



Anxiety symptoms, sleep disturbance, and academic achievement among Afghan female school students: A cross-sectional study

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ABSTRACT

Background: Anxiety is a common psychological disorder in school-aged children and adolescents. The present study aimed to assess the prevalence of anxiety symptoms and sleep disturbances and their relationship with academic achievement among female students in Herat, Afghanistan.

Methods: A cross-sectional survey of 737 female students (mean age 11.8 years old) was conducted across 10 randomly selected schools in Herat, Afghanistan, covering Grades 1 to 6. Students were randomly chosen within these schools. The Depression Anxiety Stress Scale for Youth (DASS-Y) and Pittsburgh Sleep Quality Index (PSQI) assessed anxiety and sleep disturbance, while academic achievement ratings were provided by schoolteachers.

Results: Using the DASS-Y and the PSQI, 65.5% reported anxiety symptoms and 46.4% reported sleep disturbance. Low academic achievement correlated significantly with anxiety ($r = 0.228$) and sleep issues ($r = 0.161$). Multiple logistic regression analysis identified predictors for anxiety and sleep disturbance. Predictors for anxiety included being aged 13–16 years, having lower class grade, being of low economic status, and having unemployed parents. Predictors for sleep disturbance included being aged 13–16 years, having lower class grade, having an uneducated father, being of low economic status, and having unemployed parents.

Conclusion: There is a high prevalence of anxiety symptoms and sleep disturbances among female school students in Herat, Afghanistan. Significant correlations exist between students' academic achievement, anxiety, and sleep disturbances. Addressing anxiety and sleep disturbances among Afghan female school students could be facilitated by revising current government policies concerning students' health. Educational campaigns focused on sleep hygiene and anxiety management for both students and their parents may also prove beneficial.

Introduction

Experiencing poor emotional mood states like anxiety and depression is a global concern [1]. Anxiety is one of the most common psychological disorders among school-aged children and adolescents [2]. Anxiety is reported internationally among children and adolescents in many countries, including Australia [3], India [4], Greece, Russia, and China [5]. A systematic review of 48 studies involving 40 countries and 56,816 university students reported a prevalence of 24.5% for anxiety,

26.1% for depression, and 18.8% for suicidal ideation [6].

In addition to impairing overall health and well-being, depression and anxiety symptoms can adversely affect academic achievement [7]. Some cross-sectional studies have reported that more anxious students have poorer academic achievement [8,9]. Nonetheless, that association may reflect students' concerns about their academic studies because longitudinal studies have not shown a predictive association between anxiety and decreased academic achievement [10]. In fact, there are some studies suggesting that increased anxiety may be associated with

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better academic achievement [11].

There is an association between good sleep and the consolidation of cognitive performance, which is crucial for executive functioning including abstract reasoning, goal-directed behavior, and creative processing [12,13]. Sleep-related overnight brain processes are assumed to affect cognitive, physical, and emotional performance during the day [14,15]. A probable explanation for the association between sleep, cognitive performance, and school performance is based on the idea that reduced or disrupted sleep decreases necessary overnight brain activity that is required for neurocognitive functioning. Complex tasks that require abstract thinking, creativity, integration, and planning can be negatively influenced by sleep-related problems [16]. These tasks, that represent higher order neurocognitive functioning, are all characterized by the involvement of prefrontal cortex, which is sensitive to sleep [12, 17]. Therefore, it is suggested that reduced or disrupted sleep during adolescence impairs the executive functioning of the prefrontal cortex [18] and subsequently decreases learning abilities and academic achievement [19,20].

Sleep is crucial for learning, memory processes, and school performance of children and adolescents. Some studies have concluded that poor sleep, increased sleep fragmentation, late bedtimes, and early awakenings seriously affect neurobehavioral functioning, learning capacity, and school performance [12,14,21]. Commonly, problems with initiating and maintaining sleep are common among children and adolescents which can be an indicative of poor sleep quality. Prevalence of these problems range from 11%–47% [22,23]. Empirical evidence shows that adolescents should regularly sleep 8–10 h (average 9 h) per night to promote an adequate health and performance [24]. However, studies have shown that less than half of children and adolescents sleep less than 8 h per night [25,26]. Insufficient sleep might be due to an interaction of intrinsic factors (e.g., puberty, circadian or homeostatic changes) and extrinsic factors (e.g., early school start times, social pressure, academic workload) leading to late bedtimes while waking-up times remain unchanged.

A study conducted in Afghanistan (where the present study was carried out) with 295 faculty of education university students. Of these, 4.1% had anxiety/insomnia and 19.3% had severe depression (using the General Health Questionnaire). There were no significant association between academic achievement and anxiety, insomnia or severe depression [27].

Since the Taliban returned to government in Afghanistan, girls have been banned from going to school (above Grade 6) and university. These restrictions have impacted girls' mental health. For example, a study among Afghan women in urban areas under the Taliban government showed that 81.0% of the Afghan women had anxiety symptoms [28]. A study among Talibs (mosque students) in Afghanistan reported that the prevalence of anxiety was 47.9% and sleep disturbance was present among 29.1% [29]. There is no research on the interplay between academic achievements, anxiety symptoms, and sleep disturbances among Afghan female students, particularly in the unique sociocultural context of Afghanistan. Therefore, the main objectives of the present study were to estimate the prevalence of anxiety symptoms and sleep disturbance and their association with academic achievement among female school student in Herat, Afghanistan. As the study was exploratory, there were no hypotheses.

Materials and methods

Study participants, study design, and sample size calculation

A cross-sectional study was carried out in 10 randomly selected public schools in Herat province, Afghanistan, from a total of more than 100 schools registered with the Herat Education Department. The selection of the 10 schools was based on a lottery method, and students were randomly chosen from 1 to 6 classes within the selected schools. The study was conducted between April and June 2023 with female

students enrolled in the first six grades within public schools in Herat city, Afghanistan. A total of 737 participants were recruited, and data were collected through face-to-face interviews conducted by trained data collectors. The data collectors were specifically trained for this study to ask questions and accurately record responses from the participants without influencing their answers. To collect data on psychological issues from approximately 8-year-old girls, we implemented child-friendly methods to ensure accurate reporting. The data collectors received specialized training in interviewing techniques suitable for young children, focusing on creating a comfortable and non-intimidating environment. Age-appropriate language and questions were used to facilitate understanding, and efforts were made to minimize bias by ensuring that the interview process was neutral and non-directive. Eligibility criteria included being a student at a public school, being below 18 years of age, possessing proficiency in the Dari language, and securing written assent form from students as well as consent forms from their parents or guardians. The determination of the desired sample size followed the formula $N = Z\alpha^2P(1 - P)/d^2$, with a significance level (α) of 0.05 and $Z\alpha$ value of 1.96. The acceptable margin of error for the proportion, denoted as 'd,' was set at 5%. Drawing upon existing literature, the estimated proportion of females experiencing anxiety was established at 50% [29]. The calculation of the sample size was executed using OpenEpi software (v3.01). The study deemed a minimum sample size of 385 participants as requisite. Nevertheless, to mitigate potential errors, data collection endeavors surpassed this threshold, yielding a sample size nearly twice the stipulated minimum.

Instruments

The survey comprised three sub-sections, namely socio-demographics, anxiety, sleep disturbance, and academic class grading. The socio-demographic section included questions regarding age, residency (urban, rural), father's education (illiterate, school, university), mother's education (illiterate, school, university), economic status (high income [more than \$100 per month], middle income [less than \$100 and more than \$50 per month], low income [less than \$50 per month]), and parental employment (employed, unemployed). The participants' academic class grades were provided by the participants' school teachers with options ranging from A to F. Students with F grades were typically new to the class. In order to decrease the chances of differences being due to a change in class, those students with F grades were excluded from the analysis. Grades were converted into a numerical score where Grade A scored 1 and Grade E scored 5.

To assess anxiety symptoms, the Persian version of the 21-item Depression Anxiety Stress Scale for Youth (DASS-Y) [30–31] was used. The scale was developed to assess psychological distress among children and adolescents, and comprises three 7-item subscales (depression, anxiety, and stress). Items (e.g., "I was worried about situations in which I might panic and make a fool of myself") are rated on a scale from 0 (Not true) to 3 (Very true). In the present study, only the anxiety subscale was used. Anxiety scores are derived by multiplying the DASS-21 scores by 2 to simulate DASS-42, ranging from 0 to 42. A standard cut-off score was applied, with a range of 0 to 7 considered normal and a score above 8 being indicative of anxiety symptoms. The internal consistency of the anxiety subscale in the present study was very good (Cronbach's alpha = 0.853).

To assess sleep disturbance, the 19-item Pittsburgh Sleep Quality Index (PSQI) [32] Persian version [33] was used. The 19 items comprise seven components (subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction). Items (e.g., "Cannot get to sleep within 30 minutes") are rated on a scale from 0 (not during the past month) to 3 (three or more times a week). The global score, ranging from 0 ("indicating no difficulty") to 21 ("indicating severe difficulty in all components") is obtained by summing scores across the seven components. A cumulative score of 5 or

lower indicates favorable sleep quality, while a score exceeding 5 suggests inadequate or poor sleep quality. The internal consistency of the PSQI in the present study was very good (Cronbach's alpha = 0.823).

Data analysis

The data were initially entered and organized using Microsoft Excel 2016 to ensure precision and uniformity. Subsequent statistical analyses were conducted by using Statistical Package for the Social Sciences (SPSS) version 26 (Armonk, NY, USA). Preliminary data analysis involved descriptive statistics, encompassing the calculation of means, standard deviations, frequencies, and percentages. Correlation between class grading, anxiety, and sleep disturbance were investigated through bivariate correlation, aiming to identify potential relationships. To assess the impact of socio-demographic factors, anxiety, sleep disturbances, and the correlation of class grading on the targeted outcomes, a multivariable logistic regression model was implemented. Factors such as age, gender, income, and education level have been consistently associated with mental health outcomes. Therefore, these variables were included in this regression model. This model allowed for the simultaneous evaluation of multiple predictors and their potential confounding effects. Results derived from the regression model were presented as odds ratios (OR) accompanied by corresponding 95% confidence intervals (CIs) to quantify the strength and direction of associations. A two-tailed *p*-value threshold of 0.05 was established as the criterion for determining statistical significance in the analyses.

Results

A total of 737 adolescent school-going girls participated whose ages ranged from 8 to 16 years (mean age = 11.8 years; SD±1.11). More than one-third of the participants' fathers were illiterate (34.9%) while nearly a half of their mothers were illiterate (48.6%). Only 1.8% of the participants lived in rural areas. More than half of the participants reported being in Grade A in their class (54%). Almost two-thirds of the

Table 1
Main characteristics of the study participants (*n* = 737 girls).

Characteristic	Categories	Number (N)	Percentage (%)
Age group	8–12 years	567	76.9
	13–16 years	170	23.1
Residency	Urban	724	98.2
	Rural	13	1.8
Father's education	Illiterate	257	34.9
	Literate (school graduate)	378	51.3
	Literate (university graduate)	102	13.8
Mother's education	Illiterate	358	48.6
	Literate (school graduate)	309	41.9
	Literate (university graduate)	70	9.5
Family economic status	High income	86	11.7
	Middle income	480	65.1
	Low income	171	23.2
Parents' employment	Employed	480	65.1
	Unemployed	257	34.9
Class grading	Grade A	398	54.017.8
	Grade B	131	
	Grade C	115	15.6
	Grade D	4	0.5
	Grade E	89	12.1
DASS-Y anxiety score	Normal	254	34.5
	Anxiety symptoms present	483	65.5
PSQI score	Sleeping disturbance absent	395	53.6
	Sleeping disturbance present	342	46.4
Total		737	100

participants reported symptoms of anxiety (65.5%) while less than half reported sleep disturbance (46.4%) (Table 1).

There was a strong correlation of class grading (academic achievement) with anxiety ($r = 0.228, p < 0.001$) and class sleep disturbance ($r = 0.161, p < 0.001$). Anxiety and sleep disturbance were also strongly correlated ($r = 0.547, p < 0.001$).

More than three-quarters of the participants aged 13–16 years were found to have anxiety symptoms (75.9%). More than nine-tenths of the participants living in rural areas had anxiety symptoms (92.3%). More than eight-tenths of the participants with Grade E academic achievement had anxiety symptoms (83.1%). There was a significant relationship between presence of anxiety and (i) being older (aged 13–16 years), (ii) living in rural area, (iii) having an illiterate father, (iv) having an illiterate mother, (v) having low economic status, (vi) having unemployed parents, and (vii) having low academic achievement/class grade.

More than half of the participants aged 13–16 years had sleep disturbance (58.2%). Almost two-thirds of the participants having low-income economic status had sleep disturbance (64.3%). More than half of the study participants having parents who were unemployed had sleep disturbance (56.8%). Less than two-thirds of the participants with class grade E academic achievement had sleep disturbance. There was statistically significant relationship between sleep disturbance and (i) being older (aged 13–16 years), (ii) having lower economic status, (iii) having unemployed parents, and (iv) having lower class grade (Table 2).

Multiple logistic regression analysis was conducted to see which variables predicted presence of anxiety and sleep disturbance (poor sleep quality). The significant predictors of anxiety symptoms were being aged 13–16 years (OR 0.9, 95% CI 0.7–1.0, $p = 0.048$), having lower class grade (OR 0.7, 95% CI 0.6–0.8; $p < 0.001$), having low economic status (OR 1.9, 95% CI 1.0–3.0; $p = 0.040$), and having unemployed parents (OR 1.6, 95% CI 1.1–2.4; $p = 0.012$). The significant predictors of sleep disturbance were being aged 13–16 years (OR 0.8, 95% CI 0.7–1.0; $p = 0.017$), having lower class grade (OR 0.8, 95% CI 0.7–0.9; $p = 0.003$), having an uneducated father (OR 1.7, 95% CI 1.0–2.7; $p = 0.035$), having low economic status (OR 2.0, 95% CI 1.4–3.0; $p < 0.001$), and having unemployed parents (OR 1.5, 95% CI 1.1–2.1; $p = 0.019$) (Table 3).

Discussion

In the present study, the prevalence of anxiety symptoms among Afghan schoolgirls was 65.5%. A similar prevalence of anxiety has been reported in studies conducted among university students in Pakistan (53.2%) [34], and a systematic review in Iran (6.8%–85.0%) [35]. Compared to the present study, a lower prevalence of anxiety was reported in studies conducted among school students in Egypt (6.7%) [36], Malaysia (39.7%) [37], and India (17.9%) [38], France (32.7%) [39], South Africa (32.0%) [40], Nigeria (10.3%) [41], China (24.8%) [42], Portugal (6.5%) [43], UAE (28.0%) [44], Sri Lanka (28.0%) [45], Bangladesh (18.1%) [46], Saudi Arabia (34.2%–65.0%) [47], and Turkey (42.0%) [48]. A higher prevalence of anxiety has been reported in studies among university students conducted in Iran (85.0%) [49], Lebanon (73.2%) [50], and Northwest Ethiopia (66.7%) [51]. A systematic review and meta-analysis reported that globally, 34.8% of graduate students suffer from anxiety (95% CI: 29.5–40.5%). Among these students, 19.1% had mild anxiety (95% CI: 15.4–23.5%), 15.1% had moderate anxiety (95% C: 11.6–19.6%), and 10.3% had severe anxiety (95% CI: 7.2–14.6%) [52]. The prevalence differences in studies might be because the present study was carried out among female school children whereas other studies were among both genders and used different diagnostic scales (e.g., DASS-21, DASS-42, CHQ-28, DSM-IV, or GAD-7) and cut-off points for assessing anxiety were also different across studies. The differences could also be due to students being in different levels of education or different study subjects.

In the present study, the prevalence of sleep disturbance among students was 46.4%. In different studies around the world, the

Table 2
Association of socio-demographic characteristics with anxiety symptoms and sleep disturbance (poor sleep quality) among study participants (n = 737 girls).

Characteristic	Categories	Anxiety symptoms		p-value	Sleep Disturbance		p-value
		Absent N (%)	Present N (%)		Absent N (%)	Present N (%)	
Age group	8–12 years	213 (37.6)	354 (62.4)	0.001	324 (57.1)	243 (42.9)	<0.001
	13–16 years	41 (24.1)	129 (75.9)		71 (41.8)	99 (58.2)	
Residency	Urban	253 (34.9)	471 (65.1)	0.040	390 (53.9)	334 (46.1)	0.270
	Rural	1 (7.7)	12 (92.3)		5 (38.5)	8 (61.5)	
Father's education	Illiterate	78 (30.4)	179 (69.6)	0.010	127 (49.4)	130 (50.6)	0.075
	School	128 (33.9)	250 (66.1)		218 (57.7)	160 (42.3)	
Mother's education	University	48 (47.1)	54 (52.9)	0.006	50 (49.0)	52 (51.0)	0.215
	Illiterate	109 (30.4)	249 (69.6)		182 (50.8)	176 (49.2)	
Economic status	School	110 (35.6)	199 (64.4)	0.001	170 (55.0)	139 (45.0)	<0.001
	University	35 (50.0)	35 (50.0)		43 (61.4)	27 (38.6)	
Parent's employment	High income	39 (45.3)	47 (54.7)	<0.001	50 (58.1)	36 (41.9)	<0.001
	Middle income	175 (36.5)	305 (63.5)		284 (59.2)	196 (40.8)	
Class grading	Low income	40 (23.4)	131 (76.6)	<0.001	61 (35.7)	110 (64.3)	<0.001
	Employed	189 (39.4)	291 (60.6)		284 (59.2)	196 (40.8)	
Class grading	Unemployed	65 (25.3)	192 (74.7)	<0.001	111 (43.2)	146 (56.8)	<0.001
	Grade A	166 (41.7)	232 (58.3)		233 (58.5)	165 (41.5)	
	Grade B	45 (34.4)	86 (65.6)		79 (60.3)	52 (39.7)	
	Grade C	28 (24.3)	87 (75.7)		47 (40.9)	68 (59.1)	
	Grade D	0 (0.0)	4 (100.0)		2 (50.0)	2 (50.0)	
	Grade E	15 (16.9)	74 (83.1)	34 (38.2)	55 (61.8)		

Table 3
Multivariate regression analysis of anxiety symptoms and sleep disturbance (poor sleep quality) on the characteristics of study participants (n = 737 girls).

Variable	Anxiety symptoms		Sleep disturbance	
	OR (95%CI)	p-value	OR (95%CI)	p-value
Age	0.9 [0.7 – 1.0]	0.048	0.8 [0.7 – 1.0]	0.017
Class grading	0.7 [0.6 – 0.8]	<0.001	0.8 [0.7 – 1.0]	0.003
Father's education				
Illiterate	0.8 [0.5 – 1.4]	0.477	1.7 [1.0 – 2.9]	0.064
School	0.7 [0.4 – 1.1]	0.091	1.7 [1.0 – 2.7]	0.035
Mother's education				
Illiterate	0.7 [0.4 – 1.2]	0.170	0.8 [0.4 – 1.4]	0.410
School	0.7 [0.4 – 1.3]	0.267	0.7 [0.4 – 1.3]	0.296
Economic status				
High income	1.9 [1.03 – 3.0]	0.040	2.0 [1.1 – 3.6]	0.015
Middle income	1.3 [0.8 – 2.1]	0.219	2.0 [1.4 – 3.0]	0.001
Parent's employment				
Employed	1.6 [1.1 – 2.4]	0.012	1.5 [1.1 – 2.1]	0.019

prevalence of sleep disturbance among school children has been reported to be 20%–30% [53–59], which is lower than this study. A lower prevalence of sleep disturbance (poor-sleep quality) has also been reported in studies among school students conducted in New Zealand (37.2%) [60], Malaysia (40.9%) [61], China (16.9%) [62], Hong Kong (19.1%) [63], Brazil (35.3%) [64], Austria (12.0%) [65], Iran (29.7%) [66], and Turkey (14.4%) [67]. However, increased prevalence of sleep disturbance has been reported in studies conducted among school students in Latin-America (61.0%) [68], São Paulo (52.9%) [69], Saudi Arabia (65.0%) [70], Haiti (58.0%) [71], Indonesia (47.8%) [72], and USA (50.2%) [73]. A study among adolescents in European countries reported 25% of the participants had sleep disturbances [74]. These differences of prevalence in different studies could be due to different types of study designs (cross-sectional, cohort, or case-control), different types of study participants, or different sleeping and wake up habits.

The present study also found that there was statistically significant relationship between lower class grade and increased anxiety. Similar results have been reported in studies conducted in Malaysia [75], Taiwan [76], South Africa [77], Finland [78], UK [79–80], Italy [81], Australia [82], and USA [83]. However, some studies have reported that students with moderate levels of anxiety had better academic achievement, including studies in the UK [10] and Jordan [11]. This may

indicate that some degree of anxiety concerning fear of failure might increase self-motivation of students to perform better in different academic tasks. The lack of a longitudinal relationship between anxiety and GPA has also been reported in some studies [10,84] and suggests that anxiety may be reflective of academic difficulties rather than being causal. Moreover, a longitudinal study in the United Arab Emirates reported that poor academic achievement caused anxiety among female students but not among male students [84].

The present study found that there was statistically significant relationship between lower class grade and increased sleep disturbance (poor sleep quality). Similar results have been observed in several prospective and cross-sectional conducted in Iran [62], Saudi Arabia [85–86], Germany [87], USA [88,89], and Argentina [90]. However, other studies have reported no relationship between lower class grade and increased sleep disturbance including those in Pakistan [91], Iran [92], Palestine [93], and Saudi Arabia [70,86,94]. This inconsistency in different studies could be due to diverse cultural aspects, sleep-wake patterns in hot and cold countries, and degree of access or use of electronic media (television, computers, smartphones). These factors should be taken into consideration in future studies.

Strengths and limitations

The main strength of the present study was the relatively large sample size and the use of psychometrically validated instruments. The findings of the study are limited by several factors. The limitations include (i) the cross-sectional design (which means causation and directional relationships between the study variables could not be determined), (ii) the inclusion of participants from public schools only (which means the findings cannot be generalized to schoolchildren from other types of schools), (iii) the data being collected from schools in only one city of Afghanistan (which means the findings cannot necessarily be generalized to schoolchildren from other Afghan cities), (iv) the under-representation of participants living in rural areas (which may affect the generalizability of the findings because the results may not reflect the experiences of this population), (v) the inclusion of female-only participants (which limits the applicability of the findings to a broader demographic, potentially overlooking how anxiety may differ across genders), and (vi) the data being self-report (which may have led to various biases including memory recall and social desirability). To advance the understanding of these mental health issues, future research studies in Afghanistan should include more diverse and representative

samples in terms of gender balance, the types of school attended, and where individuals live (both geographically and in terms of habitat [rural, urban, etc.]), as well as conducting longitudinal designs to better capture the dynamics of anxiety and sleep disturbances in relation to academic achievement over time.

Conclusion

The present study indicated a high prevalence of anxiety symptoms and sleep disturbance among female schoolchildren in Herat, Afghanistan. Both can have negative impacts on school performance. Anxiety and sleep disturbance among this cohort could be improved by changing current government policies and lifting the ban on female education in Afghanistan, campaigns on sleep education, and courses on time management. Researchers as well as education and public health department officials are encouraged to continue to assess students' well-being, methods of education, and factors that affect academic achievement. Also, school-based programs and activities, such as information-motivation-behavioral-based anxiety prevention programs and cognitive behavioral therapy-based interventions (delivered as part of the school curriculum or as an after-school activity targeting school children) could be initiated. These interventions would likely help in reducing many of the common barriers to treatment in the community, such as time, location, stigmatization, transportation and cost, by offering convenient, low-cost and non-threatening alternatives.

Consent for publication

Not applicable.

Ethical consideration

The study received ethical approval from the Afghanistan Center for Epidemiological Studies (reference number 23.1.004). Participants were systematically informed about the study's significance and objectives, with particular emphasis on elucidating the study's purpose for each individual. To safeguard confidentiality, personal identifiers were deliberately excluded from the survey. Participants were explicitly informed of their prerogative to withdraw from the study at any juncture. All procedures adhered scrupulously to pertinent ethical guidelines and regulations. Prior to participation, informed consent was sought and obtained from all individuals and their parents/guardians involved in the present study.

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Availability of data

All data relevant to the study are included in the paper or uploaded as supplementary information.

CRedit authorship contribution statement

Ahmad Neyazi: Writing – review & editing, Writing – original draft, Project administration, Methodology, Formal analysis, Data curation, Conceptualization. **Bilal Ahmad Rahimi:** Writing – review & editing, Writing – original draft. **Abdul Qadim Mohammadi:** Writing – review & editing, Writing – original draft. **Nosaibah Razaqi:** Writing – review & editing, Writing – original draft, Data curation. **Laila Qanawezi:** Writing – original draft. **Shaharah Sarem:** Writing – original draft. **Saida Said:** Writing – original draft. **Raz Mohammad Tabib:** Data curation, Writing – original draft. **Habibah Afzali:** Writing – review & editing, Writing – original draft, Data curation. **Mehrab Neyazi:** Writing – review & editing, Writing – original draft. **Mark D. Griffiths:** Writing –

review & editing, Writing – original draft.

Declaration of competing interest

Authors of this study declare that there are no competing interests.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.sleep.2024.100102.

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