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Association Between Sleep Quality and Burnout Among Primary and Secondary School Teachers

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Abstract Sleep problems and burnout are increasingly recognized as intertwined occupational health concerns in school settings. This study examined the association between sleep quality and burnout syndrome among general education school teachers in Mongolia. A cross-sectional design was used with 62 teachers (87.1% female; 79.0% secondary level). Sleep-related complaints were assessed using the World Health Organization Global Sleep Assessment Questionnaire (GSAQ) and the Insomnia Severity Index (ISI), and burnout was measured with the Copenhagen Burnout Inventory (CBI). Descriptive statistics, chi-square tests, Spearman correlations with Holm adjustment, and ordinal logistic regression were conducted (SPSS 24). Most teachers reported some level of sleep disturbance on the GSAQ (83.9%), with 53.2% classified as severe/very severe. ISI results indicated that 90.3% had at least mild insomnia symptoms, and 29.1% had moderate-to-severe insomnia. Overall burnout was predominantly moderate (51.6%), with 17.7% high burnout. Sleep disturbance showed significant positive associations with overall burnout (ρ=0.457, $p<.001$) and with personal and work-related burnout domains. In ordinal logistic regression, GSAQ sleep disturbance significantly predicted higher overall burnout levels (OR=1.946, 95% CI 1.201–3.152, p=0.007), whereas ISI severity was not significant after adjustment. These findings suggest that broad sleep-related symptom burden is a robust correlate of burnout severity among teachers, supporting routine screening and targeted sleep-focused and occupational stress interventions in educational workplaces.

Keywords Sleep, Sleep quality, Burnout syndrome, Occupational burnout, K–12 teacher, Secondary school teacher, Well-being

1. Introduction

1.1. Background

In a study conducted by Belinda Agyapong et al. [1], the authors reported that teacher stress and occupational burnout have been increasing globally, which in turn may contribute to the emergence of mental health problems, including anxiety and depression. Based on a synthesis of approximately 70 studies, the reported prevalence ranged from 25.12% to 74% for teacher burnout, 8.3% to 87.1% for stress, 38% to 41.2% for anxiety, and 4% to 77% for depression.

General education school teachers have encountered specific psychological challenges associated with their professional activities and have addressed them through various coping strategies. Protecting teachers' mental health not only positively influences social relationships and the quality of education, but also constitutes a substantial contribution to a country's future development. Nevertheless, there remains a persistent lack of empirical evidence that could serve as a foundation for providing professional support and for accurately assessing and interpreting the situation.

Teachers represent the primary human resource underpinning educational quality. Diverse work-related pressures create a stressful occupational environment for teachers and, over time, increase the risk of occupational burnout. Burnout manifests across three dimensions—psychological exhaustion, interpersonal detachment, and a reduced sense of professional accomplishment—and adversely affects the quality of instruction, students' learning outcomes, and organizational productivity.

Conversely, sleep quality is a fundamental physiological need that is directly associated with psychological equilibrium, attention and concentration, decision-making, and emotion regulation. International studies indicate that teachers may be at increased risk of sleep disruption due to various adverse work- and life-related influences. The literature commonly suggests that poorer sleep quality is linked to heightened psychological fatigue and stress, whereas good sleep is associated with a stronger sense of professional accomplishment.

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Accordingly, in the Mongolian context, identifying the association between teachers' sleep quality and burnout, as well as the contributing factors, can support evidence-informed decision-making by policymakers and school leaders. It may also help teachers protect their mental health, maintain overall well-being, and create conditions conducive to sustained productivity at work.

1.2. Research Aim

To determine the association between sleep quality and occupational burnout among general education school teachers and to examine the factors influencing this relationship.

1.3. Scientific Hypotheses

H1 (directed). Higher sleep-related symptom burden (GSAQ) is associated with higher overall burnout (CBI overall) among teachers.

H2 (directed). Higher insomnia symptom severity (ISI) is associated with higher overall burnout (CBI overall) among teachers.

H3 (directed). GSAQ symptom burden is positively associated with personal and work-related burnout domains (CBI personal; CBI work-related).

H4 (directed). After adjustment for demographic covariates, GSAQ severity remains a significant predictor of higher overall burnout level in an ordinal logistic regression model.

We tested directed hypotheses of positive associations between sleep-related indicators (GSAQ/ISI) and burnout (CBI) using Spearman correlations and ordinal logistic regression.

2. Literature

Sleep quality is a multidimensional construct reflecting sleep initiation, maintenance, duration, continuity, and next-day restoration. Poor or insufficient sleep is associated with adverse cardiometabolic and mental-health outcomes and reduced cognitive functioning, which are directly relevant to teachers' performance and well-being [2,3,4,5]. In this study, sleep-related difficulties were assessed using a broad symptom screener (GSAQ) and a focused insomnia severity measure (ISI).

Burnout is commonly defined as a work-related syndrome arising from chronic, poorly managed occupational stress. The ICD-11 description emphasizes exhaustion, mental distance/cynicism, and reduced professional efficacy [6]. Teacher burnout is a persistent international concern with implications for retention, instructional es [1,7].

Theoretical rationale for linking sleep and burnout is well-established in occupational health models. The Job Demands –Resources (JD–R) model and Effort–Recovery framework conceptualize sleep as a core recovery process; when recovery is incomplete, strain accumulates and increases exhaustion and disengagement [8]. Conservation of Resources theory further frames restorative sleep as a foundational resource that buffers stress-related resource loss cycles [9].

Empirical evidence in teachers indicates that sleep disturbance co-occurs with burnout symptoms. Recent teacher studies report positive associations between sleep disturbance and burnout risk and highlight the role of personal and contextual resources (e.g., resilience) in moderating these links [10,11]. Related occupational evidence shows comparable associations between sleep problems and burnout in other high-demand professions [12]. More recent post-pandemic teacher evidence also links sleep quality to stress-related outcomes, underscoring the ongoing relevance of sleep-focused prevention approaches [13].

3. Methodology

3.1. Study Design and Setting

A cross-sectional survey was conducted among primary and secondary school teachers working in Erdenebulgan soum (Schools No. 1–3) and Ögiinuur soum (K–12 school), Arkhangai Province, Mongolia. The analytic sample included 62 teachers.

3.2. Measures

Sleep-related complaints and burnout were assessed using validated self-report instruments as described below.

Sleep-related complaints were assessed using the Global Sleep Assessment Questionnaire (GSAQ), a brief self-report screening tool developed to identify symptoms consistent with multiple common sleep disorders in community and primary-care contexts. The GSAQ is designed to capture a broad symptom profile (rather than a single disorder), making it appropriate for studies where sleep problems may present heterogeneously (e.g., insomnia symptoms, breathing-related sleep disturbance, restless legs symptoms, and parasomnias). In the original validation work, the GSAQ demonstrated utility in differentiating individuals with sleep disorders from those without sleep disorders, supporting its use as an efficient screening measure in applied research settings [14]. In the present study, internal consistency for the GSAQ symptom screening items/domains was acceptable ([α =0.81]).

Insomnia symptom severity was measured using Morin and colleagues' Insomnia Severity Index (ISI), a widely used 7-item self-report instrument assessing the perceived severity, impact, and distress associated with insomnia symptoms. The ISI evaluates core insomnia domains (e.g., difficulty initiating sleep, difficulty maintaining sleep, and early morning awakenings) together with satisfaction with sleep, interference with daytime functioning, noticeability of impairment, and worry/distress about sleep. Items were rated on a 0–4 Likert scale and summed to yield a total score ranging from 0 to 28, with higher scores indicating greater insomnia severity. Common interpretive bands were 0–7

(no clinically significant insomnia), 8–14 (subthreshold insomnia), 15–21 (moderate clinical insomnia), and 22–28 (severe clinical insomnia) [15]. In the present sample, the ISI showed good internal consistency ([α =0.789]).

Burnout was assessed using the Copenhagen Burnout Inventory (CBI) developed by Kristensen and colleagues, which conceptualizes burnout primarily as fatigue and exhaustion and distinguishes three domains: personal burnout, work-related burnout, and client-related burnout. The standard CBI contains 19 items distributed across these subscales (typically 6 personal, 7 work-related, and 6 client-related). Responses were recorded using frequency/intensity-style options that can be transformed to a 0–100 metric (higher scores indicating higher burnout), facilitating interpretation and comparability across subscales. Evidence from validation work supports satisfactory reliability and construct validity of the three-factor structure in occupational research [16,17]. In the present study, internal consistency was acceptable for the personal burnout ([α = 0.767]), work-related burnout ([α = 0.739]), and client-related burnout subscales ([α = 0,760]).

Collectively, these measures supported a coherent measurement strategy: the GSAQ provided broad screening of sleep-problem indicators, the ISI yielded a focused and clinically interpretable index of insomnia symptom severity and daytime impact, and the CBI captured multidimensional exhaustion central to burnout. This combination enabled examination of whether insomnia severity and broader sleep-related complaints were associated with (or predicted) personal, work-related, and client-related burnout dimensions in the target population [17,15,14].

3.3. Statistical Analysis

Analyses were conducted using IBM SPSS Statistics 24. Descriptive statistics were computed, followed by nonparametric tests (Spearman rank correlations with Holm correction; Mann–Whitney U tests; Kruskal–Wallis tests), chi-square tests for cross-tabulations, and ordinal logistic regression.

4. Result

4.1. Participant Characteristics

A total of 62 general education school teachers were included in the analysis (no missing data across study variables). (see Table 1) Most participants were female (87.1%), and the majority were secondary school teachers (79.0%). Age groups were distributed as follows: ≤30 (21.0%), 31–35 (14.5%), 36–40 (21.0%), 41–45 (24.2%), 46–49 (16.1%), and 50–55 (3.2%). Teaching experience was most commonly 6–10 years (25.8%) or 11–15 years (22.6%), with smaller proportions in 1–5 years (14.5%), 16–20 years (9.7%), and 36+ years (1.6%). Professional rank was predominantly methodologist teacher (45.2%), followed by teacher (27.4%) and leading teacher (25.8%).

Table 1. Participant Characteristics (Frequencies and Percentages)

Variable	Category	n	%
Workplace (school)	K–12 school in Ögiinuur Soum	14	22.6
	K–12 School-1 in Erdenebulgan Soum	23	37.1
	K–12 School-2 in Erdenebulgan Soum	8	12.9
	K–12 School-3 in Erdenebulgan Soum	17	27.4
Age group (years)	≤30	13	21.0
	31-35	9	14.5
	36-40	13	21.0
	41-45	15	24.2
	46-49	10	16.1
	50-55	2	3.2
Gender	Male	8	12.9
	Female	54	87.1
Teaching experience (years)	1-5 year	9	14.5
	6-10	16	25.8
	11-15	14	22.6
	16-20	6	9.7
	21-25	13	21.0
	26-30	3	4.8
	36+	1	1.6
Teacher professional rank	Teacher	17	27.4
	Methodologist teacher	28	45.2
	Leading teacher	16	25.8
	Consultant teacher	1	1.6
Graduating institution	NUM	7	11.3
	MNUE	33	53.2
	Branch school in Arkhangai	10	16.1
	Others	12	19.4
Household size	1	1	1.6
	2	4	6.5
	3	8	12.9
	4	18	29.0
	5	20	32.3
	6+	11	17.7
Teaching level	Primary school teacher	13	21.0
	Secondary school teacher	49	79.0

4.2. On the Reliability of Measures

Internal consistency reliability for the study scales was acceptable. Across the six composite indicators (CBI personal burnout, CBI work-related burnout, CBI client-related burnout, CBI overall burnout, GSAQ sleep symptoms screener score, and ISI total score), Cronbach's alpha was α = 0.794 (6 items). (see Table 2). Corrected item–total correlations ranged from 0.419 to 0.792, indicating that each composite contributed meaningfully to the overall reliability. Item-deletion diagnostics showed that Cronbach's alpha would

range from 0.717 to 0.810 if any single indicator were removed, suggesting that no individual composite unduly inflated reliability. (see Table 3).

The lowest corrected item–total correlation was observed for the ISI total score (0.419), while the strongest contribution was observed for CBI overall burnout (0.792). Overall, these findings support the internal consistency of the measures used for subsequent correlational and regression analyses.

Table 2. Cronbach's Alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
.794	6

4.3. Distribution of Sleep Disturbance and Burnout Severity

On the sleep symptom screening measure (GSAQ severity levels), 53.2% of teachers reported severe or very severe disturbance (severe: 37.1%; very severe: 16.1%), while 16.1% reported no disturbance. On the insomnia severity classification (ISI levels), most teachers fell in the mild insomnia category (61.3%), with 22.6% reporting moderate insomnia and 6.5% severe insomnia (combined moderate-to-severe: 29.1%). Regarding burnout (CBI levels), overall burnout was most frequently moderate (51.6%), with 30.6% low and 17.7% high. Subscale patterns were similar, with high burnout observed in personal burnout (27.4%), work-related burnout (22.6%), and client-related burnout (14.5%). (Table 4)

Table 3. Cronbach's Alpha Item-Total Statistics

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
CBI Personal Burnout level	11.06	9.668	.530	.767
CBI Work-related Burnout level	11.05	9.424	.690	.739
CBI Client-related Burnout level	11.37	9.647	.569	.760
CBI Overall burnout level	11.19	8.946	.792	.717
GSAQ sleep symptoms screener score	9.84	7.121	.530	.810
Insomnia Severity Index total score	10.81	10.224	.419	.789

Table 4. Distribution Of Sleep Disturbance and Burnout Severity Levels

Measure	Category	n	%
GSAQ sleep symptoms screener score	No disturbance	10	16.1
	Mild disturbance	9	14.5
	Moderate disturbance	10	16.1
	Severe disturbance	23	37.1
	Very severe disturbance	10	16.1
Insomnia Severity Index total score	No insomnia	6	9.7
	Mild insomnia	38	61.3
	Moderate insomnia	14	22.6
	Severe insomnia	4	6.5
CBI Personal Burnout level	Low	17	27.4
	Moderate	28	45.2
	High	17	27.4
CBI Work-related Burnout level	Low	13	21.0
	Moderate	35	56.5
	High	14	22.6
CBI Client-related Burnout level	Low	28	45.2
	Moderate	25	40.3
	High	9	14.5
CBI Overall burnout level	Low	19	30.6
	Moderate	32	51.6
	High	11	17.7

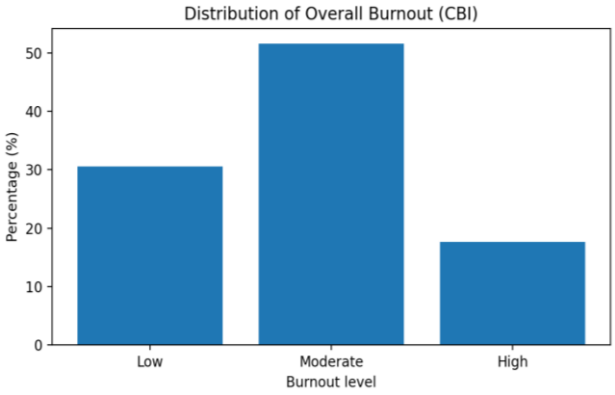

Figure 1. Distribution of overall burnout levels (CBI overall)

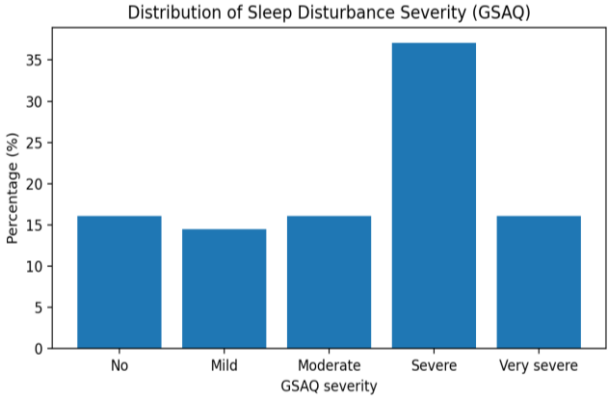

Figure 2. Distribution of sleep disturbance severity levels (GSAQ)

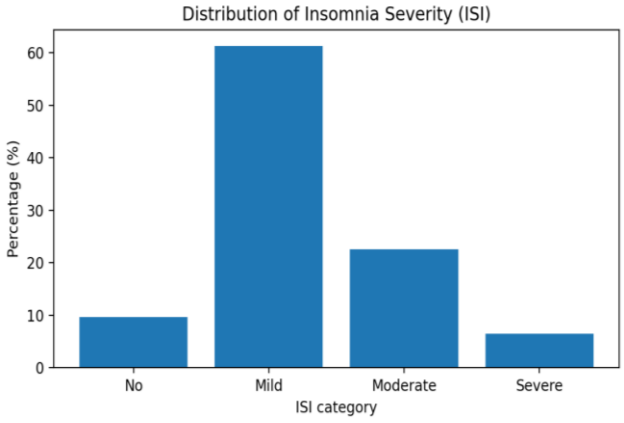

Figure 3. Distribution of insomnia severity levels (ISI)

4.4. Associations Between Sleep Disturbance and Burnout

Spearman rank correlations were used to examine monotonic associations between sleep disturbance severity and burnout severity. To control the familywise error rate across multiple correlation tests, Holm-adjusted p values are also reported (Table 5).

Overall, greater sleep disturbance severity was associated with higher burnout severity. GSAQ symptom severity showed moderate positive associations with overall burnout ($\rho = .457$) and with the personal and work-related burnout subscales (ρ range = .386-.423). These associations remained statistically significant after Holm correction (Holm-adjusted p = .001-.012). The association between GSAQ severity and client-related burnout was smaller ($\rho = .279$) and did not remain statistically significant after Holm correction (Holm-adjusted p = .085).

ISI symptom severity was positively associated with overall burnout ($\rho = .370$; Holm-adjusted p = .015) and work-related burnout ($\rho = .348$; Holm-adjusted p = .022). The ISI association with personal burnout was not statistically significant ($\rho = .171$; p = .185). The ISI association with client-related burnout was small ($\rho = .265$) and did not remain statistically significant after Holm correction (Holm-adjusted p = .085).

To complement the rank-correlation results, contingency (cross-tabulation) analyses were conducted using chi-square tests. These categorical analyses were consistent with the correlational findings (Tables 6-6B-1).

ISI severity level was significantly associated with overall burnout level, $\chi^2(6) = 13.86$, p = .031, with a moderate effect size (Cramer's V = .334; N = 62) (Table 6). Similarly, GSAQ severity level was significantly associated with overall burnout level, $\chi^2(8) = 15.93$, p = .043, also with a moderate effect size (Cramer's V = .358; N = 62) (Table 6B).

As shown in Table 6A, the proportion of teachers classified in the high-burnout group increased with insomnia severity. No participants in the 'No insomnia' group were classified as high burnout (0.0%), whereas 50.0% of those in the 'Severe insomnia' group were classified as high burnout. Teachers with mild insomnia were most frequently classified as moderate burnout (57.9%), while those with moderate insomnia showed a larger share in the high-burnout group (28.6%).

Table 5. Associations Between Sleep Severity and Burnout (Spearman Rank Correlations)

Sleep measure	Burnout domain	Spearman ρ	p	Holm-adjusted p
GSAQ sleep symptoms screener score	CBI Personal Burnout level	0.423	< .001	= 0.004
GSAQ sleep symptoms screener score	CBI Work-related Burnout level	0.386	= 0.002	= 0.012
GSAQ sleep symptoms screener score	CBI Client-related Burnout level	0.279	= 0.028	= 0.085
GSAQ sleep symptoms screener score	CBI Overall burnout level	0.457	< .001	= 0.001
Insomnia Severity Index total score	CBI Personal Burnout level	0.171	= 0.185	= 0.185
Insomnia Severity Index total score	CBI Work-related Burnout level	0.348	= 0.006	= 0.022
Insomnia Severity Index total score	CBI Client-related Burnout level	0.265	= 0.037	= 0.085
Insomnia Severity Index total score	CBI Overall burnout level	0.370	= 0.003	= 0.015

Table 6. Association Between ISI Severity Level and Overall Burnout Level (Chi-square Test)

Row variable	Column variable	Chi-square (χ^2)	df	p	Cramér's V	N
Insomnia Severity Index total score	CBI Overall burnout level	13.863	6	= 0.031	0.334	62

Table 6A. ISI Level by Overall Burnout Level (Cell Counts and Row Percentages)

Insomnia Severity Index total score	CBI Overall burnout level	n	Row %
Mild insomnia	High	5	13.2
	Low	11	28.9
	Moderate	22	57.9
Moderate insomnia	High	4	28.6
	Low	2	14.3
	Moderate	8	57.1
No insomnia	High	0	0.0
	Low	5	83.3
	Moderate	1	16.7
Severe insomnia	High	2	50.0
	Low	1	25.0
	Moderate	1	25.0

Table 6B. Association Between GSAQ Severity Level and Overall Burnout Level (Chi-square Test)

Row variable	Column variable	Chi-square (χ^2)	df	p	Cramér's V	N
GSAQ sleep symptoms screener score	CBI Overall burnout level	15.933	8	= 0.043	0.358	62

Table 6B-1. GSAQ Level by Overall Burnout Level (Cell Counts and Row Percentages)

GSAQ sleep symptoms screener score	CBI Overall burnout level	n	Row %
Mild disturbance	High	0	0.0
	Low	4	44.4
	Moderate	5	55.6
Moderate disturbance	High	1	10.0
	Low	3	30.0
	Moderate	6	60.0
No disturbance	High	0	0.0
	Low	6	60.0
	Moderate	4	40.0
Severe disturbance	High	5	21.7
	Low	5	21.7
	Moderate	13	56.5
Very severe disturbance	High	5	50.0
	Low	1	10.0
	Moderate	4	40.0

Table 6B-1 shows a similar pattern for the broader sleep-symptom screener. None of the teachers with mild or no sleep disturbance were classified as high burnout (0.0% in both groups). In contrast, 21.7% of those with severe disturbance and 50.0% of those with very severe disturbance were classified as high burnout. Teachers without disturbance were most often classified in the low-burnout group (60.0%).

4.5. Group Differences in Sleep and Burnout Severity

Nonparametric group comparisons indicated no statistically significant differences in sleep disturbance severity (GSAQ level), insomnia severity (ISI level), or overall burnout level by gender or by teaching level (primary vs secondary). Mann-Whitney U tests yielded p-values of .31 or greater across all comparisons (Table 7), and corresponding effect sizes were small (r = .02 to .12).

Table 7. Group Differences by Gender and Teaching Level (Mann-Whitney U Tests)

Grouping variable	Outcome	U	p	Effect size r	Group sizes
Gender	GSAQ sleep symptoms screener score	256.5	= 0.385	0.108	Male (n=8), Female (n=54)
Gender	Insomnia Severity Index total score	207.0	= 0.837	0.024	Male (n=8), Female (n=54)
Gender	CBI Overall burnout level	171.5	= 0.310	0.119	Male (n=8), Female (n=54)
Teaching level	GSAQ sleep symptoms screener score	288.5	= 0.598	0.066	Primary school teacher (n=13), Secondary school teacher (n=49)
Teaching level	Insomnia Severity Index total score	357.5	= 0.444	0.086	Primary school teacher (n=13), Secondary school teacher (n=49)
Teaching level	CBI Overall burnout level	354.5	= 0.500	0.079	Primary school teacher (n=13), Secondary school teacher (n=49)

Table 7A. Group Differences in Overall Burnout Across Multi-Level Factors (Kruskal-Wallis Tests)

Outcome	Factor	H	f	p	Epsilon-squared (ε^2)
CBI Overall burnout level	Graduating institution	12.718	3	= 0.005	0.168
	Household size	9.011	5	= 0.109	0.072
	Teacher professional rank	4.976	3	= 0.174	0.034
	Age group (years)	3.591	5	= 0.610	-0.025
	Workplace (school)	1.066	3	= 0.785	-0.033
	Teaching experience (years)	2.847	6	= 0.828	-0.057

Table 8. Ordinal Logistic Regression Predicting Overall Burnout Level

Predictor	B	OR	95% CI for OR	p
GSAQ sleep symptoms screener score	0.666	1.946	[1.201, 3.152]	= 0.007
Insomnia Severity Index total score	0.740	2.097	[0.874, 5.029]	= 0.097
Age group (years)	-0.399	0.671	[0.384, 1.172]	= 0.161
Gender	1.402	4.063	[0.773,21.356]	= 0.098
Teaching experience (years)	0.135	1.144	[0.704, 1.860]	= 0.587
Teaching level	-0.124	0.884	[0.235, 3.321]	= 0.855

Table 9. Ordinal Logistic Regression Model Fit (Likelihood-ratio Test and Pseudo R^2)

Model	N	Log-likelihood (full)	Log-likelihood (null)	LR χ^2	df	p	McFadden pseudo R^2
Ordinal logistic regression (logit link)	62	-51.707	-62.658	21.901	6	= 0.001	0.175

Across multi-level demographic factors, overall burnout level differed significantly by graduating institution (Kruskal -Wallis H(3) = 12.72, p = .005), with a moderate effect size (epsilon-squared = .168) (Table 7A). The proportion classified as high overall burnout was higher among teachers graduating from “Others” (50.0%) and Arkhangai branch school (30.0%), compared with MNUE (6.1%) and NUM (0.0%); however, these subgroup estimates should be interpreted cautiously given the modest cell sizes. No other multi-level demographic factors (age group, workplace/school, teaching experience group, household size, or professional rank) showed statistically significant differences in overall burnout level (Table 7A).

In the ordinal logistic regression model, higher GSAQ scores were associated with higher odds of being in a more severe overall burnout category (OR = 1.95, 95% CI [1.20, 3.15], p = .007) (Table 8). ISI total score was not a statistically significant predictor at alpha = .05 (p = .097), and no demographic covariates (age group, gender, teaching experience, or teaching level) were significant predictors in the adjusted model (Table 8). The model demonstrated acceptable overall fit relative to the null model (likelihood-ratio chi-square(6) = 21.90, p = .001) with McFadden pseudo R-squared = .175 (Table 9).

5. Discussion

This study examined the relationship between sleep-related difficulties and burnout among general education school teachers. Three key findings emerged. First, sleep

problems were highly prevalent in the sample: most teachers reported notable sleep-related complaints on the GSAQ and at least mild insomnia symptoms on the ISI. Second, burnout levels were non-trivial, with the majority reporting moderate burnout and a meaningful minority reporting high burnout. Third, sleep disturbance—operationalized as a broader symptom burden on the GSAQ—showed a consistent positive association with burnout severity and remained an independent predictor of higher overall burnout in ordinal logistic regression, whereas ISI severity did not retain significance after adjustment.

Recent evidence further supports the practical relevance of sleep for teacher health. Post-pandemic teacher research has documented that poorer sleep quality is meaningfully related to higher psychological stress and adverse health complaints, highlighting sleep as a key target for occupational well-being initiatives [13]. In parallel, recent work in teachers shows that psychosocial job risks and limited personal resources contribute to burnout vulnerability, strengthening the rationale for integrated interventions that address both recovery (sleep) and work stressors [18].

Interpretation of the main association

The observed positive relationship between sleep disturbance and burnout is theoretically coherent and aligns with what is commonly reported in occupational health research: inadequate or disturbed sleep can undermine recovery and exacerbate fatigue, emotional exhaustion, and reduced work capacity. Teachers perform sustained emotional and cognitive labour (e.g., classroom management, decision-making, student support), and insufficient restorative sleep may reduce self-regulation, attentional control, and stress tolerance. Over time, this can translate into a higher perceived workload, greater emotional exhaustion, and reduced resilience to day-to-day job demands—core features that map onto burnout constructs. At the same time, it is plausible that the relationship is bidirectional: burnout-related stress may worsen sleep through rumination, heightened physiological arousal, and reduced opportunities for recovery. Because the present data are cross-sectional, the direction of influence cannot be determined; however, the strength and consistency of the association support the practical value of screening for sleep issues in teacher well-being initiatives.

Why GSAQ predicted burnout, but ISI did not (after adjustment)

An important result is that GSAQ sleep disturbance predicted higher burnout levels in regression analyses, while ISI did not remain significant when other variables were included. One interpretation is measurement scope. The ISI focuses specifically on insomnia symptom severity (difficulty initiating or maintaining sleep and related distress), whereas the GSAQ is designed as a broad screener capturing a wider array of sleep-disorder symptom domains. In occupational contexts, burnout may be more strongly linked to an overall "sleep-symptom load" (e.g., fragmented sleep, non-restorative sleep, sleep-related breathing symptoms, restless legs-type complaints, or parasomnia-related disruptions) rather than insomnia symptoms alone. In addition, the GSAQ may capture functional consequences of sleep problems more comprehensively, which may align more closely with work-related exhaustion.

A second interpretation concerns statistical overlap. If GSAQ and ISI are correlated, the regression model may attribute shared variance to the predictor that better captures the broader disturbance pattern (GSAQ), leaving ISI with less unique explanatory power. This does not imply that insomnia is unimportant; rather, it suggests that in this dataset, global sleep-related symptom burden was a more robust indicator of burnout severity than insomnia symptom severity alone.

Practical implications for schools and occupational health

The findings have several implications for prevention and support programs for teachers. First, integrating brief sleep screening into routine occupational well-being assessments may help identify individuals at heightened risk of burnout. In particular, a broad screener may be useful as an early warning signal because it captures multiple sleep-related complaints that can accumulate and impair recovery. Second, intervention approaches may be most effective when they address both domains simultaneously: improving sleep-related behaviours and conditions while also reducing work-related strain and supporting recovery. School-level actions could include workload and scheduling reviews (e.g., balancing administrative duties, minimizing late-evening demands), promoting protected recovery time, and providing access to stress-management and sleep-focused behavioural strategies. Individual-level support may include structured sleep hygiene education, brief behavioural interventions for insomnia when indicated, and guidance on managing rumination and pre-sleep arousal. Taken together, these steps may improve daily functioning and reduce the likelihood of progression to more severe burnout.

Within Mongolia, where teachers may face resource constraints and high job demands, the strong association between sleep disturbance and burnout underscores the need for feasible, scalable approaches—brief screening, targeted referral pathways, and low-intensity interventions that can be delivered within school systems or community health settings. The use of a World Health Organization–linked screening approach (GSAQ) also supports the feasibility of adopting pragmatic tools in applied educational and occupational contexts.

Limitations

Several limitations should be noted when interpreting these results. First, the cross-sectional design prevents causal conclusions and cannot clarify whether sleep disturbance contributes to burnout, burnout contributes to sleep disturbance, or both processes occur simultaneously. Second, the sample size was modest and drawn from a specific teacher group; therefore, the generalizability of prevalence estimates and effect sizes may be limited. Third, all measures relied on self-report, which can introduce reporting bias and shared method variance. Fourth, while the analyses used

appropriate nonparametric correlations and ordinal regression, unmeasured factors (e.g., comorbid health conditions, medication use, shift-like schedules, family caregiving load, school climate, or seasonal workload variation) could confound or modify the observed associations.

Future research directions

Future studies should use larger, more diverse teacher samples and incorporate longitudinal designs to examine temporal ordering—whether baseline sleep disturbance predicts later increases in burnout or whether rising burnout predicts worsening sleep. Where feasible, adding objective sleep indicators (e.g., actigraphy) or clinically oriented assessments could strengthen measurement validity. Intervention studies are also needed to test whether improving sleep (through behavioural sleep interventions or organizational policy changes that enhance recovery) yields measurable reductions in burnout over time, and to identify which components are most effective for teachers. Finally, examining subgroup differences (e.g., by age, teaching level, workload, or years of experience) may help tailor prevention and support strategies more precisely.

Overall, this study highlights that sleep-related difficulties are common among teachers and are closely linked to burnout severity. The results support the inclusion of sleep screening and integrated sleep–stress interventions as practical components of teacher occupational health and well-being programs.

6. Conclusions

This cross-sectional study of 62 general education school teachers (87.1% female; 79.0% secondary level) in Mongolia demonstrates that sleep-related difficulties are widespread and meaningfully linked to burnout severity. On the GSAQ, 83.9% of teachers reported sleep-disorder–related complaints, with 53.2% classified as severe/very severe. On the ISI, 90.3% reported at least mild insomnia symptoms, including 29.1% with moderate-to-severe insomnia. Burnout was also substantial: 51.6% of teachers reported moderate burnout and 17.7% reported high burnout.

Importantly, broader sleep disturbance (GSAQ) showed a moderate positive association with overall burnout (Spearman $\rho=0.457$, $p<.001$) and remained an independent predictor of higher burnout levels in ordinal logistic regression (OR=1.946, 95% CI 1.201–3.152, $p=0.007$). In contrast, insomnia symptom severity (ISI) did not retain statistical significance after adjustment, suggesting that a multi-symptom sleep burden may capture the sleep-related functional load most closely tied to occupational exhaustion.

Taken together, these findings support integrating brief sleep screening into teacher occupational health programs and prioritizing combined sleep-focused and work-stress–reduction interventions. However, given the modest sample size, self-report measurement, and cross-sectional design, larger longitudinal and intervention studies are needed to clarify directionality and to test whether improving sleep leads to meaningful reductions in burnout over time.

REFERENCES

[1] Agyapong, B., Obuobi-Donkor, G., Burback, L., & Wei, Y. (2022). Stress, burnout, anxiety and depression among teachers: A scoping review. International Journal of Environmental Research and Public Health, 19(17), 10706. https://doi.org/10.3390/ijerph191710706.

[2] Barger, L. K., Ayas, N. T., Cade, B. E., Cronin, J. W., Rosner, B., Speizer, F. E., & Czeisler, C. A. (2006). Impact of extended-duration shifts on medical errors, adverse events, and attentional failures. PLoS Medicine, 3(12), e487. https://doi.org/10.1371/journal.pmed.0030487.

[3] Doolin, J., Vilches, J. E., Cooper, C., Gipson, C., & Sorensen, W. (2018). Perceived stress and worldview influence sleep quality in Bolivian and United States university students. Sleep Health, 4(6), 565–571. https://doi.org/10.1016/j.sleh.2018.08.006.

[4] Gardani, M., Bradford, D. R. R., Russell, K., Allan, S., Beattie, L., Ellis, J. G., & Akram, U. (2022). A systematic review and meta-analysis of poor sleep, insomnia symptoms and stress in undergraduate students. Sleep Medicine Reviews, 61, 101565. https://doi.org/10.1016/j.smrv.2021.101565.

[5] Irwin, M. R. (2015). Why sleep is important for health: A psychoneuroimmunology perspective. Annual Review of Psychology, 66, 143–172. https://doi.org/10.1146/annurev-psych-010213-115205.

[6] World Health Organization. (2019, May 28). Burn-out an "occupational phenomenon": International Classification of Diseases (ICD-11).

[7] Dreer, B. (2023). On the outcomes of teacher wellbeing: A systematic review of research. Frontiers in Psychology, 14, 1205179. https://doi.org/10.3389/fpsyg.2023.1205179.

[8] Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands–resources model of burnout. Journal of Applied Psychology, 86(3), 499–512. https://doi.org/10.1037/0021-9010.86.3.499.

[9] Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. American Psychologist, 44(3), 513–524. https://doi.org/10.1037//0003-066X.44.3.513.

[10] Sánchez-Narváez, F., Velasco-Orozco, J. J., & Pérez-Archundia, E. (2023). Burnout syndrome and sleep quality in basic education teachers in Mexico. International Journal of Environmental Research and Public Health, 20(13), 6276. https://doi.org/10.3390/ijerph20136276.

[11] Yang, Z., Wang, D., Fan, Y., Ma, Z., Chen, X., Zhang, Y., & Fan, F. (2023). Relationship between sleep disturbance and burnout among Chinese urban teachers: Moderating roles of resilience. Sleep Medicine, 108, 29–37. https://doi.org/10.1016/j.sleep.2023.06.002.

[12] Membrive-Jiménez, M. J., Gómez-Urquiza, J. L., Suleiman-Martos, N., Velando-Soriano, A., Ariza, T., De la Fuente-Solana, E. I., & Cañadas-De la Fuente, G. A. (2022). Relation between burnout and sleep problems in nurses: A systematic review with meta-analysis. Healthcare, 10(5), 954.

https://doi.org/10.3390/healthcare10050954.

[13] Mancone, S., et al. (2024). Exploring the interplay between sleep quality, stress, and somatization among teachers in the post-COVID-19 era. International Journal of Environmental Research and Public Health. https://pmc.ncbi.nlm.nih.gov/articles/PMC11311578/.

[14] Roth, T., Zammit, G., Kushida, C., Doghramji, K., Mathias, S. D., Wong, J. M., & Buysse, D. J. (2002). A new questionnaire to detect sleep disorders. Sleep Medicine, 3(2), 99–108. https://doi.org/10.1016/S1389-9457(01)00131-9.

[15] Morin, C. M., Belleville, G., Bélanger, L., & Ivers, H. (2011). The Insomnia Severity Index: Psychometric indicators to detect insomnia cases and evaluate treatment response. Sleep, 34(5), 601–608. https://doi.org/10.1093/sleep/34.5.601.

[16] Borritz, M., & Kristensen, T. S. (2004, February). Copenhagen Burnout Inventory: Normative data from a representative Danish population on personal burnout and results from the PUMA study on personal burnout, work burnout, and client burnout (1st ed.). National Institute of Occupational Health, Denmark.

[17] Kristensen, T. S., Borritz, M., Villadsen, E., & Christensen, K. B. (2005). The Copenhagen Burnout Inventory: A new tool for the assessment of burnout. Work & Stress, 19(3), 192–207. https://doi.org/10.1080/02678370500297720.

[18] Barros, C., Barros, P., & Faria, C. (2025). Psychosocial risk factors and burnout among teachers: Can emotional intelligence make a difference? International Journal of Environmental Research and Public Health, 22(9), 1439. https://doi.org/10.3390/ijerph22091439.

[19] Åkerstedt, T. (2006). Psychosocial stress and impaired sleep. Scandinavian Journal of Work, Environment & Health, 32(6), 493–501. https://doi.org/10.5271/sjweh.1054.

[20] Bastien, C. H., Vallières, A., & Morin, C. M. (2001). Validation of the Insomnia Severity Index as an outcome measure for insomnia research. Sleep Medicine, 2(4), 297–307. https://doi.org/10.1016/S1389-9457(00)00065-4.

[21] Breckling, J. (Ed.). (1989). The analysis of directional time series: Applications to wind speed and direction (Lecture Notes in Statistics, Vol. 61). Springer. https://doi.org/10.1007/978-1-4612-3688-7.

[22] Buysse, D. J., Reynolds, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. Psychiatry Research, 28(2), 193–213. https://doi.org/10.1016/0165-1781(89)90047-4.

[23] Chen, Z., Foo, Z. S. T., Tang, J. Y., Sim, M. W. C., Lim, B. L., Fong, K. Y., & Tan, K. H. (2023). Sleep quality and burnout: A Singapore study. Sleep Medicine, 102, 205–212. https://doi.org/10.1016/j.sleep.2022.12.026.

[24] Dorjkhand, B. (2022). In Search of Sleep. Ulaanbaatar.

[25] Elfering, A., Kottwitz, M. U., Tamcan, Ö., Müller, U., & Mannion, A. F. (2018). Impaired sleep predicts onset of low back pain and burnout symptoms: Evidence from a three-wave study. Psychology, Health & Medicine, 23(10), 1196–1210. https://doi.org/10.1080/13548506.2018.1479038.

[26] Frick, S., Smolders, K., van der Meij, L., Demerouti, E., & de Kort, Y. (2025). The bidirectional relationship between sleep and daily burnout-related experiences: Self-report vs. actigraphy-derived measures. Sleep Health, 11(3), 382–389. https://doi.org/10.1016/j.sleh.2025.03.007.

[27] Kim, L. E., Jörg, V., & Klassen, R. M. (2019). A meta-analysis of the effects of teacher personality on teacher effectiveness and burnout. Educational Psychology Review, 31, 163–195. https://doi.org/10.1007/s10648-018-9458-2.

[28] Madigan, D. J., Kim, L. E., Glandorf, H. L., & Kavanagh, O. (2023). Teacher burnout and physical health: A systematic review. International Journal of Educational Research, 119, 102173. https://doi.org/10.1016/j.ijer.2023.102173.

[29] Maslach, C., & Leiter, M. P. (2016). Understanding the burnout experience: Recent research and its implications for psychiatry. World Psychiatry, 15(2), 103–111. https://doi.org/10.1002/wps.20311.

[30] Metev, S. M., & Veiko, V. P. (1998). Laser-assisted microtechnology (2nd ed.; R. M. Osgood Jr., Ed.). Springer. https://doi.org/10.1007/978-3-642-87271-6.

[31] Munkh, E., & Solongo, B. (2022). Psychological Support Services for Emergency Management Agency Personnel. Ulaanbaatar.

[32] Musa, N. A., Moy, F. M., & Wong, L. P. (2018). Prevalence and factors associated with poor sleep quality among secondary school teachers in a developing country. Industrial Health, 56(5), 407–418. https://doi.org/10.2486/indhealth.2018-0052.

[33] Qin, L., Chen, S., Luo, B., & Chen, Y. (2022). The effect of learning burnout on sleep quality in primary school students: The mediating role of mental health. Healthcare, 10(10), 2076. https://doi.org/10.3390/healthcare10102076.

[34] Riemann, D., et al. (2010). The hyperarousal model of insomnia: A review of the concept and its evidence. Sleep Medicine Reviews, 14(1), 19–31. https://doi.org/10.1016/j.smrv.2009.04.002.