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Knowledge, Associated Factors and Effects of Sleep Quality on the Academic Performance Among High School Students in Selected Secondary Schools in Buea, Cameroon

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Abstract

Purpose: Most high school students have poor sleep quality which tends to affect their academic performance accompanied by other associated factors. The aim of this study was to assess the knowledge, associated factors and effects of sleep quality on academic performance among high school students in selected secondary schools in Buea.
Materials and Methods: A school-based cross-sectional study was conducted amongst 296 high school students in Bilingual Grammar School, Government Technical High School and Summerset Bilingual College, Molyko, Buea. Data was collected using structured pre-tested questionnaires covering Socio-demographic data, sleep quality assessment using the Pittsburg sleep quality index scale (PSQI), knowledge, associated factors and effects on academic performance. Data were analyzed using SPSS version 28.0, with descriptive statistics and chi-square tests used to determine associations at a significant level of $p < 0.05$. Data was presented using tables and pie charts.
Findings: The study found that 67.9% of high school students had good sleep quality and 62.8% of them had good knowledge. The study also found that school related stress ($p<0.001$) and screen exposure before sleep ($p<0.001$) were significantly associated with poor sleep quality. Meanwhile, the study found no significant relationship between self-rated sleep quality and academic performance ($p=0.568$). Rather, daytime sleepiness showed a strong effect with academic performance ($p=0.016$).
Implications to Theory, Practice and Policy: This study emphasizes the need for students to identify and use good practices that will improve their sleep quality, as well as gain more knowledge about sleep quality and its effects to mental health and academic performance.

Keywords:

Sleep quality, Academic performance, high school students, school-related stress, knowledge, associated factors, effects.

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INTRODUCTION

The term "sleep quality" first appeared in a study in psychology published in 1911 by Rowe. He analyzed the sleep of a young boy and an adult and concluded that central consideration is the sleep quality, not the quantity[1]. With the development of physiology and psychology and a rapidly increasing knowledge of the structure and functioning of the nervous system, certain aspects of sleep became accessible to objective study such as the responsiveness to external stimuli during sleep and motor activity across the sleep-wake cycle[2].

Sleep quality is an individual's self-satisfaction with all aspects of the sleep experience[1]. Sleep plays important roles in physical and mental health[3]. It is made up of subjective and objective aspects. The subjective aspect includes how a person feels after waking up and their sleepiness. The objective components of sleep quality include total sleep time, arousal, sleep onset latency and sleep efficiency[1]. The Pittsburg Sleep Quality Scale (PSQI) assesses sleep quality for a period of one month[4].

Contrary to the WHO's recommendation of seven to nine hours of sleep, most young individuals sleep for shorter periods[5]. Poor sleep quality is very detrimental to the health and learning abilities of senior high school students[6]. Sleep quality is very important for the consolidation of memory as the brain processes information during sleep. Therefore, sleep deprivation can impact memory storage, learning ability and academic performance pf high school students[6]. Greater knowledge of sleep hygiene and its importance can promote better sleep habits and improve sleep quality. Those who know more about sleep importance are more likely to prioritize it[7,8].

Adolescents, especially high school students, undergo rapid physical and psychological changes, often leading to behavior and sleep homeostasis changes[9]. Their sleep disturbances are frequently attributed to hormonal changes, academic stressors and evolving social environments, including increased screen exposure[10]. Inadequate sleep leads to increased drowsiness and daytime sleepiness which subsequently decreases mental alertness and consciousness[11,12]. Students with better sleep quality have higher averages compared to those with poor sleep and sleep hygiene practices are important for maintaining academic performance[13].

In Nigeria, 448 adolescents aged between 10 and 19 years were studied with majority of the respondents (85.0%) having poor sleep quality. More than half of the respondents (55.1%) had insufficient sleep during weekdays, while only 34.8% had insufficient sleep during weekends[14]. A study carried out in Bangladeshi provides initial evidence supporting the validity and reliability of a culturally adapted and psychometrically evaluated Bangla version of the PSQI scale as a measure of sleep quality to facilitate high-quality sleep research and clinical application in the Bangladeshi population[15]. As well as an I-PSQI for the Igbo language speakers of Nigeria[16]. For knowledge, Chinese high school students selected the "Very familiar" option giving a result of 40.38%[17]. A study carried out in China indicate that approximately 50% of high school students experience insufficient sleep duration, with academic stress identified as a primary contributing factor[18]. For associated factors, another study in China revealed that interpersonal sensitivity, anxiety, depression, high academic pressure, coffee consumption, alcohol and

smoking, staying up late at night, poor sleep environment and prolonged screen time were risk factors of poor sleep quality among high school students[6]. For effects, a study in Brazil reveals that students with poor sleep quality had lower grade averages($p=0.004$)[19].

Problem Statement

Sleep quality plays a vital role in the academic performance of high school students, alongside other numerous challenges. Despite the need for adequate rest and overall well-being for improved cognitive functioning, many students still suffer from poor sleep quality, irregular sleep patterns and insufficient sleep. These disruptions can negatively affect understanding, concentration, memory, learning and cognitive capacity, and above all, academic success. Therefore, there is an important need to explore students' knowledge of sleep quality, identify associated factors affecting sleep quality, and evaluate the impact of sleep quality on their academic performance.

Research Objectives

General Objective

To determine the sleep quality, knowledge, associated factors and its effects on academic performance among high school students in selected secondary schools in Buea, Cameroon.

Specific Objectives

To evaluate the quality of sleep of high school students in selected secondary schools in Buea.

To assess the level of knowledge of sleep quality among high school students in selected secondary schools in Buea.

To identify the associated factors of sleep quality among high school students in selected secondary schools in Buea.

To determine the effects of sleep quality on the academic performance of high school students in selected secondary schools in Buea.

Research Questions

What is the sleep quality of high school students in selected secondary schools in Buea?

What is the level of knowledge of sleep quality among high school students in selected secondary schools in Buea?

What factors are associated with the sleep quality of high school students in selected secondary schools in Buea?

What are the effects of sleep quality on academic performance of high school students in selected secondary schools in Buea?

Research Hypothesis

$H_{01:}$ The sleep quality of high school students in Buea is low.

$H_{02:}$ The knowledge of Sleep quality amongst high school students in Buea is good.

$H_{03:}$ The factors associated with sleep quality negatively affects academic performance.

$H_{04:}$ The effects of sleep quality on academic performance of high school students are low.

Theoretical Framework

Health Belief Model (HBM)

This theory is chosen for its relevance to the topic showing how knowledge of sleep quality and its affect the students behaviour towards improving sleep quality. The Health Belief Model posits that individuals are more likely to engage in health-promoting behaviors if they believe they are susceptible to a health problem. They perceive the problem as serious, believe that taking a specific action would reduce their susceptibility or severity, and believe that the benefits of taking the action outweigh the costs or barriers[20] [71]. As used by Xinchao Gao et al in China which studied that health belief can significantly improve the sleep quality of students directly and also through physical activity[20] [71].

In 2024 in Antalya Turkey, Dikici H and Kadioglu H used the Health Belief Scale where they stated that for perceived susceptibility, high school students must recognize that poor sleep can lead to academic difficulties and health issues[21]. For perceived severity, the students understand the serious consequences of inadequate sleep, such as cognitive impairment and emotional distress, can motivate students to prioritize sleep[21]. Perceived benefits emphasize that knowledge about how improved sleep quality can enhance concentration, memory, and overall academic performance of students can encourage positive changes in their sleep habits[21]. For barriers to action, identifying obstacles (e.g., social activities, homework load) that prevent good sleep hygiene can help the students in formulating strategies to overcome them[21].

Conclusively, the health Belief Model is chosen in our research to bring clarity to our topic. This theory does not just explain what they know, but also why they do not act on what they know and find ways to overcome them.

2.0 MATERIAL AND METHODS

The study was school based cross-sectional study carried out among high school students in three secondary schools found in Molyko, Buea in the Fako Division, South West Region of Cameroon. The Bilingual Grammar School (BGS) Molyko, the Government Technical High School (GTHS) Molyko and the Summerset Bilingual College(SUBICOL) Molyko Buea. Buea itself lies on the eastern slopes of Mount Cameroon. BGS Molyko is situated directly opposite Government Technical High School Molyko, adjacent to Molyko Omnisport Stadium and GCE Board offices. It is a Government (public) general secondary school having both Anglophones & Francophones with classes from Form 1 to upper sixth. GTHS Molyko is Government technical/vocational secondary school which focuses on practical and technical fields (e.g., mechanics, electricity, building, etc.). Located opposite Bilingual Grammar School Molyko and Catholic University Institute of Buea and surrounded by residential areas and commercial activities. SUBICOL is a private secondary school located at Checkpoint (Wokoko) Molyko situated opposite Enamen Pharmacy Surrounded by shops and pharmacies, traffic junctions and residential buildings. It is positioned along a busy main road linking Molyko to Buea Town.

Data was collected using a well structured questionnaire of close-ended Multiple Choice Questions directed to each research objective in English Language. The questionnaire was subdivided into sections: Socio-demographic data (section 1), sleep quality assessment (Section 2), knowledge about sleep quality (Section 3), Factors affecting sleep quality (section 4), Effects of Sleep Quality on Academic Performance (Section 5). A pretest was done in MACBICCOL Comprehensive Secondary and High School, Great Soppo, Buea.

Administrative Authorization for research was obtained from the Faculty of Health Sciences(2026/056/UB/HOD/NUS/FHS), Ethical Clearance from the Regional Ethics Committee of the South West Region (491/CRERSH/SW/C/04/2026) and authorization from secondary schools authorities. The parents/guardians of participants signed a consent form and were informed of their right to refuse and withdraw from participating in the research without any explanation and had the right to ask any questions at any time. Confidentiality of the participants was respected by not using their names, rather, by using codes and not sharing any information which was obtained.

Data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 28 with descriptive statistics such as Percentage distribution, frequency distribution, and standard deviation was used to analyze the gotten data. Data was presented using tables and pie charts and Chi Square test was used to determine associations at a significant level of $P< 0.05$.

3.0 FINDINGS

A total of 296 students participated in the study. The majority of participants were male (59.5%), while females accounted for 40.5%. Most of the students (78.75%) were aged within the range 15-18 years. Respondents were equally distributed between Lower Sixth (50.0%) and Upper Sixth (50.0%). Most students attended public schools (59.5%), and

the majority resided with their parents (64.5%). Regarding distance from home to school, 38.2% of respondents reported travelling more than 3 km daily (Table 1).

Table 1: Socio-Demographic Characteristics of Respondents (N = 296)

Variable	Category	Frequency (n)	Percentage (%)
Sex	Male	176	59.5
	Female	120	40.5
	Total	**296**	**100.0**
Age (years)	15-18	233	78.7
	19-21	44	14.9
	>22	19	6.4
	Total	**296**	**100.0**
Class/Form	Lower Sixth	148	50.0
	Upper Sixth	148	50.0
	Total	**296**	**100.0**
Type of School	Public	176	59.5
	Private	120	40.5
	Total	**296**	**100.0**
Residence	With Parents	191	64.5
	With Relatives	100	33.8
	Boarding	5	1.7
	Total	**296**	**100.0**
Distance from Home to School	< 1 km	79	26.7
	1–3 km	104	35.1
	> 3 km	113	38.2
	Total	**296**	**100.0**

Sleep quality: Sleep quality was assessed across six indicators: self-rated sleep quality, sleep onset latency, average hours of sleep per night, frequency of difficulty falling asleep, frequency of nocturnal awakening, and perceived restfulness upon waking. Self-rated sleep quality categories were reclassified into two broader groups: Good Sleep Quality (Very Good and Good) and Poor Sleep Quality (Poor and Very Poor). Under this reclassification, **201 respondents (67.9%) reported good sleep quality, while 95 (32.1%) reported poor sleep quality** (Table 2)**.**

Table 2: Sleep Quality Assessment Parameters Among Respondents (N = 296)

Variable	Category	Frequency (n)	Percentage (%)
Self-Rated Sleep Quality	Good	201	67.9
	Poor	95	32.1
	Total	**296**	**100.0**
Sleep Onset Latency(minutes)	< 15	83	28.0
	16–30	136	45.9
	31–60	47	15.9
	> 60	30	10.1
	Total	**296**	**100.0**

Average Hours of Sleep per Night (hours)	< 5	51	17.2
	5–6	97	32.8
	7–8	103	34.8
	> 8	45	15.2
	Total	**296**	**100.0**
Difficulty Falling Asleep	Never	40	13.5
	Sometimes	200	67.6
	Often	56	18.9
	Total	**296**	**100.0**
Waking Up During the Night	Never	20	6.8
	Sometimes	170	57.4
	Often	104	35.1
	Total	**296**	**100.0**
Feeling Rested Upon Waking	Always	64	21.6
	Sometimes	209	70.6
	Never	23	7.8
	Total	**296**	**100.0**

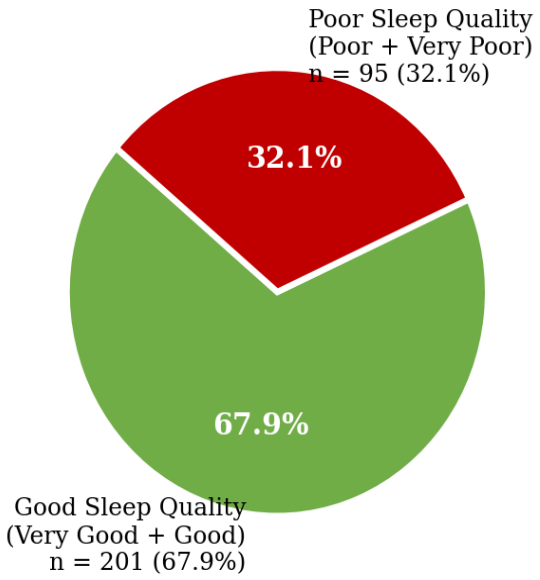


Figure 1: Self-Rated Sleep Quality Among Respondents

Knowledge: Knowledge was measured across seven domains: awareness of sleep quality, correct definition of sleep quality, recommended sleep duration for adolescents, effects of poor sleep on memory and concentration, effects of irregular bedtimes, impact of phone use before bed, and the effect of poor sleep on academic performance. A composite knowledge score (0–7) was computed for each respondent. Scores of four and above were classified as indicative of good knowledge, while scores below four indicated poor knowledge. The mean composite knowledge score was 4.0 ± 1.87. Overall, 186 respondents (62.8%) demonstrated good knowledge of sleep quality, while 110 (37.2%) demonstrated poor knowledge. Responses regarding the definition of sleep quality were obtained only from respondents who reported awareness of sleep quality (Table 3).

Table 3: Distribution of Knowledge of Sleep Quality Among Respondents

Variable	Category	Frequency (n)	Percentage (%)
Awareness of Sleep Quality	Yes	203	68.6
	No	93	31.4
	Total	**296**	**100.0**
Definition of Sleep Quality*	How restful and uninterrupted sleep is	130	64.0
	Number of hours slept only	38	18.7
	Sleeping during the day	20	9.9
	I do not know	15	7.4
	Total	**203**	**100.0**
Recommended Sleep Duration for Adolescents (hours)	8–10	105	35.5
	6–7	117	39.5
	4–5	46	15.5
	I do not know	28	9.5
	Total	**296**	**100.0**
Poor Sleep Affects Memory and Concentration	True	214	72.3
	I do not know	45	15.2
	False	37	12.5
	Total	**296**	**100.0**
Irregular Bedtimes Affect Sleep Quality	True	151	51.0
	I do not know	87	29.4
	False	58	19.6
	Total	**296**	**100.0**
Phone Use Before Bed Affects Sleep Quality	Yes	168	56.8
	No	68	23.0
	I do not know	60	20.3
	Total	**296**	**100.0**
Poor Sleep Can Affect Academic Performance	Yes	216	73.0
	I do not know	49	16.6
	No	31	10.5
	Total	**296**	**100.0**
Overall Knowledge Level (Composite Score 0–7)	Good	186	62.8
	Poor	110	37.2
	Total	**296**	**100.0**

Associated Factors: Table 4 presents the distribution of behavioral and environmental factors that may influence sleep quality. A large proportion of respondents reported using a phone or tablet in bed (67.2%), studying late into the night at least sometimes (89.5%), and experiencing school-related stress at least sometimes (95.3%). Screen use duration was asked only of respondents who reported using a phone or tablet in bed (Table 4).

Table 4: Distribution of Behavioral and Environmental Factors Related to Sleep

Variable	Category	Frequency (n)	Percentage (%)
Phone/Tablet Use in Bed	Yes	199	67.2
	No	97	32.8
	Total	**296**	**100.0**
Duration of Screen Use Before Sleep (hours)	< 1	101	41.4
	1–3	82	33.6
	> 3	61	25.0
	Total	**244**	**100.0**
Caffeinated Drink Consumption	Never	105	35.5
	Sometimes	148	50.0
	Often	43	14.5
	Total	**296**	**100.0**
Studying Late into the Night	Never	31	10.5
	Sometimes	199	67.2
	Often	66	22.3
	Total	**296**	**100.0**
Sleeping Environment	Quiet	130	43.9
	Sometimes Noisy	137	46.3
	Very Noisy	29	9.8
	Total	**296**	**100.0**
Sharing Sleeping Space	Yes	184	62.2
	No	112	37.8
	Total	**296**	**100.0**
Stress Due to Schoolwork	Never	14	4.7
	Sometimes	198	66.9
	Often	84	28.4
	Total	**296**	**100.0**
Anxiety Before Examinations	Never	32	10.8
	Sometimes	191	64.5
	Often	73	24.7
	Total	**296**	**100.0**

Behavioral and environmental factors and self-rated sleep quality association: Chi-square (χ^2) tests were performed to examine the association between behavioral and environmental factors and self-rated sleep quality. Two factors demonstrated statistically significant associations with sleep quality. School-related stress was the strongest predictor of poor sleep quality ($\chi^2 = 35.320$, $p < 0.001$). Among students who often experienced school-related stress, 54.7% reported poor sleep quality, compared to 22.8% among those who sometimes experienced stress and 28.5% among those who never experienced it. The duration of screen use before sleep was also significantly associated with sleep quality ($\chi^2 = 28.863$, $p < 0.001$). Students who used screens for more than three hours before sleep reported poor sleep quality at a rate of 49.1%, compared to 24.8% among those who used screens for less than one hour. Late-night studying showed a near-significant directional trend ($\chi^2 = 11.424$, $p = 0.076$), with students who frequently studied late reporting poor sleep at nearly double the rate of those who never did (48.4% vs 25.8%). The remaining factors: phone or tablet use in bed, anxiety before examinations, caffeine consumption, sleeping environment, and shared sleeping space were not statistically significant (Table 5).

Table 5: Association between selected Behavioral and Environmental factors and self-rated sleep quality

Variable	Category	Very Good (%)	Good (%)	Poor (%)	Very Poor (%)	χ^2	p-value
School-Related Stress	Never	21.4	50.0	7.1	21.4	35.320	< 0.001
	Sometimes	21.2	56.1	17.2	5.6		
	Often	20.2	25.0	35.7	19.0		
Duration of Screen Use Before Sleep	< 1 hour	13.9	61.4	14.9	9.9	28.863	< 0.001
	1–3 hours	13.4	51.2	28.0	7.3		
	> 3 hours	29.5	21.3	31.1	18.0		
Studying Late at Night	Never	19.4	54.8	16.1	9.7	11.424	0.076
	Sometimes	22.1	50.3	18.6	9.0		
	Often	18.2	33.3	34.8	13.6		
Phone/Tablet Use in Bed	No	21.9	53.1	17.7	7.3	3.642	0.303
	Yes	20.6	43.7	24.1	11.6		
Anxiety Before Examinations	Never	25.8	45.2	16.1	12.9	6.661	0.353
	Sometimes	23.0	47.6	21.5	7.9		
	Often	13.7	45.2	26.0	15.1		
Caffeinated Drink Consumption	Never	22.9	39.0	24.8	13.3	8.383	0.211
	Sometimes	23.0	50.0	19.6	7.4		
	Often	9.5	54.8	23.8	11.9		
Sleeping Environment	Quiet	24.6	44.6	18.5	12.3	8.655	0.194
	Sometimes Noisy	19.0	51.1	23.4	6.6		
	Very Noisy	13.8	37.9	31.0	17.2		
Shared Sleeping Space	No	20.9	52.7	16.4	10.0	4.051	0.256
	Yes	21.2	42.9	25.5	10.3		

Effects: Table 6 presents the effects of sleep quality on academic performance among high school students. The mean average score of participants for the previous term was 12.05 ± 2.30. Under reclassification, 147 (49.7%) respondents reported good academic performance, while 149 (50.3%) respondents reported poor academic performance. Regarding daytime functioning, 68.6% of respondents reported sometimes feeling sleepy in class, while 20.6% reported often feeling sleepy. Similarly, 70.9% sometimes had difficulty concentrating in class, and 12.5% often experienced concentration difficulties.

Table 6: Distribution of Academic Performance Indicators Among Respondents

Variable	Category	Frequency (n)	Percentage (%)
Self-Rated Academic Performance	Good	147	49.7
	Poor	149	50.3
	Total	**296**	**100.0**
Frequency of Sleepiness in Class	Never	32	10.8
	Sometimes	203	68.6
	Often	61	20.6
	Total	**296**	**100.0**
Difficulty Concentrating in Class	Never	49	16.6
	Sometimes	210	70.9
	Often	37	12.5

	Total	**296**	**100.0**

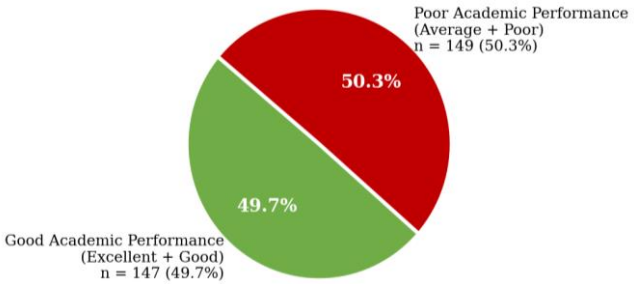


Figure 2 : Self-Rated Academic Performance Among Respondents

Sleep related variables and academic performance: Chi-square (χ^2) tests were conducted to assess the association between sleep-related variables and self-rated academic performance. No statistically significant association was found between self-rated sleep quality and academic performance ($\chi^2 = 7.663$, $p = 0.568$). However, daytime sleepiness in class was significantly associated with academic performance ($\chi^2 = 15.579$, $p = 0.016$). Among students who often experienced sleepiness in class, 71.2% reported poor academic performance, compared to 37.5% among those who never experienced sleepiness. This indicates that the functional daytime consequences of poor sleep, particularly drowsiness during class, have a meaningful and measurable adverse effect on academic outcomes. Difficulty concentrating in class showed a directional trend towards poorer academic performance but did not reach statistical significance ($\chi^2 = 10.427$, $p = 0.108$). Among students who often had difficulty concentrating, 64.9% reported poor academic performance, compared to 47.0% among those who never experienced concentration difficulties.

Table 7: Association Between Sleep-Related Variables and Academic Performance

Variable	Category	Excellent (%)	Good (%)	Average (%)	Poor (%)	χ^2	p-value
Sleep Quality Rating	Very Good	6.5	46.8	33.9	12.9	7.663	0.568
	Good	6.5	45.3	36.0	12.2		
	Poor	3.1	35.4	50.8	10.8		
	Very Poor	3.4	51.7	27.6	17.2		
Daytime Sleepiness in Class	Never	3.1	59.4	28.1	9.4	15.579	0.**016**
	Sometimes	5.9	47.8	35.5	10.8		
	Often	5.1	23.7	50.8	20.3		
Difficulty Concentrating in Class	Never	6.4	46.8	29.8	17.0	10.427	0.108
	Sometimes	6.2	45.2	39.0	9.5		
	Often	0.0	35.1	40.5	24.3		

Discussion

This study assessed the knowledge, associated factors and effects of sleep quality on the academic performance of high school students in three selected secondary schools in Buea, Cameroon. The study comprised of a higher proportion of males (59.5%) to females (40.5%) due to participation rates where male students were more willing and available to participate especially in the science and technical sections and also gender distribution within selected secondary schools. This study is similar to a study by Zhong et al, which had a higher proportion of male students (53.13%) to female students (46.88%)[18]. Also contrary to a study in Oyo State Nigeria by Sunday and Taiwo which had 60.8% female to 39.2% male[22]. The modal age was 14-18 years of 78.7%. The equal distribution between lower sixth and upper sixth participants ensured a balanced representation and reduced bias linked to difference in class. Most of the participants (64.5%) lived with parents which suggests a stable home environment with parental supervision and structured routines. However, poor sleep outcomes were still observed indicating that parental presence alone may not guarantee healthy sleep behaviors and good sleep quality. Also, 38.2% of students travelled more than 3km to school. These long commuting distances may contribute to early wake-up times, physical fatigue and reduced total sleep duration.

There is a mismatch between perception and reality. Although 67.9% rate their sleep quality as good/very good, meanwhile objective indicators showed otherwise such as 50% of respondents slept less than 7 hours, below the recommended sleep duration considered as normal. This is possibly because students have adapted to chronic sleep deprivation and perceived it as normal, societal/cultural acceptance of late-night studying and device use, less sleep duration and lack of awareness of what "sleep quality" constitutes. Like a study by Sunday and Taiwo, in Nigeria where 48.8% of respondents slept less than 6 hours per day[22]. This is contrary to a study by Zhang M et al in China where 24.2% of participants had poor sleep quality[6]. 67.6% of participants sometimes had difficulty falling asleep. 57.4% experienced late night awakeness and 21.6% always felt rested which suggest fragmentation and non-restorative sleep. Could be caused by psychological stress, screen exposure before bedtime, environmental noise and shared sleeping space.

The study found that 62.8% of respondents had good knowledge of sleep quality, indicating a moderate level of awareness. This is like a study by Zhong W et al, where 70% of the participants had sufficient knowledge of sleep disorders and sleep quality[18]. And contrary to a study by Zhong et al among 800 students in China, only 221 participants had sufficient knowledge[18]. However, although 68.8% have heard of sleep quality, only 64.0% correctly defined it as restful or uninterrupted sleep, suggesting that some students possess superficial knowledge without conceptual clarity. This could be because sleep health is not formally taught/emphasized in school curricular and info is acquired informally (peers, social media) leading to misconceptions. Only 35.5% of respondents correctly identified 8-10 hours as recommended sleep duration. The possible reason for this academic gap is because of academic pressure, societal and cultural normalization of sleep deprivation and lack of targeted adolescent sleep health education leading to shorter sleep schedules. 72.3% of respondents recognized that poor sleep affects memory and concentration and 73.0% recognized that poor sleep affects academic performance.

This suggests that students understand the consequences but fail to put into practice their knowledge.

School related stress showed a strong association with poor sleep**(p<0.001)** possibly because of academic pressure, exam anxiety, fear of poor academic performance and overloaded study schedules. Students experiencing frequent stress were significantly more likely to report poor sleep quality. Stress activates physiological arousal making it difficult to initiate and maintain sleep, compared to a study by Zhong et al, which found that 78.38% of participants accepted that academic stress affects their sleep quality[18]. Screen exposure before sleep was significantly associated with poor sleep quality**(p<0.01).** This is because blue light suppresses melatonin production, cognitive stimulation delays sleep onset and social media increase emotional arousal. Students using screen for more than three hours had almost double the rate of poor sleep. Compared to a study by Yara A et al in Saudi Arabia which states that 62.2% of adolescents who used screens for more than 8 hours daily were poor sleepers. 69.3% used screens for 6-8 hours and 20% used screens for less than one hour[23]. Other meaningful patterns include late-night studying, caffeine consumption (contributes to delay sleep onset), Sleep environment (noise and shared space may disrupt sleep). These findings indicate that sleep quality is influenced by multiple interacting factors even when not individually significant.

The mean average was 12.05+- 2.30 indicating moderate performance. The study found no significant relationship between self-rated sleep quality and academic performance(p=0.568). possibly because self-rated sleep quality is subjective and prone to bias. Students may compensate for poor sleep to increase study time and effort and academic performance is influenced by multiple variables before sleep. Similar to a study by Zahra and Shabnam which found no association between quality of sleep and school achievement[24]. Daytime sleepiness showed a strong association with academic performance**(p=0.016)** possibly because of reduced attention span, impaired memory retention, increased classroom disengagement. Students who often felt sleepy were more likely to perform poorly with low average. Similar to existing literature suggesting that functional impairments like sleepiness are more of academic outcomes than sleep duration alone. Contrary to a study by Zahra and Shabnam, 2022 in Iran which states that daytime sleepiness(p=0.002) and school achievement(p=0.001) are predictors of quality of school life. And 6.2% of participants had excessive daytime sleepiness[24].

4.0 CONCLUSION AND RECOMMENDATIONS

Conclusion

This study revealed that the sleep quality of most high school students in Buea have good sleep quality. Most of the students possess good knowledge of sleep but these students possess moderate but incomplete knowledge of sleep quality. For associated factors, the key determinants of poor sleep are school-related stress and excessive screen time, although sleep quality can be affected by multiple interacting factors even when not individually significant . For effects of sleep quality on academic performance, while sleep

quality itself was not directly linked to academic performance, daytime sleepiness significantly affected learning outcomes.

Recommendations

This study has helped to identify the effects of sleep quality on academic performance of high school students. It is of necessity to the students to prioritize 7-9 hours of sleep daily, despite the academic pressure and school related stress and limit screen exposure before bedtime. To the schools, their administrations should integrate sleep education into health programs, curricula and conferences/ health workshops and reduce excessive academic workload. Parents should monitor their children's sleep habits and device use and provide help if any abnormalities are noticed.

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Limitations of the Study

This study was carried out only in three selected secondary schools in the Fako division of the southwest region.

Conflict of Interest

The authors declare that they have no conflicts of interest.

REFERENCES

1. Nelson KL, Davis JE, Corbett CF. Sleep quality: An evolutionary concept analysis. *InNursing forum.* 2022; 57(1): 144-151.
2. Schulz H. The history of sleep and sleep medicine in Europe. *Journal of sleep research*. 2022; 31(4): 13602.
3. Chaveepojnkamjorn W, Srikaew J, Satitvipawee P, Pitikultang S, Khampeng S. Association between media use and poor sleep quality among senior high school students: a cross-sectional study. *F1000Research*. 2023; 8(10): 1116.
4. Kazuhisa M, Shoichiro I, Kenji F, Eriko M, Misato F, Kazuhiko M et al. Hyperthyroidism in Graves' Disease Causes Sleep Disorders Related to Sympathetic Hypertonia Free. *The Journal of Clinical Endocrinology & Metabolism.* 2022; 107(5): 1938–1945.
5. Lehouillier I, Saksvik S, Dahlberg J, Tanum T, Ringen H, Karlsen H et al. Mild to moderate partial sleep deprivation is associated with increased impulsivity and decreased positive affect in young adults. *Sleep Research Society.* 2020; 43 (10): 1-10.
6. Zhang M, Zhou Y, Wang X, Deng G, Zhang Z. Development and validation of a risk prediction model for poor sleep quality among senior high school students in China. Scientific Reports. 2025; 15(1):44756.
7. Hirshkowitz M, Whiton K, Albert SM, et al. Sleep hygiene practices: a systematic review of the literature. Sleep Medicine Reviews. 2020; 52: 49-58.

8. Vusi K. Impact of Sleep Hygiene Education on Sleep Quality in College Students. *Global Perspectives in Health, Medicine, and Nursing.* 2023;2(1):40-50.
9. Salmani A, Shidhani A, Qassabi S, Yaaribi S, Musharfi A. Prevalence of sleep disorders among university students and its impact on academic performance. *International Journal of Adolescence and Youth.* 2020; 25 (1): 974-981.
10. Pascoe C, Hedrick E, Parker G. The impact of stress on students in secondary school and higher education. *International journal of adolescence and youth.* 2020; 25 (1);104-112.
11. Phillips SR, Johnson A, Shirey MR, Rice M. Sleep quality in school-aged children: a concept analysis. *Journal of pediatric nursing*. 2020; 52:54.
12. Reisi M, Jalilian R, Azizi G, Rashti A, Nia J, Akbari M et al. Academic performance, sleep disorders and their association in middle school students in Iran. *International Journal of Pediatrics* 2017: 5 (3); 4541-4549.
13. Lo J, Lee S, Lee X, Cheung F, K Kam J, Lum J, et al. Sleep and academic performance in school-aged children. *Sleep Health*. 2016: 2(3): 247-255.
14. Oluwatosin EO, Funmito OF, Champion SF, Morenikeji AK, Kolawole SM. Sleep quality and its relationship with school schedules and mental health of Nigerian secondary school adolescents. *J Clin Sleep Med.* 2023;19(11):1895–1904.
15. Tarek M, Rafian A, Jayanta P, Fatema K, Mir SZ, Abdullah SK, Mohammad JH. Cross-cultural adaptation and psychometric evaluation of Pittsburgh sleep quality index Bangla (PSQI-BN) in Bangladeshi population. Sleep and Biological Rhythms.2026; 24 (1): 105-113.
16. Uzoamaka NA, Ogechi JO, Sochima JO, Uchenna PO, Ifoema AA, Jovita AD et al. Cross-cultural adaptation and validation of the Pittsburgh Sleep Quality Index (PSQI) in the Igbo language. *Research/Open access.Published:* 2024: 4(1); 154.
17. Yan J, Zhu F, Zhong W, Ding J, Cai X. Knowledge, attitude and practice towards Sleep disorders among high school students: A cross-sectional study. *BioMed Central Pediatrics.* 2025; 25(106).
18. Zhong W, Ding J, Cai X, et al. Knowledge, attitude, and practice towards sleep disorders among high school students: a cross-sectional study. *BioMed Central pediatrics.* 2025: 25 (1); 106.
19. Yasin G, Ozge A, Hakan D. Relationships between Internet addictions, smartphone addiction, sleep quality and academic performance among high school students. *Revista da Associação Médica Brasileira. 2024:* 70:20230868,
20. Dikici H, Kadioğlu H. Development and preliminary psychometric properties of the Scale of Health Belief Model for Sleep. *European Journal of Public Health.* 2024 ;34(3):144-1732.
21. Liu J, Ji X, Pitt S, Wang G, Rovit E, Lipman T, Jiang F. Childhood sleep: physical, cognitive, and behavioral consequences and implications. *World journal of pediatrics.* 2024 ;20(2):122-32.
22. Kaku SI, Eyinade TM. Social Media Use, Sleep Quality, Mental Health and Academic Performance of Public Secondary School Students in Afijio Local Government Area, Oyo State, Nigeria. *Journal of Health Information and Librarianship*. 2025;8(2):29-45.
23. Yara Alshoaibi, Wejdan Bafil, Maheen Rahim. The effect of screen use on sleep quality among adolescents in Riyadh, Saudi Arabia. *Journal of family medicine and primary care.* 2023 12 (7): 1379-1388.

24. Ahmadi Zahrah, Omidvar Shabnam. The quality of sleep and daytime sleepiness and their association with quality of school life and school achievement among students. *Journal of education and health promotion.* 2022;11(1):159.