioning medical system—inconsistent availability of medications, absence of multidisciplinary teamwork, insufficient numbers of specialists, fragmentation of services, and recurrent wars [23]. Despite the problems encountered in Gaza, a Palestinian study published in 2011 found that, on the whole, the degree of sleep problems was comparable to that reported in European studies [24].

Like all wars, Israeli−Palestinian conflicts are associated with large-scale migrations and refugees escaping to host countries. This mainly affects Palestinians who, though escape routes are limited, do have a choice of a wide array of potential host countries whose cultures and traditions are similar to their own. Nevertheless, sleep disorders are very common among migrants and refugees and they are linked to mental health disturbances, especially PTSD [25].

As the present Israel−Hamas war continues, people far away from the conflict zone are exposed to countless images, stories, and sounds of conflict via television, radio, newspapers, and social media. Visual imagery lingers in the

memory and is more damaging and long-lasting than spoken words [26]. Thus, sleep and mental health are likely to be impacted also in other countries around the world.

The COVID-19 epidemic has caused a marked rise in global mortality rates and presented an unparalleled and disastrous threat to humankind. Subsequently, the repercussions of the conflict between Russia and Ukraine also reverberate around the world.

The globe is still changing as a result of the Russia−Ukraine war. The ripple effects are felt worldwide in addition to in their immediate neighborhood. Along with the impact on public health, other notable effects include those on the workforce, the humanitarian crisis, changes in the energy market, increased strain on the food system and supply chain, social capital, the global economy, and geopolitical and economic instability. It will also result in environmental deterioration and climatic change. Slower growth and faster inflation have affected the whole world economy.

The conflicts will certainly have broader ramifications, even while the exact long-term implications are yet unclear. Wide-ranging impacts of war eventually harm the economy and result in economic fallout. In the years to come, all of these will have a lasting effect on society. History tells us that there have always been wars, but that does not mean that nothing can be done to stop them. We hope that a way to maintain the peace can be found.

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References

1. Carpiniello B. The mental health costs of armed conflicts—a review of systematic reviews conducted on refugees, asylum-seekers and people living in war zones. Int J Environ Res Public Health. 2023. https://doi.org/10.3390/ijerph20042840.
2. Pandi-Perumal SR, Kumar VM, Pandian NG, de Jong JT, Andiappan S, Corlateanu A, Mahalaksmi AM, Chidambaram SB, Kumar RR, Ramasubramanian C, et al. Scientists against war: a plea to world leaders for better governance. Sleep Vigil. 2022;6:1–6. https://doi.org/10.1007/s41782-022-00198-0.
3. Mofaz M, Yechezkel M, Einat H, Kronfeld-Schor N, Yamin D, Shmueli E. Real-time sensing of war's effects on wellbeing with smartphones and smartwatches. Commun Med. 2023;3:1–11. https://doi.org/10.1038/s43856-023-00284-y.
4. Gerhart JI, Hall BJ, Russ EU, Canetti D, Hobfoll SE. Sleep Disturbances Predict Later Trauma-Related Distress: Cross-Panel Investigation amidst Violent Turmoil. Health Psychol. 2014;33:365–72. https://doi.org/10.1037/a0032572.
5. VA.Gov. Veterans affairs. 2023. https://www.ptsd.va.gov/understand/related/sleep_problems.asp. Accessed 03 Nov 2023.
6. 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. https://doi.org/10.3390/brainsci11101310.
7. RAC2014.Pdf.
8. The Military and Sleep. 2023. https://www.sleepfoundation.org/sleep-in-the-military. Accessed 03 Nov 2023.
9. Chao LL, Abadjian LR, Esparza IL, Reeb R. Insomnia severity, subjective sleep quality, and risk for obstructive sleep Apnea in veterans with gulf war illness. Mil Med. 2016;181:1127–34. https://doi.org/10.7205/MILMED-D-15-00474.
10. Elhaj R, Reynolds JM. Chemical exposures and suspected impact on gulf war veterans. Mil Med Res. 2023;10:11. https://doi.org/10.1186/s40779-023-00449-9.
11. Kim Y, Tsutsumi A, Izutsu T, Kawamura N, Miyazaki T, Kikkawa T. Persistent distress after psychological exposure to the nagasaki atomic bomb explosion. Br J Psychiatry. 2011;199:411–6. https://doi.org/10.1192/bjp.bp.110.085472.
12. Khazaie H, Ghadami MR, Masoudi M. Sleep disturbances in veterans with chronic war-induced PTSD. J Inj Violence Res. 2016;8:99–107. https://doi.org/10.5249/jivr.v8i2.808.
13. Lurie I. Sleep disorders among holocaust survivors: a review of selected publications. J Nerv Ment Dis. 2017;205:665–71. https://doi.org/10.1097/NMD.0000000000000717.
14. Gulia KK, Kumar VM. Sleep disorders in the elderly: a growing challenge. Psychogeriatrics. 2018;18:155–65. https://doi.org/10.1111/psyg.12319.
15 Futnd N, Green A, Chodick G, Orin M, Koren G, Shalev V, Dagan Y. The epidemiology of sleep disorders in israel: results from a population-wide study. Sleep Med. 2020;67:120–7. https://doi.org/10.1016/j.sleep.2019.10.010.
16. Hobfoll SE, Canetti-Nisim D, Johnson RJ, Palmieri PA, Varley JD, Galea S. The association of exposure, risk, and resiliency factors with ptsd among jews and arabs exposed to repeated acts of terrorism in Israel. J Trauma Stress. 2008;21:9–21. https://doi.org/10.1002/jts.20307.
17. Solomon AB. Why Do Israeli Soldiers Suffer from PTSD Less than American Counterparts?. 2023. https://www.jns.org/why-do-israeli-soldiers-suffer-from-ptsd-less-than-american-counterparts/. Accessed 03 Nov 2023.
18. Constantinoiu M. Israeli solutions to help you sleep soundly during difficult times. 2023. https://www.israel21c.org/israeli-solutions-to-help-you-sleep-soundly-during-difficult-times/. Accessed 03 Nov 2023.
19. Gelkopf M, Solomon Z, Berger R, Bleich A. The mental health impact of terrorism in Israel: a repeat cross-sectional study of Arabs and Jews. Acta Psychiatr Scand. 2008;117:369–80. https://doi.org/10.1111/j.1600-0447.2008.01164.x.

20. Msaad S, Ketata N, Fidha S, Gargouri R, Talaa HA, Wadhane I, Kallel N, Bahloul N, Feki W, Jedidi J, et al. Sleep habits and quality among war and conflict-affected Palestinian adults in the Gaza strip. Sleep Med. 2023;102:90–104. https://doi.org/10.1016/j.sleep.2022.12.025.
21. Hobfoll SE, Palmieri PA, Johnson RJ, Canetti-Nisim D, Hall BJ, Galea S. Trajectories of resilience, resistance, and distress during ongoing terrorism: the case of Jews and Arabs in Israel. J Consult Clin Psychol. 2009;77:138. https://doi.org/10.1037/a0014360.
22. Sweileh WM, Ali IA, Sawalha AF, Abu-Taha AS, Zyoud SH, Al-Jabi SW. Sleep habits and sleep problems among Palestinian students. Child Adolesc Psychiatry Ment Health. 2011;5:25. https://doi.org/10.1186/1753-2000-5-25.
23. El-Khodary B, Samara M, Askew C. Traumatic events and PTSD among Palestinian children and adolescents: the effect of demographic and socioeconomic factors. Front Psychiatry. 2020;11:4. https://doi.org/10.3389/fpsyt.2020.00004.
24. Marie M, SaadAdeen S, Battat M. Anxiety disorders and PTSD in Palestine: a literature review. BMC Psychiatry. 2020;20:509. https://doi.org/10.1186/s12888-020-02911-7.
25. Richter K, Baumgärtner L, Niklewski G, Peter L, Köck M, Kellner S, Hillemacher T, Büttner-Teleaga A. Sleep disorders in migrants and refugees: a systematic review with implications for personalized medical approach. EPMA J. 2020;11:251–60. https://doi.org/10.1007/s13167-020-00205-2.
26. Kane A. CNN how to protect your mental health while keeping tabs on the Israel-Hamas war. 2023. https://www.cnn.com/2023/10/14/health/mental-health-israel-hamas-wellness/index.html. Accessed 03 Nov 2023.

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