

Association between Sleeping Pattern, Oral Health Habits and Academic Performance among Dental Students

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Abstract

Background: The level of success that students achieve from education has far associations with the personal, social and professional development. Researchers have connected poor students' achievement with too many factors, among which sleep pattern along with oral health status are less explored to associate with academic performance. **Objective:** To assess the association between sleep pattern, oral health status and academic performance among the group of dental students. **Material and methods:** A descriptive cross-sectional questionnaire study was conducted among dental students of King Khalid University, Abha. Self-administered structured questionnaire was used to assess the sleeping pattern, habits, self-reported oral health status and academic performance. Data description was done for frequency and percentage analysis. Chi-square test was done to test the association between and p-values less than 0.05 were considered statistically significant. **Results:** Among the 135 participants completed the study male participants were 114 (84.4%) while female participants were 21 (15.6%) with 83% between 21 to 25years age group. Most of participants were smokers. Miswak was the most common type of tool used for oral hygiene, 58.5% of participants reported to visit a dentist when needed and gingival bleeding was reported among 46.7%. 6 to 8 hours was the reported sleeping hours per night by most of the participants. The association between academic performance with smoking, frequency of dental visit and repeated awaking during night among the students was found to be statistically significant with p-values less than 0.05. **Conclusion:** The results of this study showed that dental students are unknowingly exposed to unhealthy sleep habits and these difficulties in sleep pattern along with unhealthy oral health habits can influence the academic performance of the students.

Keywords: Academics; Dental; Oral health; Performance; Sleep; Smoking; Students

Introduction

Sleep is a biological need ^[1] and is important for preserving good physical, mental, and emotional health ^[2] along with to establish good quality of life. ^[3] Sleep is important to have good memory, learning skills, critical decision making and thinking. ^[4,5] Sleep related issues are common in general population and around one third of adults population reported to have some form of sleep ailments. ^[6] Studies have found insomnia to be prevalent 32.6% in patients visiting primary care center. ^[7] Professionals such as dental students are exposed to long hours of training and clinical work with high manual dexterity and mental alertness appears to be especially susceptible to poor sleep quality and quantity. ^[8]

Daily 8 hours of night sleep is needed for a normal person to maintain good general health and perform his activities efficiently. ^[9] Studies have found that good quality of sleep is essential for optimal neurocognitive and psychomotor performance. ^[10] Thus, sleep is essential for the optimum operation of basic cognitive tasks related to academic success in clinical oriented education.

Dewald JF et al. in their meta-analysis reported that sleeping habits and pattern have negative effect on school performance in children and adolescents. ^[11] Also, studies have reported sleep disorders tend to increase with age in adults, but young people often suffer from sleep related issues during their school and college years. ^[12] Brown F et al. reported university students at least twice as many have sleep difficulties as the general population according to a study in the United States. ^[13]

Several studies have reported that sleeping habits and pattern are negatively associated with academic performance of students in different populations and academic levels. This in turn affects

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student's physical and mental health, accordingly their working capacity and influence the society in the form of accidents and medical error.^[14-16]

Oral health plays a vital part for good health and quality of life. Quality of life and health are dependent on general wellbeing of the individual which can be harmfully affected by deprived oral health and improper sleeping habits.^[17] Kailash A et al. investigated the association between sleep disturbances, oral health status and academic performance and reported that sleep habits modify the oral health status, habits and academic performance of dental students.^[18]

Many studies have been carried out to identify causal factors of poor academic performance in a various institutions worldwide and most of these studies have focused on the three elements that is, family, academic, and personal causal factors.^[19] The combination of factors influencing academic performance, however, varies from one academic environment to another, from one set of students to the next, and indeed from one cultural setting to another.

Elagra MI et al. reported that dental students tend to have poor sleep quality, which is unknown to them. Poor sleep quality was associated with lower academic performance, especially in clinical years.^[20]

Similar results were reported among medical students by Siddiqui AF et al. that most medical students have a poor sleep quality, which could be related to their sleep habits and concluded that there is a strong need for integrating sleep hygiene education for young students, to improve their sleeping practices and consequent physical and mental health.^[21]

It is important to have information about students sleeping habits because of its negative influence on quality of life, cognitive performance, and health related conditions. Special importance should be given to health associated students, medical and dental owing that, it in turn may affect these students clinical training, cause medical errors, and influence patient safety. To our knowledge, this is the first kind of study about sleeping habits, oral health status and academic performance among dental students for this Southwest region of Saudi Arabia.

Thus, this study was intellectualized with the objective to assess the association between sleep pattern, oral health status and academic performance among the group of dental students, King Khalid University, Abha, Saudi Arabia

Materials and Methods

Study design

This cross sectional descriptive questionnaire based study was conducted among dental students of King Khalid University, Abha, Saudi Arabia. The study was registered and approved by the institutional ethics committee of King Khalid University (SRC/ETH/2018-19/115). The study was conducted in full accordance with the world medical association declaration of Helsinki between March – June 2019. The students were briefed about the objective of the study and their informed consent was obtained for participation. Anonymity and confidentiality of the information were assured and participants were free to withdraw from the study at any stage.

Participant's details

The participants selected for this study were dental undergraduate and post graduate students. Both male and female students were included. Lower levels of under graduate students were excluded from the study because they do not yet have a GPA. Questionnaires were distributed by hand to all participants and asked to fill it and the data was collected. Students diagnosed with sleep disorders or with psychiatric issues were excluded from the study.

Questionnaire

A self-reported questionnaire was constructed for exploring the information about sleeping pattern, oral health habits and academic performance. A clear explanation of the objective of the study and the student consent was included in the questionnaire. Students were asked about their sleep habits and how satisfied they were with their sleep, oral health and academic performance information. Academic performance was measured by the selfreported grade point average (GPA).

Data analysis

Data collected from the questionnaires was entered in excel sheet and was then analyzed with standard statistical software (SPSS, Statistical Package for the Social Sciences, version 22, Chicago, IL, USA). Frequency and percentage descriptive analysis was done and Chi - square test was applied for association analysis were $P < 0.05$ was considered significant.

Results

Amongst the dental students to whom the self-administered questionnaires were distributed, 135 of them completed the study questionnaire. The questionnaires with incomplete or missing responses were excluded from the analysis.

Table 1 shows the basic characteristics of the study participants. A total of 135 undergraduate and post graduate dental students returned completely filled questionnaire forms. Among these, 114 were male and 21 were female participants. The age of the study participants was ranging between 20 and 30 years. 114 students were undergraduate dental students (academic levels 3–12) and 21 were post graduate students. Most of them were smokers.

Table 2 shows the description of oral health habits and their self-assessment of oral health. Miswak was the most common oral hygiene tool used by 49.6% of the participants. 58.5% of the participants reported that they visited the dentist when it was

Table 1: Basic characteristics of study participants.

Variables	N(135)	%age	
Age group	<=20	2	1.5
	21-25	112	83.0
	26-30	18	13.3
	>30	3	2.2
Gender	Male	114	84.4
	Female	21	15.6
Academic Level	UG	114	84.4
	PG	21	15.6
Smoking	Yes	67	49.6
	No	68	50.4

needed, 40% felt good about their oral health assessment, 87.4% and 43.7% were satisfied of their appearance and felt good of their gingival condition. 46.7% of the participants reported that they had gingival bleeding.

Also, the present study results showed that more than 50% study participants slept less than 8 hours per night, 43% described that they have a problem in falling asleep sometimes, 34.8% had disturbed sleep in the night sometimes and 30.4% had difficulty in awaking sometimes [Table 3].

Table 4 and Table 5 show the association between sleep pattern,

oral health habits self-assessment and academic performance of the participants. When assessed the association between sleep pattern and academic performance repeated awaking and well rested awaking results sleeping habits were statistically significant with p-value 0.034 and 0.024. Oral health habits frequency of dental visit and self-assessment of oral health when associated with academic performance showed statistically significant results with p - value 0.029 and 0.013.

Discussion

Dental students are often subjected to substantial theoretical and

Table 2: Description of oral health related information and study participants' self-assessment.

Variables	N(135)	%age	
Hygiene Tool	Toothbrush	17	12.6
	Miswak	67	49.6
	Both	39	28.9
	Nothing	12	8.9
Dental Visit frequency	Every 3 month	6	4.4
	Every 6 months	31	23.0
	Yearly	19	14.1
	When need	79	58.5
Oral Health Assessment	Poor	11	8.1
	Normal	22	16.3
	Good	54	40.0
	Very Good	39	28.9
Satisfied of Appearance	Excellent	9	6.7
	Yes	118	87.4
	No	17	12.6
Feeling of gingival condition	Poor	12	8.9
	Normal	20	14.8
	Good	59	43.7
	Very Good	37	27.4
Gingival bleeding	Excellent	7	5.2
	Yes	63	46.7
	No	72	53.3

Table 3: Description of sleeping habits and pattern of the study participants.

Variables	N(135)	%age	
Sleeping Hours	>6 hours	46	34.1
	7 hours	51	37.8
	8 hours	20	14.8
	9 hours	11	8.1
	10 hours	7	5.2
Failing to asleep	Never	29	21.5
	Seldom	31	23.0
	Sometimes	58	43.0
	Frequently	13	9.5
Disturbed asleep	Always	4	3.0
	Never	25	18.5
	Seldom	42	31.1
	Sometimes	47	34.8
Repeated awaking	Frequently	19	14.1
	Always	2	1.5
	Never	34	25.2
	Seldom	37	27.4
	Sometimes	39	28.9
	Frequently	25	18.5

	Never	28	20.7
	Seldom	31	23.0
Premature awaking	Sometimes	33	24.4
	Frequently	30	22.2
	Always	13	9.6
	Never	35	25.9
Difficulties in awaking	Seldom	23	17.0
	Sometimes	41	30.4
	Frequently	27	20.0
	Always	9	6.7
	Never	38	28.1
Well rested awaking	Seldom	31	23.0
	Sometimes	33	24.4
	Frequently	26	19.3
	Always	7	5.2
	Never	49	36.3
Night mare	Seldom	44	32.6
	Sometimes	30	22.2
	Frequently	6	4.4
	Always	6	4.4
	Never	70	51.9
Heavy snoring	Seldom	45	33.3
	Sometimes	13	9.6
	Frequently	7	5.2
	Always	00	00

Table 4: Association between sleeping habits, pattern and academic performance of the study participants.

Variables	Excellent >90%		Good 75-90%		Fair 60-75%		Poor <60%		Chi sq.	P value	
	N(28)	%age	N(82)	%age	N(23)	%age	N(2)	%age			
Sleeping Hour	>6 hours	11	23.9	28	60.9	6	13.0	1	2.2	5.34	0.945
	7 hours	10	19.6	30	58.8	10	19.6	1	2.0		
	8 hours	4	20	13	65.0	3	15.0	0	0		
	9 hours	3	27.3	5	45.5	3	27.3	0	0		
	10 hours	0	0	6	85.7	1	14.3	0	0		
Failing to asleep	Never	7	24.1	14	48.3	7	24.1	1	3.4	11.26	0.560
	Seldom	10	32.3	16	52.6	5	16.1	0	0		
	Sometimes	8	13.8	41	70.7	8	13.8	1	1.7		
	Frequently	3	23.1	7	53.8	3	23.1	0	0		
Disturbed asleep	Always	0	0	4	100	0	0	0	0	9.14	0.691
	Never	6	24	11	44.0	7	28.0	1	4.0		
	Seldom	9	21.4	28	66.7	5	11.9	0	0		
	Sometimes	10	21.3	30	63.8	6	12.8	1	2.1		
Repeated awaking	Frequently	3	15.8	11	57.9	5	26.3	0	0	18.12	0.034*
	Always	0	0	2	100	0	0	0	0		
	Never	6	17.6	18	52.9	9	26.5	1	2.9		
	Seldom	11	29.7	24	64.9	2	5.4	0	0		
Premature awaking	Sometimes	9	23.1	26	66.7	3	7.7	1	2.6	9.71	0.641
	Frequently	2	8.0	14	56.0	9	36.0	0	0		
	Never	3	10.7	16	57.1	8	28.6	1	3.6		
	Seldom	8	25.8	19	61.3	3	9.7	1	3.2		
Difficulties in awaking	Sometimes	6	18.2	22	66.7	5	15.2	0	0	18.06	0.114
	Frequently	8	26.7	16	53.3	6	20.0	0	0		
	Always	3	23.1	9	69.2	1	7.7	0	0		
	Never	4	11.4	19	54.3	11	31.4	1	2.9		
	Seldom	5	21.7	17	73.9	1	4.3	0	0		
	Sometimes	13	31.7	20	48.8	7	17.1	1	2.4		
	Frequently	3	11.1	20	74.1	4	14.8	0	0		
	Always	3	33.3	6	66.7	0	0.0	0	0		

Well rested awaking	Never	5	13.2	24	63.2	9	23.7	0	0	23.53	0.024*
	Seldom	7	22.6	16	51.6	8	25.8	0	0		
	Sometimes	13	39.46	17	51.5	1	3.0	2	6.1		
	Frequently	2	7.7	20	76.9	4	15.4	0	0		
	Always	1	14.3	5	71.4	1	14.3	0	0		
Night mare	Never	8	16.3	29	59.2	12	24.5	0	0	15.50	0.215
	Seldom	13	29.5	27	61.4	2	4.5	2	4.5		
	Sometimes	5	16.7	18	60.0	7	23.0	0	0		
	Frequently	1	16.7	3	50.0	2	33.3	0	0		
	Always	1	16.7	5	83.3	0	0	0	0		
Heavy snoring	Never	17	24.3	41	58.6	12	17.1	0	0	11.35	0.252
	Seldom	7	15.6	30	66.7	6	13.3	2	4.4		
	Sometimes	2	15.4	6	46.2	5	38.5	0	0		
	Frequently	2	28.6	5	71.4	0	0	0	0		

*p<0.05; Significant; **p<0.001; Highly significant

Table 5: Association between oral health habits, self-assessment and academic performance of the study participants.

Variables	Excellent >90%		Good 75-90%		Fair 60-75%		Poor <60%		Chi sq.	P value	
	N(28)	%age	N(82)	%age	N(23)	%age	N(2)	%age			
Hygiene Tool	Toothbrush	1	5.88	13	76.47	2	11.7	1	5.88	20.4	0.060
	Miswak	14	20.9	41	61.2	11	16.4	1	1.5		
	Both	11	30.55	24	61.53	4	10.25	0	0		
	Nothing	2	16.7	4	33.3	6	50	0	0		
Dental Visit frequency	Every 3 month	0	0	0	0	3	100	0	0	22.8	0.029*
	Every 6 months	7	22.6	21	67.7	3	9.7	0	0		
	Yearly	4	21.1	12	63.2	3	15.8	0	0		
	When need	17	21.5	48	60.8	12	15.2	2	2.5		
Oral health assessment	Poor	1	9.1	6	54.5	4	36.4	0	0	25.3	0.013*
	Normal	4	18.2	12	54.5	6	27.3	0	0		
	Good	5	9.3	36	66.7	12	22.2	1	1.9		
	Very Good	13	33.3	24	61.5	1	2.6	1	2.6		
Satisfied of appearance	Excellent	5	55.6	4	44.4	0	0	0	0	2.69	0.975
	Yes	26	22	69	58.5	21	17.8	2	1.7		
	No	2	13.3	11	73.3	2	13.3	0	0		
Feeling of gingival condition	Poor	4	33.3	5	41.7	3	25.0	0	0	16.9	0.153
	Normal	3	15.0	11	55	6	30	0	0		
	Good	8	13.6	38	64.4	12	20.3	1	1.7		
	Very Good	9	24.3	25	67.6	2	5.4	1	2.7		
Gingival bleeding	Excellent	4	57.1	3	42.9	0	0	0	0	4.58	0.869
	Yes	9	17.0	33	62.3	10	18.9	1	1.9		
	No	16	24.6	40	61.5	8	12.3	1	1.5		

*p<0.05; Significant; **p<0.001; Highly significant

clinical training at the same time yields with heavy stress on students and strains with long hours of training and practice. This in turn requires high levels of concentration and manual dexterity.^[8]

During past few decades, many studies have determined that sleep pattern disorders and irregular sleeping habits are negatively related to oral health status and academic performance of students in different people and academic levels.^[22,23]

Thus, this present study was conducted with the objective to assess the association between sleep pattern, oral health status and academic performance among the group of dental students, King Khalid University, Abha, Saudi Arabia using a self-administered questionnaire.

The results of this present study showed that most of the students participated in the study had around 7 hours sleep hours per night which was similar to the finding of the study reported by

Gilbert et al.^[24] whereas Elagra et al. in their study reported less hours of sleep per night compared to our study.^[20] However, 8 hours of night sleep daily is reported from studies is needed to maintain good general health.^[9]

Individuals who have history of sleep ailments usually suffer from stress, anxiety or fatigue which in turn can influence the proper performing of daily oral hygiene methods. This can have the end results of having poor oral health status. However, the results of our study showed no significant association between sleep pattern and oral health habits whereas, previous studies by Yuen et al.^[25] and others have contradicted our results.^[18,26-28]

Similarly, abnormal sleep and oral hygiene habits have impact of the academic performance of the students. Studies have reported that disturbances in sleep are responsible for poor academic performance in students.^[29-31] This findings are in accordance with the results of our study were repeated awaking and well rested awaking had significant association with the

academic performance of the students. Also frequency of dental visit and self-reported oral health assessment had significant association with academic performance of students in our study.

Sleep pattern and quality should be reflected as a significant concern for university students, as both oral hygiene maintenance and academic performance can be influenced by it and affects their mental functioning. Results from study done by Sarita and Sukhwant reported that sleep hours during night while examination time was found to be significantly reduced as compared to usual days.^[32]

Literature with respect to assess the association between sleep pattern, oral health status among a dental student, in specific in Saudi Arabia and its effect on academic performance is lacking. In light of the results presented in this present study, the students are unknowingly explored to some or the other sleep ailment and this can be taken as a worrying state that might influence the academic performance as well as their general and oral health.

However, the present study has few limitations. As the oral health status, academic performances were solely established on the self-reporting. Clinical or objective investigation should have been done to confirm it. Also, there can be other significant factors affecting the sleep habits, oral health status and academic performances which were not considered in this study. So, the results found this study are merely on subjective perceptions. However further researches should be conducted to authenticate our findings.

To the best of our knowledge, the present study is one of its kinds to assess the association of sleep pattern, oral health status and academic performance of dental students. Hence, from the finding of this study it can be recommended that proper sleep habits with healthy oral hygiene maintenance should be given importance to accomplished a healthy lifestyle and have good academic achievements.

Conclusion

Based on the results of this study, dental students participated in the study questionnaire are unknowingly exposed to some sleep ailments. Also sleep pattern can significantly influence the oral health status and academic performance of the students. As the structure of the dental course in King Khalid University is similar to dental courses in other parts of Saudi Arabia thus, the findings of this study can be generalized to dental students across Saudi Arabia. Thus awareness should be raised about the importance of healthy sleep and its dangerous effects on general and oral health among students and faculty members. And also the students should be informed to follow healthy sleep pattern to improve academic performance.

Author Contributions

MAJ, RA and AG conceived the study. RA, AG, MAJ and AA conducted research, provided research materials, and collected and organized data. RA, MAJ and AA analyzed and interpreted data. AA, RA, MAJ and AG wrote initial and final draft of article and provided logistic support. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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Competing Interests

The authors declare that they have no competing interests.

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