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Sleep Medicine Knowledge among Medical Students in Seven Egyptian Medical Faculties

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Abstract

Introduction: Egyptian medical education system awards students the bachelor degree of medicine after six academic years and a rotating house-officer year. There are no structured sleep educative programs in Egypt.

Aim of work: This study aimed to assess the knowledge of Egyptian final year medical students and house-officers about normal sleep and sleep disorders.

Subjects and methods: Medical schools distributed throughout Egypt were surveyed asking sixth year medical students (males and females) and house-officers to participate. Seven faculties of medicine were selected. To screen for knowledge on normal sleep and sleep disorders, the Assessment of Sleep Knowledge in Medical Education Survey was used; the participants were classified to low scorers versus high scorers depending upon their ability to answer 60% of the questions correctly.

The participants were separated into comparative groups (males vs. females). 6th year students vs. house officers and according to their faculty location.

Results: A total of 726 participants completed the survey (52.8% males, 78.9% were 6th year medical students and 21.1% were house-officers). There was a statistically significant difference in the scores of the participants with regard to their Faculty location and gender, while no statistically significant difference was found with regards to the study year.

Conclusion and recommendation: Medical students in the screened Egyptian faculties possess poor knowledge about sleep medicine, which reflects the deficient educative processes in this field of medicine. Medical faculties should provide better sleep medicine education through a formal sleep medicine degree-awarding program.

Keywords: Sleep education; Sleep medicine awareness; Medical education; Sleep medicine knowledge

Introduction

Sleep disorders are highly prevalent disorders that affect nearly all age groups, and are associated with decrements in perceived health [1]. The International Classification of Sleep Disorders-3 (ICSD-3) classifies over 80 different sleep disorders, which can be diagnosed and treated [2].

Obstructive sleep apnea (OSA), which is one of the commonest sleep problems affecting approximately 4% of middle-aged males, has been associated with several serious medical co-morbidities such as hypertension, coronary artery disease, stroke and diabetes [3] which can be missed when physicians do not have enough training or education in the field of sleep medicine.

Sleep disorders are common in the Egyptian population. It was reported that the prevalence of sleep paralysis is about 44% [4]. Moreover, Allah et al. [5] reported that insomnia among elderly Egyptians was about 33.6%. A study conducted by Shaheen et al. [6] demonstrated that 42.3% of patients with epilepsy who attended the outpatient neurology clinic at Fayoum University in Egypt had OSA.

Elawady [7] reported that 30.1% of hospital based patients in Egypt have OSA. Thus, a large number of Egyptian patients with sleep complaints remain undiagnosed, which is most probably due to inadequate sleep medicine education and training among healthcare providers [8].

Sleep disorders clinics were established in the USA and some European countries in 1970s. In 1990, 37% of American medical schools offered no formal education in sleep medicine [9].

Egypt requires 6 years of undergraduate study to become a house officer and a 7th year of clinical rotations to become a general practitioner [10]. Given the effect that sleep disorders have on the health and well-being of a significant percentage of the society, it is frustrating to know that little structured time is given to these topics in the medical school curriculum. Physicians-regardless of specialty-will inevitably gets in touch with patients having sleep complaints and should have the knowledge and awareness to diagnose them.

Several studies have assessed the status of sleep medicine knowledge worldwide; however, none has been conducted in Egypt, which is considered one of the influential countries in the Arab world, Africa and the Middle-Eastern region.

Therefore, we conducted a survey to assess the knowledge of sixth year medical students and house officers about sleep and sleep disorders and the current time given for sleep medicine education in Egyptian medical schools and whether the findings will differ from worldwide statistics gathered about the same topic.

Subjects and Methods

Study population

The study was conducted between January 2015 and June 2015. The Ethics Committee of Mansoura Faculty of Medicine approved the study protocol, and informed consent was obtained from all participants. We targeted faculties of medicine distributed throughout the country that have been established over 30 years ago.

Seven medical faculties satisfying this criterion were selected including: Alkasr Elainy University (KAU), Ain Shams University (ASU), Mansoura University (MU), Zagazig University (ZU), Tanta University (TA), Banha University (BU), Menofia University (MeU). Sixth year (final year) medical students and house officers were invited to participate.

Participants were informed that their completion of the survey was purely voluntary and would take 30 min. They were also informed that responses would remain confidential and anonymous. Among the surveyed students and house officers, 726 agreed to participate in the study.

Questionnaire

The questionnaire for medical students comprised demographics, including age, gender, nationality and academic year.

Knowledge in sleep medicine was assessed using the Assessment of Sleep Knowledge in Medical Education (ASKME) Survey, which is a validated tool for the assessment of medical education in sleep [11].

Medical education is offered in English in all the included Egyptian universities; therefore, there was no need to translate the questionnaire into Arabic. The ASKME survey is a validated 30-item questionnaire that includes five separate areas of sleep knowledge: 1) basic sleep principles, 2) circadian sleep/wake control, 3) normal sleep architecture, 4) common sleep disorders and 5) the effects of drugs and alcohol on sleep.

The items were presented in a "true," "false" or "I don't know" format. The questionnaire has a high degree of internal consistency reliability and validity. The total score is determined by simply adding the correct answers.

The ASKME was administered primarily via a dedicated Internet Web site designed by the study team. A hard-copy version of the instrument was available for students who did not have access to the electronic version. For this subcategory of respondents, feedback was provided by hard-copy answer sheets and responses were manually entered into the database.

Participants were divided into two groups: those who scored ≥60% (the "high score group") and those who scored <60% (the "low score group"), since the pass sore in Egyptian universities is 60%.

A total of 726 respondents completed the ASKME. Respondents were divided into two groups: 1) Sixth-year medical students (n = 573); 2) house officers (n = 153).

Statistical analysis

Continuous data are presented as means ± standard deviations (SD), and categorical data are presented in the text and tables as an absolute number (n) and percentage (%). The continuous variables were compared using the independent samples t-test, and the categorical variables were compared using the chi-square (χ^2) test.

A p value ≤0.05 was considered to be significant. Standard statistical software (SPSS: Statistical Package for the Social Sciences, 20, Chicago, Illinois, USA) [12] was used for the data analysis.

Results

The participants had a mean age of 22.69 ± 2.44 years, and males represented 52.8% of the sample. Students from the Capital universities (Ain Shams and Elkasr Elainy were n = 223).

The responses were distributed as follows: Mansoura University (MU) = 103, Tanta university (TU) = 98, Ain shams University (ASU) = 119, Elkasr Elainy (KAU) = 104, Banha university (BU) = 100, Menoufia (MeU) = 105, and Zagazig university (ZU) = 97.

Final year (sixth year) students were 573 (78.9%), and house-officers were 153 (21.1%). Demographic features and sample characteristics are presented in Table 1.

The Mean total score for female students was slightly higher than that of males (12.3 and 11.17, respectively) there was a significant statistic difference among both sexes on the means of total score (p = 0.018) Table 2. On analyzing scores across the university location the range of means for the total score was variable.

The lowest mean was Zagazig University (9.4) while the highest mean was Mansoura university (12.3) and a statistical difference existed between the total score of the students according to their university location (p = 0.006).

On the other hand, there was no obvious difference in the means of the total scores across the study year (p = 0.6). Around 35.1% of the sample obtained a score range 1-10, 61.7% obtained a score range 11-20 and only 2.5% of the sample obtained a score range from 21-30. Means and standard deviations, minimums and maximums and ranges of the total ASKME scores are presented in Table 2.

Age in years	**Mean ±SD**	22.69 (±2.44)	
	Min	20	
	Max	32	
Student's nationality		**Number**	**%**
	Egypt	689	94
	Malaysia	3	0.4
	Palestine	18	2.5
	Sudan	3	0.4
	Saudi Arabia	2	0.3
	Others	11	1.5
Study year	6th year (final)	573	78.9
	House officer	153	21.1
Gender	Males	383	52.8
	Females	343	47.2
Faculty	Mansoura	103	14.18
	Tanta	98	13.22
	Ain-Shams	119	16.39
	Elkasr-Elainy	104	14.32
	Banha	100	13.77
	Menoufia	105	14.46
	Zagazig	97	13.36

Table 1: Demographics & sample characteristics.

		Mean(SD)	Min	Max	p
Gender					
	Male	11.17(4.4)	0	24	0.018
	Female	12.3(4.2)	1	22	
Study year					
	Final year	11.6(4.4)	0	22	0.63
	House-officers	11.8(4)	2	24	
University					
	Mansoura	12.3(4.9)	0	22	0.006

	Tanta	13.7(4)	4	24	
	Ainshams	13(3.4)	5	21	
	Alkasr-alainy	11.6(3.8)	0	22	
	Banha	9.9(3.6)	0	17	
	Menoufia	11.3(4.5)	1	22	
	Zagazig	9.4(4.4)	0	19	
Frequency distribution of score ranges					
Total score(1-10)			256(35.1%)		
Total score(11-20)			451(61.7%)		
Total score(21-30)			18(2.5%)		

Table 2: Means and standard deviations and ranges of total scores on the ASKME according to gender, study year and faculty location.

The participating students were divided into two groups. The low scorers (<60% correct answers) were 663 forming around 91% of the total sample. While high scorers (>60% correct answers) were 63. Table 3 presents the percentage of high scorers versus low scorers rated by their gender, study year and faculty location.

Gender and faculty location had significant differences in the numbers and percentages of high versus low scorers (p = 0.01, p = 0.00 respectively) Table 3, while there was no statistically significant difference between both study year groups (i.e., final year and house officers) as regard their scores on the ASKME (p = 0.46).

	Low scorers	**High scorers**	**p**
	n(%)	**n(%)**	
Male	359(49.4)	24(3.3)	0.01
Female	304(41.9)	39(5.4)	
Final year	524(72.2)	49(6.7)	0.46
House-officers	139(19.1)	14(1.9)	
Mansoura	89(12.3)	14(1.9)	0
Tanta	78(10.7)	18(2.5)	
Ainshams	108(14.9)	11(1.5)	
AlkasrAlainy	99(13.6)	5(0.7)	
Banha	99(13.6)	1(0.1)	
Menoufia	94(12.9)	11(1.5)	
Zagazig	94(12.9)	3(0.4)	
Total	663(91.5)	63(8.5)	

Table 3: The numbers and percentage of high and low scorers across sex, academic level and faculty location.

The Percentage of correct answers obtained on each question in the ASKME survey is summarized in Table 4. A significant difference was observed between males and females in nine out of 30 questions. However, on comparing universities to each other the difference was significant in twenty out of the thirty survey questions. When we compared capital based universities (Ainshams and Alkasr-Elainy) to universities in other districts or governorates away from Cairo, there was no statistically significant difference (p = 0.2) (Table 4).

University /Variable	High scorers >60% correct answers	Low scorers <60% correct answers	Total	p-value
Capital universities (Alkasr ElAiny and Ein Shams)	207	16	223	0.2
Universities outside the capital (Governates)	456	47	503	
Total N	663	63	726	

Table 4: Difference between capitals based universities and governorates universities.

Discussion

This study demonstrates that the knowledge of sleep medicine among Egyptian medical students is limited. Furthermore, the results showed no statistically significant difference in medical students' knowledge in Egyptian medical faculties located in the capital and universities located in smaller cities. We aimed to check whether sleep medicine field is given more attention in capital based universities which attract larger number of students and are more prestigious regarding their ranking over the Egyptian universities and Africa but the results showed equality in student's knowledge.

There is no professional certification program for sleep medicine in Egypt. A limited number of physicians in Egypt have been trained in sleep medicine and the majorities have received their training abroad and through affiliation with international universities worldwide.

According to the geographic location and study year, there was no difference in the knowledge between final year students and house officers. The research team assumed that house-officers might show more knowledge regarding sleep medicine since they are more exposed to the clinical setting during their year of clinical rotations and the possibility of encountering a patient with sleep complaints is higher. Nevertheless, the results showed no significant differences between the two groups.

It is obvious that sleep medicine education is defective and insufficient. Students who scored high, most likely acquired knowledge through self-efforts due to their personal interest in the field. Additionally, some students direct their efforts toward passing the PLAB or the USMLE which makes them more knowledgeable in fields that are not sufficiently covered within the Egyptian curricula. No study has assessed sleep medicine knowledge among medical students in different academic years in Egypt. In the current study, only 8.5% of participants correctly answered ≥60% of the questions. Previous studies reported similar results in different countries. Table 4 summarizes the results obtained from similar studies worldwide. We concentrated on studies involving medical students rather than studies involving physicians of postgraduate or specialty training. In a study that assessed the knowledge of sleep medicine among medical students in Singapore, researchers reported that less than 10% of medical school seniors scored >70% on questions in sleep medicine [13]. In another study only 2% of third and fourth year medical students, when tested, scored >66% in basic sleep medicine knowledge [14]. A third study found that second year medical students and physician specialists recorded an equally poor knowledge of sleep medicine [15]. Other medically related fields reported a similar lack of education in sleep medicine, indicating inadequate sleep medicine acquaintance for physicians during undergraduate education and even in the postgraduate training period [15]. The two remarkable studies to date, which investigated the inclusion of education about sleep and sleep medicine, were conducted in 1979 by Orr [16], and again in 1993 [17]. The latter study found that less than 2 hours of sleep education was typically provided during medical school and approximately 30% of schools provided no formal education. Furthermore, surveys of practicing physicians and pediatricians find greatly limited sleep knowledge, therefore further emphasizing the need for education on sleep and sleep disorders during medical education [18-20].

Findings of this research study are also in concordance with the few studies that have been conducted in countries outside the United States. It was a noticeable finding that inadequate knowledge about sleep and sleep disorders is widespread. For example, 160 physicians attending a pulmonary conference in Pakistan were found to have very limited knowledge of sleep apnea [21]. A group of 215 physicians in Turkey received an average score of 47% on a questionnaire assessing on knowledge about sleep [22]. Another study noted that only 15% of 209 physicians in Saudi Arabia had ever even attended a lecture on sleep [23]. Clearly, there is a great need for advancement of sleep education in medical education in this region of the world. The average amount of time spent on sleep education in Saudi Arabia was just under 2.5 h, with 27% responding that their medical school provides no education regarding sleep. Even more striking were the country-based findings, with three countries (Indonesia, Malaysia and Viet Nam) providing no education, and only Australia and the United States/Canada providing more than 3 h [19].

In Egypt and the Middle East, medical student's exposure to the sleep medicine during medical training remains limited with no professional sleep medicine programs in majority of universities or clinical fellowships. For example, undergraduate medical students in Mansoura and Ain Shams University learn about sleep medicine for the first time in the second year of their education where they attend an hour lecture introducing the basic concepts of normal sleep during included in the curriculum of behavioral science. The second exposure to sleep medicine is during their internal medicine rotation where they have two lectures; one hour for sleep disorders during psychiatry clinical rounds and another hour for sleep-related breathing disorders during pulmonary medicine clinical rotations. However, the average sleep education hours are only 2.5 hrs. At the residency level, sleep medicine is not considered a core educational requirement for several of the primary specialties, such as Internal Medicine, Surgery, and Family Medicine in Egypt this is similar to findings of Simmons [24]. The current organizational structures do not facilitate ideal care for patients with sleep problems. It is not appropriate to restrain clinical training in sleep medicine given the high public health burden of sleep disorders,

Despite brief education, some students could complete the first two years of training without being introduced to the concept that a medical sleep specialist can diagnose and treat conditions that affect sleep and vigilance. This is similar to what has been reported earlier

[25] that the absence of rotations through an integrated sleep medicine experience does not allow students to ratify their solid impression, or obtain a proper idea of what specialization in sleep medicine might be like. Additionally, Teodorescu [26] reported that sleep medicine occupied only <2% of the content in 31 textbooks on four major specialties related to sleep medicine, which included (neurology, psychiatry, pulmonary medicine and geriatrics). During 5 years of undergraduate medical education in Saudi Arabia, Almohaya et al. [8] reported that fewer than 3 hours were assigned to teaching sleep medicine. Simmons [24] found that the average number of educational hours was 3.92 h for the schools with curriculum time in Sleep Medicine, (2.96 h across all 49 responding schools). The same was found in China where Luo [27] revealed that Chinese medical students had little knowledge about sleep disorders. Similar results were reported among Nigerian students as well [28]. The Institute of Medicine (IOM) report suggested that sleep medicine exposure should begin prior to entering into residency and early on as part of the medical school curricula [29].

The suggested solutions as proposed by Quane [30] include incorporating basic sleep science topics into the educational curricula of the preclinical years (such as physiology, neuro-anatomy, neurochemistry and neuroscience), integrating sleep history and physical signs and examination into clinical medicine and integrating sleep disorders into problem-solving and clinical training sessions.

This study clearly suggests that sleep medicine education in Egypt is inadequate. However, there are limitations of this study that need to be acknowledged, and an additional exploration of this topic is necessary in an equal sample of both sexes. An in depth evaluation could have enriched results by screening undergraduates at different years including all six academic years. Moreover, we did not obtain formal reports about sleep medicine curricula in each medical school nor did us interview staff members responsible for teaching sleep medicine. We did not survey for the abilities of medical students and physicians to understand the medical comorbidities and health hazards that can be caused by sleep disorders which should be a goal of future research studies.

Sleep disorders pose a significant burden on individuals and the healthcare system. Enhanced training similar to that available in the US is well needed in our medical school training.

Conclusion and Recommendations

Medical students in the screened Egyptian universities possess poor knowledge about sleep medicine, which reflects the inadequate educational activities in this field of medicine. In order to improve the recognition of sleep disorders among practicing physicians and medical students, universities and medical faculties must provide adequate sleep medicine education through a formal sleep medicine degree-awarding program. Further steps should be taken by the authorities to include sleep medicine as a subspecialty of Egyptian postgraduate clinical training. Medical students should also learn about sleep and sleep loss in order to regulate their own sleep effectively. The challenges of teaching medical students sleep medicine can best be met by actively integrating information about sleep and sleep disorders into the existing medical school curriculum.

Author Contribution

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Critical revision: Nevin Zaki, Russel Rosenberg, Heidy Reiny, Ahmad Bahammam.

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