ORIGINAL ARTICLE

Impact of Twitter and WhatsApp on Sleep Quality among Medical Students in King Khalid University, Saudi Arabia

Abdullah K Asiri^{1*}, Metrek A Almetrek², Awadh S Alsamghan³, Ossama Mustafa⁴, Sami F Alshehri⁵

¹Faculty of Medicine, King Khalid University, Abha, Saudi Arabia

²Ministry of Health, Abha, Saudi Arabia

³Family Medicine Department, Faculty of Medicine, King Khalid University, Abha, Saudi Arabia

⁴Community Medicine Department, Faculty of Medicine, King Khalid University, Abha, Saudi Arabia

⁵Faculty of Medicine, King Khalid University, Abha, Saudi Arabia

ABSTRACT

Background: Twitter and WhatsApp may have the potential to negatively affect quality of sleep.

Aim of Study: To assess the impact of using social media (i.e., Twitter and WhatsApp) on sleep quality and to identify risk factors associated with poor sleep quality among medical students in King Khalid University (KKU).

Methodology: Following a cross – sectional design, 286 medical students at King Khalid College of Medicine, Abha, Saudi Arabia, were recruited into this study. An anonymous self-administered questionnaire has been designed by the researchers which included sociodemographic data, extent of using the WhatsApp and/or Twitter and the Pittsburgh sleep Quality Index.

Results: 76.2% of students use both Twitter and WhatsApp, 21.5% use WhatsApp only, 1% use Twitter only, while 1% do not use any. Most medical students (89.8%) use Twitter/WhatsApp every day. Most medical students use Twitter/WhatsApp for 3-4 or more than 5 hours daily (31.1% for both). Most medical students (88.7%) use Twitter/WhatsApp during night. 29.7% of medical students have poor quality of sleep. Twitter/WhatsApp use was significantly more among female than male medical students (81.7% and 73.1%, respectively, $p=0.014$). Use of Twitter/WhatsApp by medical students differed significantly according to their scholastic year ($p=0.014$), with highest use among 6th year medical students (94.1%). Medical students' quality of sleep differed significantly according to their scholastic year ($p=0.02$), with highest prevalence of poor quality among those at their 2nd and 6th scholastic years (37.7% and 37.3%, respectively). Quality of sleep differed significantly according to students' daily use of Twitter/WhatsApp ($p=0.022$), with highest prevalence of poor sleep quality among those who spend more than 4 hours daily using Twitter/WhatsApp.

Conclusions: The majority of medical students in KKU, especially females and final year students, use Twitter and/or WhatsApp. Almost one third of students have poor sleep quality, especially 2nd and final year medical students and those who use social media for more than two hours daily. This study indicates a strong need for integrating sleep hygiene education for medical students and to provide health education to promote correct and effective use of social networks.

Keywords: social networking, sleep quality, medical students

INTRODUCTION

Twitter and WhatsApp are among the most popular free social media communication phone applications

*Correspondence: glaid98@gmail.com

Abdullah K Asiri, Faculty of Medicine, King Khalid University, Abha, Saudi Arabia

Received: 06 October 2017 Accepted: 24 November 2017

Sleep and Hypnosis

Journal homepage:

www.sleepandhypnosis.org

ISSN:1302-1192 (Print) 2458-9101 (Online)

(WERSM, 2017). However, these two applications may have the potential to negatively affect quality of sleep (Afandi et al., 2013).

Sleep quality is defined as "one's satisfaction of the sleep experience, integrating aspects of sleep initiation, sleep maintenance, sleep quantity, and refreshment upon awakening" (Kline, 2013). Such Quality of sleep was reported to influence the functional, academic, and social performance (Ahrberg et al., 2012).

Based on the International Classification of Sleep Disorders, third edition (Ito and Inoue, 2015), insomnia

is a complaint of difficulty in falling asleep, difficulty maintaining sleep, or waking up too early (Roth, 2007). Insomnia symptoms impose daytime consequences and impairments associated with sleep disturbances (e.g., fatigue, change in mood, daytime sleepiness or cognitive difficulties). Based on dissatisfaction of sleep, insomnia affects 8–18% of the general population (Ohayon, 2002).

In the Kingdom of Saudi Arabia (KSA), approximately 40% of adults with insomnia also have comorbid medical or psychiatric disorders (Roth, 2007).

The researchers observed that many medical students in King Khalid University (KKU) very frequently use Twitter and WhatsApp. Some of these students used to arrive to the medical college late or even miss their first lectures.

Therefore, this study aimed to assess the impact of using social media (i.e., Twitter and WhatsApp) on sleep quality and to identify risk factors associated with poor sleep quality among medical students in King Khalid University (KKU).

METHODOLOGY

This study was conducted during the academic year 2015-2016. It included students in King Khalid University (KKU) within Abha City, Saudi Arabia. The campus for male students is located in the Griger District, while that for female students is located in Al-Samer Academic Center.

First (preparatory)-year medical students were excluded from this study since they start studying medically-related subjects by their second scholastic year. Also were excluded those students with medical conditions associated with insomnia (e.g., chronic pain), current use of stimulant medications (e.g., methamphetamines), and those who use caffeine beverages (e.g., tea and coffee, energy drinks) at night.

Following a cross – sectional design, medical students at King Khalid College of Medicine, Abha, Saudi Arabia, were recruited into this study by simple random sampling, with 20% sampling fraction. Out of a total of 1838 second to sixth-year medical students (625 females and 1213

males) registered in KKU during the academic year 2015-2016, 286 medical students (104 females and 182 males) were included (i.e., 78% response rate).

Based upon review of relevant literature, an anonymous self-administered questionnaire has been designed in English Language by the researchers. It included the following 3 parts:

- Sociodemographic data (i.e., age, gender, grade point average (GPA), present medical history, intake of stimulants and caffeinated beverages at night.
- Extent of using the WhatsApp and/or Twitter.
- The Pittsburgh sleep Quality Index (PSQI): It measures the quality and patterns of sleep. It differentiates "poor" from "good" sleep by measuring seven areas: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction over the last month. Scoring of answers is based on a 0 to 3 scale, whereby 3 reflect the negative extreme on the Likert Scale. A global sum of "5" or greater indicates a "poor" sleeper. Reliability and validity of PSQI produced a sensitivity of 89.6% and a specificity of 86.5% of patients versus control subjects. This cutoff score correctly identified 84% of patients with disorders of initiating or maintaining sleep, 89% of patients with disorders of excessive sleepiness, and 97% of depressed patients (Buysse et al., 1989).

Face and content validity of the study questionnaire has been assessed by three professors of community medicine the KKU.

The Statistical Package for Social Sciences (SPSS version 23.0) was used for data entry and statistical analysis. Descriptive statistics (i.e., frequency percentage, mean and standard deviation) were calculated. Tests of significance were applied, i.e., Chi square, independent sample t-test and one-way analysis of variance (ANOVA) were applied to test significance of differences. P-values less than 0.05 were considered as statistically significant.

RESULTS

Table (1) shows that about one third of medical students (36.4%) were females. Students' age (Mean±SD)

Table (1): Characteristics of study sample

Variables	Value
Gender	
• Male	182 (63.6%)
• Female	104 (36.4%)
Age (Mean±SD)	22.1±1.6
Scholastic year	
• 2 nd	69 (24.1%)
• 3 rd	52 (18.2%)
• 4 th	61 (21.3%)
• 5 th	53 (18.5%)
• 6 th	51 (17.8%)
Grade point average (No., Mean±SD)	286, 3.7±0.8

Figure (1). Medical students' quality of sleep

was 22.1±1.6 years. About one fourth of students (24.1%) were at their 2nd scholastic year, 18.2% were at their 3rd scholastic year, 21.3% were at their 4th scholastic year, 18.5% were at their 5th scholastic year, while 17.8% were at their 6th scholastic year. Students' mean Grade point average (GPA) was 3.7±0.8.

Table (2) shows that 76.2% of students use both Twitter and WhatsApp, 21.5% use WhatsApp only, 1% use Twitter only, while 1% do not use any. Most medical students (89.8%) use Twitter/WhatsApp every day. Most medical students use Twitter/WhatsApp for 3-4 or more than 5 hours daily (31.1% for both). Most medical students (88.7%) use Twitter/

Table (2): Patterns of students' use of Twitter and/or WhatsApp

Patterns of use	No. (%)
Using Twitter and/or WhatsApp:	
• Both	218 (76.2%)
• WhatsApp only	62 (21.7%)
• Twitter only	3 (1.0%)
• None	3 (1.0%)
Frequency of use (n=283)	
• Every day	254 (89.8%)
• Not every day	29 (10.2%)
Duration of use per day (n=283)	
• <1 hour	39 (13.8%)
• 1-2 hours	68 (24.0%)
• 3-4 hours	88 (31.1%)
• > 4 hours	88 (31.1%)
Period of maximal use (n=283)	
• Morning	10 (3.5%)
• Afternoon	22 (7.8%)
• Evening	80 (28.3%)
• Night	251 (88.7%)

WhatsApp during night.

Figure (1) shows that 29.7% of medical students have poor quality of sleep.

Table (3) shows that Twitter/WhatsApp use was significantly more among female than male medical students (81.7% and 73.1%, respectively, $p=0.006$). Use of Twitter/WhatsApp by medical students differed significantly according to their scholastic year ($p=0.005$), with highest use among 6th year medical students (94.1%). However, use of Twitter/WhatsApp did not differ significantly according to students age or grade point average (GPA).

Table (4) shows that medical students' quality of sleep differed significantly according to their scholastic year ($p=0.02$), with highest prevalence of poor quality among those at their 2nd and 6th scholastic years (37.7% and 37.3%, respectively). Quality of sleep differed significantly according to students' daily use of Twitter/WhatsApp ($p=0.022$), with highest prevalence of poor sleep quality among those who spend more than 4 hours daily using Twitter/WhatsApp. However, medical students' quality of sleep did not differ significantly according to their gender, age, GPA, use of Twitter/WhatsApp, frequency of daily use, or period of maximal use.

Table (3): Medical students' use of Twitter/WhatsApp according to their characteristics

Variables	Both	WhatsApp	Twitter	None	Test statistic	P value
Gender						
• Male	133 (73.1%)	46 (25.3%)	0 (0.0%)	3 (1.6%)	12.6*	0.006
• Female	85 (81.7%)	16 (15.4%)	3 (2.9%)	0 (0.0%)		
Age (Mean±SD)	22.2±1.6	21.7±1.5	22.3±1.5	22.0±1.0	F=1.87	0.134
Scholastic year						
• 2 nd	50 (72.5%)	19 (27.5%)	0 (0.0%)	0 (0.0%)	28.1*	0.005
• 3 rd	32 (61.5%)	17 (32.7%)	2 (3.8%)	1 (1.9%)		
• 4 th	48 (78.7%)	11 (18.0%)	0 (0.0%)	2 (3.3%)		
• 5 th	40 (75.5%)	12 (22.6%)	1 (1.9%)	0 (0.0%)		
• 6 th	48 (94.1%)	3 (5.9%)	0 (0.0%)	0 (0.0%)		
GPA (Mean±SD)	3.7±0.8	3.7±0.7	4.1±1.0	3.9±1.0	F=0.29	0.831

*The Likelihood ratio has been calculated instead of χ^2 since more than 25% of expected count were less than 5.

Table (4): Medical students' quality of sleep according to their characteristics

Variables	Good quality	Poor quality	Test statistic	P-value
Gender				
• Male	133 (73.1%)	49 (26.9%)	$\chi^2=1.88$	0.171
• Female	68 (65.4%)	36 (34.6%)		
Age (Mean±SD)	22.2±1.6	21.9±1.7	t=1.08	0.281
Scholastic year				
• 2 nd	43 (62.3%)	26 (37.7%)	$\chi^2=11.6$	0.020
• 3 rd	33 (63.5%)	19 (36.5%)		
• 4 th	50 (82.0%)	11 (18.0%)		
• 5 th	43 (81.1%)	10 (18.9%)		
• 6 th	32 (62.7%)	19 (37.3%)		
GPA (Mean±SD)	3.7±0.8	3.9±0.7	t=1.6	0.109
Using Twitter / WhatsApp:				
• Using both	150 (68.8%)	68 (31.2%)	4.6*	0.202
• Using WhatsApp only	45 (72.6%)	17 (27.4%)		
• Using Twitter only	3 (100.0)	0 (0.0%)		
• None	3 (100.0)	0 (0.0%)		
Frequency of use (n=283)				
• Every day	174 (68.5%)	80 (31.5%)	$\chi^2=2.5$	0.113
• Not every day	24 (82.8%)	5 (17.2%)		
Duration of use per day (n=283)				
• <1 hour	28 (71.8%)	11 (28.2%)	$\chi^2=9.6$	0.022
• 1-2 hours	54 (79.4%)	14 (20.6%)		
• 3-4 hours	116 (65.9%)	60 (34.1%)		
• > 4 hours	51 (58.0%)	37 (42.0%)		
Period of maximal use (n=283)				
• Morning	7 (70.0%)	3 (30.0%)	$\chi^2=0.46$	0.796
• Afternoon	14 (63.6%)	8 (36.4%)		
• Night	177 (70.5%)	74 (29.5%)		

* The Likelihood ratio has been calculated instead of χ^2 since more than 25% of expected count were less than 5.

DISCUSSION

Results of this study showed that almost all medical students in KKU use Twitter and/or WhatsApp. Only 3 medical students (1%) claimed that they were not users of any of these two social communication media and the majority were daily users for more than 2 hours, mostly at

night. Use of social media was significantly higher among females and final year medical students.

These findings are in accordance with those of A'lam Elhuda and Dimetry (2014), in Khartoum, Sudan, who reported that prevalence of social networks users among medical students was 93.1%, with higher prevalence among males than females (97.6% and 91.1%,

respectively). They attributed their finding by that males have more access to social networks and more freedom than females to do what they want without intervention from their family. They added that the WhatsApp is the most frequently used social network several times a week by medical students. They stated that the high prevalence of WhatsApp usage, which is high and increasing over years, because it is free, very easy, can be used on mobiles, tablets, even laptops and desktops, and programmed for many operating systems.

Moreover, Choudhary et al. (2015), reported that among Government Medical College students in Surat, India, 98% used social media and WhatsApp users were 94.6%. Participants spent around 2.3 hours on WhatsApp each day and 83.67% used to access the social media at night before sleeping.

The higher use of WhatsApp and Twitter by females in the present study may be explained by the fact that females need the social networks more than males because they may consider access to these networks an easy way to communicate in a conservative community. On the other hand, males can freely go out on their own any time day and night. Moreover, final year medical students can make use of social networking as an easy way to exchange information with their colleagues.

Choudhary et al. (2015) stated that communicating with each other has become much easier and faster with the advent of social networking and distance is no longer a barrier nowadays. Social networking has its beneficial effects on academic aspects. Medical students use that the WhatsApp as a good platform to share academic and health related articles, recent updates, sharing and discussing ideas.

Findings of this study showed that poor quality of sleep affected 29.7% of medical students. Poor quality of sleep was highest among those at their 2nd and 6th scholastic years and among those who spend more than 4 hours daily using Twitter/WhatsApp.

In King Saud College of Medicine, Riyadh, Saudi Arabia Abdulghani et al. (2012) reported that 36.6% of medical students had poor sleep quality. Moreover, in King Khalid College of Medicine, Abha, Saudi Arabia, Siddiqui et al. (2016) reported that poor sleep quality

was claimed by 74.2% of medical students.

The significantly higher prevalence of poor sleep quality among 2nd and final year medical students in our study probably reflects that poor sleep quality may be due to the relatively higher stress that medical students usually suffer during their first and last years of their undergraduate medical studies.

Regarding the possible association between social media and poor sleep quality, Espinoza (2011) found that 37% lost sleep due to using social networking applications. Woods and Scott¹⁶ stated that, using social media involves continued alerts at all times of the day. This feature affects sleep quality since incoming alerts usually disturb sleep at night. Van den Bulck (2003) added that sleep interruptions have been reported as a result of incoming text messages.

The association between social media use and sleep disturbances can be explained by several hypotheses. Frank et al. (2016) stated that social media use is a form of unstructured activity which usually lacks a clear beginning and end. Therefore, it is likely to be extended, thus, sacrificing sleep time, and shortening its duration. Moreover, use of social media is a sedentary form of entertainment, which may alter sleep architecture (Higuchi et al., 2005) and would lead to poor quality of sleep (Chen et al., 2005).

In conclusion, the majority of medical students in King Khalid College of Medicine, especially females and final year students, use social media, e.g., Twitter and/or WhatsApp. Almost one third of students have poor sleep quality, especially 2nd and final year medical students and those who use social media for more than two hours daily. Findings of the present study indicate a strong need for integrating sleep hygiene education for medical students to improve their sleeping practices and also to provide health education to promote correct and effective use of social networks to minimize their possible side effects among undergraduate medical students.

Results of the present study have important clinical implications for the health of young adults and public health practice. However, this study has some limitations. Participants' responses were mostly subjective and medical students' purpose of using social media was not

assessed. Future research should follow prospective longitudinal design so that the direction of association

between social media use and sleep disturbance can be determined.

References

- WERSM. WhatsApp vs. Facebook vs. Twitter. <http://wersm.com/whatsapp-vs-facebook-vs-twitter/>. Accessed on September 2nd, 2017.
- Afandi,O., Hawi, H., Mohamed, L., et al. (2013). Sleep Quality Among University Students: Evaluating the Impact of Smoking, Social Media Use, and Energy Drink Consumption on Sleep Quality and Anxiety. *Student Pulse*,5(06).
- Kline, C. (2013). Encyclopedia of Behavioral Medicine. Marc D. Gellman and J. Rick Turner (Editors). Springer, New York, pp. 1811-1813.
- Ahrberg,K., Dresler,M., Niedermaier,S., Steiger,A. & Genzel,L. (2012).The interaction between sleep quality and academic performance. *Journal of Psychiatric Research*, 46(12),1618-1622.
- Ito, E. & Inoue, Y. (2015). The International Classification of Sleep Disorders, third edition. American Academy of Sleep Medicine. Includes bibliographies and index. *Nihon Rinsho*,73(6),916-23.
- Roth T. (2007). Insomnia: Definition, prevalence, etiology, and consequences. *Journal of Clinical Sleep Medicine*, 3(5 Suppl), S7-S10.
- Ohayon, M.M. (2002). Epidemiology of insomnia: What we know and what we still need to learn. *Sleep Medicine Reviews*, 6(2), 97-111.
- Buyse,D.J., Reynolds,C.F., Monk,T.H., Berman,S.R. & Kupfer,D.J. (1989).Pittsburgh Sleep Quality Index (PSQI): A New Instrument for psychiatric practice and research. *Psychiatry Res*, 28(2),193-213.
- Choudhary, S.R., Momin, M.I.H. & Kantharia, S.L. (2015). Facebook and WhatsApp: Beneficial or Harmful? *Journal of Evidence Based Medicine and Healthcare*, 2(17),2506-2511.
- A'lamElhuda, D. & Dimetry, D.A. (2014). The Impact of Facebook and Others Social Networks Usage on Academic Performance and Social Life among Medical Students at Khartoum University. *International Journal of Scientific & Technology Research*, 3(5), 41-46.
- Abdulghani, H.M., Alrowais, N.A., Bin-Saad, N.S.,et al. (20120). Sleep disorder among medical students: Relationship to their academic performance. *Medical Teacher*, 34, S37-S41.
- Siddiqui, A.F., Al-Musa, H., Al-Amri, H., et al. (2016). Sleep Patterns and Predictors of Poor Sleep Quality among Medical Students in King Khalid University, Saudi Arabia. *Malays J Med Sci.*, 23(6), 94-102.
- Espinoza, G. (2011). The pervasiveness, connectedness, and intrusiveness of social network site use among young adolescents. *Cyberpsychology, Behavior & Social Networking*, 14(12), 705-709.
- Woods, H.C. & Scott, H. (2016). #Sleepyteens: Social media use in adolescence is associated with poor sleep quality, anxiety, depression and low self-esteem. *Journal of Adolescence*, 51, 41-49.
- Van den Bulck, J. (2003). Text messaging as a cause of sleep interruption in adolescents, evidence from a cross-sectional study. *Journal of Sleep Research*, 12(3), 263.
- Frank, E., Akpan-Ekpo, E. &Ekong, I. (2016). Social Media Use and Sleep Disturbances among Medical Undergraduates in Southern Nigeria. *Saudi J. Med.*, 1(3), 63-70.
- Higuchi, S., Motohashi, Y., Liu, Y. & Maeda, A. (2005). Effects of playing a computer game using a bright display on presleep physiological variables, sleep latency, slow wave sleep and REM sleep. *J Sleep Res*, 14, 267-73.
- Chen, X., Sekine, M., Hamanishi, S., et al. (2005). Lifestyles and health-related quality of life in Japanese school children: a cross-sectional study. *Prev. Med.*, 40, 668-78.