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RESEARCH ARTICLE

Problematic Social Media Use and Academic Performance among University Students: An Evaluation from The Middle East

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Abstract:

Background:

The widespread use of social media applications generated a problematic behavior of excessive and inappropriate use that has been associated with mental health problems. Available data assessed this behavior using different surrogate markers in certain university majors. This study aims to assess the effect of this behavior on academic performance, using a validated tool, across different majors.

Methods:

A cross-sectional study that randomly recruited university students from three Middle Eastern countries. using an online survey. The study included 277 participants with an average age of 21.53±2.1 years. The problematic social media use (PSMU) was evaluated using the Bergen Social Media Addiction Scale (BSMAS) and academic performance was evaluated using the GPA. Data regarding the demographics and the characteristic of social media use were collected.

Results:

PMSU was identified as an independent predictor of academic performance. The low academic performance group was more likely to use social media applications during the night, which negatively affected the ability to wake up the next day and be ready for exams.

Conclusion:

There is a need for a more large-scale systematic evaluation of the extent of PSMU and its effect on academic performance among university students at both the regional and international levels. These analyses will help in building effective interventions to reduce the impact of PSMU on university students.

Keywords: Social media, Academic performance, University students, Applications, Mental health problems, Humans.

Article History

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1. INTRODUCTION

Social media applications offer a real-time interactive platform that revolutionizes communication and interaction between humans in a readily available and easy manner [1]. Since their introduction, they have gained wide and increasing use throughout the world [1 - 5]. According to the statistics released by Instagram, one of the leading social media applications, more than 1 billion individuals actively use their application monthly [6]. Additionally, more than 500 million

individuals are actively using the application daily [6]. The widespread use and availability created an alternative and virtual environment through which individuals can express, share, and interact [2 - 4, 7]. These appealing settings generated a problematic behavior characterized by inappropriate and excessive use of social media applications [2 - 4, 7]. Furthermore, the inappropriate use of the internet, which includes social media applications, is being recognized as a possible psychiatric disorder. The problematic use of the internet reached alarming levels in certain parts of the world such as the United States and Korea [8 - 10]. It has been reported that 1 out of 8 Americans exhibited a problematic

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internet use pattern [9].

Data regarding the age distribution of social media application users clearly demonstrated that adolescents and young adults constitute the majority of users. Furthermore, it has been noted that the problematic use of social media applications is associated with a variety of health and well-being problems such as depression [11, 12], poor sleep quality [4, 11, 13 - 15] and decision making ability [2]. Additionally, abstinence from social media use has been found to reduce the levels of stress among heavy users [5]. A significant issue in this age group is the possible interference of social media applications with academic performance. Walsh *et al.* assessed the effect of social media use on academic performance among female college students [16]. Their findings showed an adverse effect of social media use on academic performance [16]. Similarly, it has been shown that the academic performance of female medical students is more likely to be negatively affected by social media use [17]. The effect on male students was less pronounced [17]. Interestingly, another study suggested a lack of association between WhatsApp use and academic performance among medical students [18]. A noteworthy point regarding these studies is the lack of a validated tool to measure excessive and problematic use. These studies instead considered the time spent using social media as a marker of excessive use [13, 16 - 20]. Although important, the time spent using social media does not offer a systematic method to assess the extent and severity of the problem. Furthermore, the available studies had a preferential focus on medical students. Accordingly, this study aims at quantifying the problematic use of social media applications in a systematic manner and assessing the effect of this behavior on academic performance among university students.

2. METHODS

2.1. Design

A cross-sectional study was designed to assess the association between social media addiction and academic performance among university students.

2.2. Participants

Participants were recruited through an open online invitation from April-June 2020 that was circulated through university email distribution lists as well as posted by students' social media groups in universities from Jordan, UAE, and KSA. The study was approved by the institutional review board at the Jordan University of Science and Technology, Irbid-Jordan (199/132/2020). Informed consent has been obtained from the study participants and Helsinki Declaration has been followed for the study. All participants were offered a description of the study in the invitation and prior to completing the survey to get their informed consent.

2.3. Variables and Instruments

Problematic social media use (PSMU) was evaluated through the Bergen social media addiction scale (BSMAS) in both Arabic and English languages. The scale is a validated tool that was developed by Andreassen *et al.* at the University

of Bergen to assess social media addiction and problematic use of social media applications [21, 22]. The tool was originally developed to assess Facebook addiction [22] and later modified to assess addiction to different social media applications by replacing the word Facebook with social media applications [21]. This modification did not alter the properties of the tool and it has a good internal consistency as reported by the authors [23]. The tool was translated into different languages and its validity and reliability were tested [2]. The validated Arabic version of the Bergen Facebook Addiction Scale (BFAS) was used in this study and a similar approach was used to adapt it to different social media applications. The word Facebook was replaced with social media applications. The tool is composed of six items measuring different aspects of addiction behavior. Each item is measured on a 5-point Likert scale ranging from rarely to very often. The items are scored from 1-5, respectively and the scale is calculated by summing the scores of all items. The score of the scale ranges from 6-30, with higher scores indicating higher levels of PSMU. Permission to use the tool in both languages has been obtained.

Academic performance was evaluated using the GPA as a primary outcome to measure academic performance. The GPA of the participants was categorized into three categories. The categories are low academic performance level ($GPA \leq 2.5$), intermediate academic performance (GPA between 2.5 and 3.5), and high academic performance (GPA higher than 3.5). The survey included other questions that assessed the characteristics of social media use and the extent of its effect on different aspects of the learning process, such as the ability to attend early classes and to maintain attention during the classes. Data regarding the demographics of the participants, the number of social media used, and time spent using daily social media over the last month were collected.

2.4. Statistical Analysis

Descriptive data were calculated for the sociodemographic variables. The distribution of academic performance levels - stratified based on these variables- was calculated using χ^2 for categorical data. For variables measured with continuous data, the student t-test or one-way analysis of variance (ANOVA) followed by Tukey as a post hoc analysis were applied as appropriate. Odds ratio and the corresponding 95% confidence intervals were calculated for the academic performance level using a stepwise regression analysis model. All statistical analyses were performed using the Statistical Package for Social Sciences (SPSS) version 24 (IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp.). A p-value of less than 0.05 was considered statistically significant.

3. RESULTS

3.1. Participants' Demographics

In this study, 277 participants were recruited with an average age of 21.53 ± 2.1 years. More than half of the participants were females (153 participants) and about a quarter (76 participants) of the participants were health sciences students, with a comparable percentage of engineering and IT students (72 participants).

Table 1. Baseline Characteristics of the participants.

	Total	Low Academic Performance	Intermediate Academic Performance	High Academic Performance	Test statistic ²	p-value ¹
Age (y), mean± SD	21.53±2.1	21.4±1.7	21.5±1.9	21.5±2.6	0.1 _(276,2)	0.9
Gender, n(%)					2.9	0.2
Male	124 (44.8)	30 (24.2)	66 (53.2)	28 (22.6)		
Female	153 (55.2)	26 (17)	82 (53.6)	45 (29.4)		
University Major, n(%)					8.9	0.35
Medical sciences	76 (27.4)	15 (19.7)	38 (50)	23 (30.3)		
Engineering and IT	72 (26)	19 (26.4)	34 (47.2)	19 (26.4)		
Business	13 (4.7)	4 (30.8)	4 (30.8)	5 (38.5)		
Law	7 (2.5)	1 (14.3)	4 (57.1)	2 (28.6)		
Other	109 (39.4)	17 (15.6)	68 (62.4)	24 (22)		
Social Media Apps, n(%)						
YouTube	141 (50.9)	23 (16.3)	70 (49.6)	48 (34.1)	9.4	0.009
Instagram	161 (58.1)	31 (19.3)	80 (49.7)	50 (31)	4.4	0.1
Twitter	60 (21.7)	14 (23.3)	28 (46.7)	18 (30)	1.4	0.49
Facebook	161 (58.1)	27 (16.8)	93 (57.8)	41 (25.4)	3.7	0.16
Messaging	187 (67.1)	39(20.9)	95 (50.8)	53 (28.3)	1.7	0.42
Snapchat	97 (35.0)	17 (17.5)	60 (61.9)	20 (20.6)	4.4	0.11
TikTok	23 (8.3)	4 (17.4)	15 (65.2)	4 (17.4)	1.5	0.47
BSMAS Score, mean± SD ²	16.89±5.95	18.00 ^a	17.2 ^a	15.4 ^b	3.5 _(276,2)	0.03

1: The test statistic and p values refer to the differences between the three categories of academic performance as measured by GPA in terms of the corresponding parameter.

2: Pairs denoted with different letters are statistically significant.

Among the participants, fifty-six (20.2%) showed low academic performance level, whereas 148 participants (53.4%) showed an intermediate academic performance level. The academic performance levels were comparable across both genders and university major. Table 1 provides a detailed description of the participants’ demographics.

3.2. PMSU and Academic Performance

The average PMSU score for the study sample was 16.89±5.95 (Table 1). Interestingly, the score of PMSU significantly varied across the different academic performance levels (F_(276,2) =3.5; p=0.03). Participants who demonstrated high academic performance had significantly lower PMSU scores compared to participants who showed low academic performance (15.4 Vs. 18; p<0.05).

The most used social media applications among the study sample were messaging applications (67.1%), followed by Facebook (58.1%) and Instagram (58.1%). TikTok was the

least used application with only 23 (8.3%) of the participants reporting its use. The frequency of different social media application use did not differ across the different levels of academic performance except for YouTube where its use was variable across the three academic performance level ($\chi^2=9.4$; p=0.009). Table 1 provides complete details on the use of different social media applications in the study sample.

3.3. Predictors of Academic Performance Levels

To account for the effect of different baseline characteristics on academic performance, a multivariate regression model was developed. Following the adjustment of the different demographic characteristics, the PMSU score was identified as the only independent predictor of high academic performance level. Participants with a high PMSU score were less likely to demonstrate a high level of academic performance (OR=0.92; 95% CI: 0.86-0.98). Table 2 provides the details of the multivariate logistic regression model.

Table 2. Logistic regression.

	Intermediate Academic Performance			High Academic Performance		
	OR	95% CI	p-value	OR	95% CI	p-value
Age	1.05	0.89-1.24	0.531	1.10	0.92-1.33	0.31
Gender	0.89	0.43-1.84	0.75	.482	0.19-1.00	0.05
University Major						
Medical sciences	0.60	0.24-1.5	0.23	1.06	0.38-2.99	0.91
Engineering and IT	0.35	0.15-0.82	0.02	0.63	0.24-1.69	0.36
Business	0.24	0.05-1.10	0.07	1.08	0.23-5.21	0.92
Law	0.92	0.09-9.65	0.94	2.17	0.16-29.69	0.56

(Table 2) contd....

	Intermediate Academic Performance			High Academic Performance		
	OR	95% CI	p-value	OR	95% CI	p-value
Other	-	-	-	-	-	-
Social media Apps						
YouTube	1.3	0.70-2.60	0.35	1.56	0.68-3.61	0.3
Instagram	1.0	0.48-2.07	0.99	1.35	0.57-3.1	0.51
Twitter	0.59	0.25-1.38	0.22	1.02	0.34-2.63	0.97
Facebook	1.9	0.96-3.88	0.07	1.33	0.60-2.93	0.49
Messaging	0.66	0.31-1.38	0.27	0.97	0.41-2.28	0.94
Snapchat	1.94	0.901-4.182	0.09	0.68	0.28-1.67	0.40
TikTok	1.5	0.41-5.47	0.55	0.68	0.14-3.35	0.63
Other	-	-	-	-	-	-
BSMAS Score	0.97	0.92-1.03	0.27	0.92	0.86-0.98	.009

3.4. Characteristics of Social Media Applications Use

Participants with high levels of academic performance were using a higher number of social media applications when compared to individuals with low academic performance level. Among individuals using four social media applications during the study period, 16 subjects (34.8%) showed high levels of academic performance compared to 7 subjects (15.2%) from the low academic performance level group ($\chi^2=17.9$; $p=0.06$).

Interestingly, participants in the low academic performance level reported more frequent use of social media applications

during classes compared to participants in the high academic performance level, but this difference did not reach a statistical difference (14.3% Vs. 9.6%; $\chi^2=8.3$; $p=0.35$). Furthermore, participants in the low academic performance level reported consistently higher levels of social media use interfering with the ability to prepare for exams (14.3% Vs. 4.1; $\chi^2=18.3$; $p=0.02$), as well as nighttime use of social media in a way that will interfere with the ability to wake up early and attend classes (16.1% Vs. 2.7%; $\chi^2=16.4$; $p=0.04$). Table 3 provides details of the characteristics of social media use among the study sample.

Table 3. Characteristics of social media use stratified according to academic performance level.

Number of social media applications used daily, n(%)	Low Academic Performance	Intermediate Academic Performance	High Academic Performance	χ^2	p-value
None	3 (5.4)	2 (1.4)	1 (1.4)	12.2	0.14
1	9 (16.1)	16 (10.8)	11 (15.1)		
2	26 (46.6)	54 (36.5)	22 (30.1)		
3	11 (19.6)	53 (35.8)	21 (28.8)		
4	7 (12.5)	23 (15.5)	16 (21.9)		
The amount of time spent on social media applications					
Less than an hour.	1 (1.8)	4 (2.7)	1 (1.4)	7.2	0.51
1-2	5 (8.9)	13 (8.8)	11 (15.1)		
2-3	7 (12.5)	30 (20.3)	15 (20.5)		
3-4	8 (14.3)	28 (18.9)	15 (20.5)		
More than 4	35 (62.5)	73 (49.3)	31 (42.5)		
The frequency of using social media applications during classes					
Never	10 (17.9)	19 (12.8)	12 (16.4)	8.5	0.39
Rarely	17 (30.4)	35 (23.6)	24 (32.9)		
Sometimes	13 (23.3)	57 (38.5)	25 (34.2)		
Most of the time	8 (14.3)	22 (14.9)	8 (11)		
Always	8 (14.3)	15 (10.1)	4 (5.5)		
The interference of social media applications use with the ability to meet deadlines					
Never	19 (33.9)	42 (28.4)	24 (32.9)	7.4	0.49
Rarely	11 (19.6)	38 (25.7)	22 (30.1)		
Sometimes	15 (26.8)	37 (25)	18 (24.7)		
Most of the time	8 (14.3)	15 (10.1)	7 (9.6)		
Always	3 (5.4)	16 (10.8)	2 (2.7)		
The interference of social media applications use with the ability to prepare for exams					
Never	9 (16.1)	25 (16.9)	22 (30.1)	18.3	0.02
Rarely	6 (10.7)	24 (16.2)	15 (20.5)		

(Table 3) contd....

Number of social media applications used daily, n(%)	Low Academic Performance	Intermediate Academic Performance	High Academic Performance	χ ²	p-value
Sometimes	16 (28.6)	57 (38.5)	24 (32.9)		
Most of the time	17 (30.4)	24 (16.2)	9 (12.3)		
Always	8 (14.3)	18 (12.2)	3 (4.1)		
The effect of nighttime social media use on the ability to wake up and attend the first lecture next day					
Never	11 (19.6)	34 (23)	22 (30.1)	16.4	0.04
Rarely	14 (25)	28 (18.9)	21 (28.8)		
Sometimes	16 (28.6)	35 (23.6)	12 (16.4)		
Most of the time	6 (10.7)	26 (17.6)	16 (21.9)		
Always	9 (16.1)	25 (16.9)	2 (2.7)		
Perceived negative effect of social media use on academic performance					
Extremely rare	6 (10.7)	10 (6.8)	9 (12.3)	23.9	0.002
Rare	4 (7.1)	29 (19.6)	22 (30.1)		
Sometimes	18 (32.1)	45 (30.4)	25 (34.2)		
Little bit large	15 (26.8)	48 (32.4)	14 (19.2)		
Very large	13 (23.2)	16 (10.8)	3 (4.1)		

Table 4. Association between social media use characteristics and academic performance.

Characteristics	r	p-value
Number of social media applications used daily	0.137	0.023
The amount of time spent on social media applications	-0.127	0.034
The frequency of using social media applications during classes	-0.061	0.315
The interference of social media applications use with the ability to meet deadlines	-0.054	0.374
The interference of social media applications use with the ability to prepare for exams	-0.22	0.0002
The effect of nighttime social media use on the ability to wake up and attend the first-class next day	-0.111	0.066
Perceived negative effect of social media use on academic performance	-0.229	0.0001

3.5. The Association between the Characteristics of Social Media Use and Academic Performance

The number of social media applications used on a daily basis during the study period was found to have a direct relationship with the level of academic performance (r=0.137; p=0.023). On the other hand, the time spent using social media applications showed an inverse relationship with academic performance (r=-0.127; p=0.034). Similarly, the effect of using social media applications for exam preparation and the perceived negative effect of using social media on academic performance had an inverse relationship with the academic performance level. Table 4 provides details of the associations between characteristics of social media use and academic performance.

4. DISCUSSION

The main objective of the current study is to assess the effect of problematic use of social media on academic performance. Furthermore, the characteristics of social media use were evaluated and their effect on scholastic performance was quantified. Our findings identified PMSU measured using BSMAS as a single independent predictor of academic performance among university students. Participants in the low academic performance group scored higher in the BSMAS. Interestingly, students with lower academic performance showed higher levels of awareness of the negative effect of

social media applications on their academic performance.

Social media addiction is being increasingly recognized as a problem with several detrimental consequences on the mental health and functioning of young adults [2, 3, 13, 20, 22, 24, 25]. It has been found that social media addiction is associated with depression and anxiety [4, 5, 20, 24]. Furthermore, social media addiction has a detrimental effect on self-esteem as well as decision making abilities of students. Multiple lines of evidence suggested a detrimental effect of social media addiction on academic performance. Azizi *et al.* reported a negative relationship between social media addiction and academic performance among medical students [26]. Similarly, Hou *et al.* demonstrated a similar effect of social media application addiction on academic performance among a sample of Chinese college students [9]. Current results identified the extent of PSMU measured using the BSMAS as an independent predictor of academic performance among high academic performance students compared to low academic performance students. Higher values of the BSMAS predicted lower chances of being among students in the high academic performance group. Furthermore, participants in the low academic performance group scored higher on the BSMAS compared to the high academic performance group.

In this study, the average BSMAS score of the participants was 16.89±5.95. The average BSMAS score of the total study sample is higher than that reported by Hou in a similar study

sample. Similarly, the BSMAS of the sample of the current study were considerably higher than those reported by Andreassen *et al.*, who showed a BSMAS score of 12 among participants aged 16-25 in a large population-based study in Norway [21, 22]. Furthermore, participants in the lower academic performance group, who constituted about 20% of the study sample, had an average BSMAS of 18. This score has been suggested as a cutoff point to classify subjects as social media addicts [21, 22, 24]. The percentage of people who can be classified as high PMSU is greater than the percentage reported by similar studies [8, 21, 24]. Hou *et al.* reported that about 14.7% of the study sample were classified as social media addicts [24]. Similarly, another study reported that about 12% of their study sample were addicts [21, 26]. These findings suggest a higher level of social media application addiction in the sample of the current study.

Current study's results demonstrated a more frequent nighttime use of social media applications among the low academic performance group compared to the high academic performance group. Furthermore, participants in the low academic performance group were more likely to report nighttime use of social media applications in a way that it interferes with their ability to wake up the next day and attend the first class or exam. These results are consistent with data from Jha *et al.* [25] and Upadhyay *et al.* [27].

CONCLUSION

Current results demonstrated a high level of PSMU among university students that was associated with lower academic performance level.

LIMITATIONS

The current study has a number of limitations. The study recruited a small number of participants from three countries which might reduce the generalizability of the study. Additionally, the use of self-reported questionnaires and data on academic performance may introduce bias.

IMPLICATIONS FOR PSYCHIATRIC NURSING PRACTICE

In this study, a systematic analysis of PSMU has been performed and its association with academic performance has been investigated. The findings of this study suggest an association between the excessive use of social media applications and poor academic performance. Furthermore, the nighttime use of social media was associated with detrimental behaviors on academic performance. Interestingly, these findings were similar across different disciplines. They suggest a general pattern among university students in three different countries. Accordingly, it is imperative to conduct a more in-depth analysis of the predictors of PSMU, which will help in designing campus wide as well as international collaborative efforts to help ameliorate the detrimental effects of social media addiction on academic performance. This highly sought effort requires the expertise of multidisciplinary teams that can handle the different aspects of this phenomenon. Essential to these teams is the role of nursing practitioners who are logically placed in direct contact with university students.

LIST OF ABBREVIATIONS

PSMU	=	Problematic Social Media use
BSMAS	=	Bergen Social Media Addiction Scale

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was approved by the institutional review board at the Jordan University of Science and Technology, Irbid-Jordan (199/132/2020).

HUMAN AND ANIMAL RIGHTS

No animals were used for studies that are the basis of this research. All the humans used were in accordance with the Helsinki Declaration of 1975.

CONSENT FOR PUBLICATION

Informed consent was obtained from the patients.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data will be available upon request *via* e-mail to the corresponding author [A.A.].

FUNDING

None.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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