



## Research article

# Prevalence of bullying and its impact on self-esteem, anxiety and depression among medical and health sciences university students in RAS Al Khaimah, UAE

Fatma M. Ibrahim <sup>a,b,c,\*</sup>, Eman Abdelaziz Rashad Dabou <sup>a,c</sup>, Shaimaa AbdelSamad <sup>d</sup>,  
Israa A.M. Abuijlan <sup>d</sup>

<sup>a</sup> RAK College of Nursing, RAK Medical and Health Sciences University, Ras Al Khaimah, United Arab Emirates

<sup>b</sup> Faculty of Nursing Mansoura University, Egypt

<sup>c</sup> Medical-Surgical Nursing department, Faculty of Nursing, Alexandria University, Egypt

<sup>d</sup> College of Nursing, RAK Medical and health Sciences University, Ras Alkhaimah, United Arab Emirates

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## ABSTRACT

Bullying and peer victimization among medical and health sciences students is a public health issue. This is owing to its detrimental impact and greater risk of psychiatric diseases and psychopathology in childhood, adolescence, and adulthood. As a result, a descriptive cross-sectional research study was conducted to investigate the prevalence of bullying and its influence on self-esteem, anxiety, and depression among medical and health sciences university students in RAS Al-Khaimah, United Arab Emirates. Approximately 369 students from MBBS, BDS, B Pharm, and BSN colleges were selected. The instruments included sociodemographic questions, bullying queries, the Rosenberg Self-Esteem Scale, and the Primary Care Anxiety and Depression Scale. Participants averaged  $21.49 \pm 2.95$ . 34.1 % of medical students were bullied. 44.4 % of individuals were called insulting names, making verbal bullying the most common method. The linear regression analysis of bullying data shows that girls (53.2 %) are bullied more than boys (46.8 %). Bullied individuals had a mean score of  $43.30 \pm 19.74$ , indicating a higher rate of depression and anxiety. Bullied students had a mean score of  $44.62 \pm 9.94$ , indicating lower self-esteem. Significant differences were observed in relation to bullying when considering the variables of the university year, mother's education, and previous experience of bullying ( $P = 0.002, 0.038, 0.001$ ). It is imperative that universities establish comprehensive protocols to identify instances of such behaviour and provide necessary assistance to victims and their families.

## 1. Introduction

A specific kind of besieged harassment or interpersonal violence, known as bullying, is defined by an imbalance of power between the doer and the sufferer. This type of behavior can include several subcategories, such as mistreatment, vulgarity, and harassment, in addition to more specialized forms like mobbing, horizontal and lateral violence [1,2]. Researchers contend that these categories of bullying are distinct forms with distinct characteristics and outcomes, not merely synonyms [3].

\* Corresponding author. RAK College of Nursing, RAK Medical and Health Sciences University, Ras Al Khaimah, United Arab Emirates.  
E-mail addresses: [fatma@rakmhsu.ac.ae](mailto:fatma@rakmhsu.ac.ae), [Fatma\\_magdi@mans.edu.eg](mailto:Fatma_magdi@mans.edu.eg) (F.M. Ibrahim).

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Despite growing concerns regarding students' mental health, research on bullying in Higher Education (HE) has been mostly overlooked compared to bullying in schools [4]. Bullying behavior has received less attention than studies and solutions devoted to gender-based violence on college campuses [5]. Bullying among university students is known to occur [6], and bullying is recognized to be mentally harmful to people of all ages [7]. Students' comprehension of power dynamics within the HE organizational structure is lacking. It is uncertain whether bullying models from childhood or adulthood are more appropriate because the majority of university students are emerging adults (EAs) who exhibit characteristics of both adults and adolescents [8]. Within a university's institutional frameworks and social environments, emerging adult students find themselves in a different ecological system than a school or job [9]. Additionally, they are more likely to be in the 18 to 25 age range. They may experience bullying at a level comparable to that of school children but at a higher level than that of older adults [10].

Healthcare facilities are reporting a rise in bullying and harassment occurrences, even though these episodes can occur in several settings [11]. Additionally, compared to other departments of higher education, abuse occurs more frequently in medical faculties [12, 13]. Studies by Frank et al. (2006) and Uhari et al. (1994) show that bullying among medical students is frequent in the USA (42 %) and Scandinavian countries like Finland (75 %) [14,15]. According to Ahmer et al. (2008) and Al-Hussain et al. (2008), Middle Eastern countries like Jordan (61 %) and Pakistan (52 %) stated their respective rates [16,17].

According to a recent study, the hierarchical character of the nursing profession makes nursing students especially susceptible to bullying. New graduates in foreign environments or with little clinical experience are particularly vulnerable [18,19]. Students who experience bullying may experience emotional or psychological effects in the form of rage, distress, pressure, and suicidal thoughts. Furthermore, it can exacerbate social disorders in situations when victims may engage in malevolent behavior [20]. Furthermore, traumatized medical students suffer long after they graduate. Regretfully, it can exacerbate stress associated with the workplace, lead to high rates of sick leave, diminish output, degrade achievement, weaken teamwork, and result in a shortage of medical professionals [20,21].

## 2. Theoretical background

Bullying is a pervasive phenomenon that can continue throughout college. Universities have a reputation for bullying. A cross-sectional survey of Abu Dhabi University students found that 26 % were bullied [22]. Additionally, a study revealed that 50 % of medical students have been cyberbullied [23].

Even while bullying is common and has adverse effects everywhere, there is not much research that has been done in the Middle Eastern and Arab nations. These investigations revealed that bullying was expected, with rates ranging from 20.9 % in the United Arab Emirates to 44.2 % in Jordan [24]. In a survey of a nationally representative sample, it was found that 31 % of Egyptian adolescents engaged in physical fighting often [25]. Nevertheless, not much research has been done on the frequency and kinds of bullying that occur in college, especially among medical students who are known to be in high-stress situations that might result in bullying that has significant repercussions [26].

Bullying can cause depression, anxiety, low self-esteem, and suicidal thoughts [27]. There was a statistically significant connection between cyberbullying and suicide behavior in all their systematic reviews. On the one hand, actual data shows that many cyber victims have suicidal thoughts [28]. In a different study, a large percentage of cyberbullying victims reported suicidal ideation and self-harm, including attempted suicide [29]. Peer victimization, self-esteem, anxiety, and depression are linked, and some researchers believe that bullying victims' emotional experiences, such as shame, guilt, frustration, and fear, lower their self-esteem. This low self-esteem predicts social anxiety in these people [30,31]. Low self-esteem is also linked to depressive symptoms in several studies [32,33].

Global bullying prevention measures are receiving more attention [34]. Nevertheless, bullying still exists. The above findings suggest that bullying is a serious issue that needs further study. The main objective of medical school is to generate graduates who are capable, educated, and compassionate doctors who can advance and improve community health. Medical students' mental health, empathy for patients, morale, and retention in the field has all been demonstrated to be negatively impacted by bullying [35]. However, little to no data is known regarding the incidence of bullying among medical students in the Middle East, particularly in the Arab world. There is little evidence on the frequency of different forms of bullying experienced by medical and health science students and its implications for their self-esteem and mental health. Identifying the characteristics that explain the association between bullying, anxiety and depression symptoms is essential to developing effective intervention programs.

## 3. Study design

A descriptive cross-sectional research design aimed to determine the prevalence of bullying and its impact on self-esteem, anxiety, and depression among medical and health sciences university students in RAS Al Khaimah, United Arab Emirates.

### 3.1. Sample and data analysis

The sample for this study was drawn from undergraduate students from the four colleges of RAK Medical and Health Science University (MBBS, BDS, B Pharm, and BSN) at RAS Al-Khaimah Emirates in the United Arab Emirates. The sample size was calculated using the Rao Soft program (Raosoft Inc) [36] (Sample Size Calculator) based on the total number of students from the four colleges (N = 1200), with an accepted margin of error of 5 % and a confidence level of 95 %. The response distribution is 50 %, and the confidence level is 95 %. N = 369 constitutes the sample size. Using a stratified random sampling technique, the formula (sample size/population

size) x stratum size was applied to the following numbers: 153 MBBS students, 86 BDS students, 36 B Pharm students, and 94 BSN students.

Participants who consented to participate in the study were furnished with extensive details about the study's aims, duration, and potential benefits associated with their participation. Additionally, inclusion criteria were as follows: 1: RAKMHSU undergraduate students who accepted to participate in the study and could understand the consent and comprehend the questionnaire. The exclusion criteria were: 1: The students who were not interested in the study. The data were collected from January to April of 2023 after. The instruments required 15–20 min to implement.

### 3.2. Research questions

In accordance with the stated purpose, four research questions (RQ1, RQ2, RQ3 and, RQ4) have been constructed, relying on the state of research discussed in the second section.

Research question 1 What is the prevalence of bullying among university students in RAS Al Khaimah, United Arab Emirates?

Research question 2 What are the predominant types of bullying observed among university students in RAS Al Khaimah, United Arab Emirates?

Research question 3 What are the factors that contribute to the occurrence of bullying among university students in RAS Al Khaimah, United Arab Emirates?

Research question 4 Is there a difference in the levels of depression, anxiety, and self-esteem between students who have experienced bullying and those who have not?

### 3.3. Description of survey instruments

The tools consisted of four parts as follows.

#### 3.3.1. Socio-demographic characteristics questionnaire

Information related to Gender, age, nationality, marital status, college, year in university, parental education and employment status, monthly income, number of persons in the family, and family type were all collected.

#### 3.3.2. Bullying questions

The researchers developed questions after reading literature; researchers created bullying questions like, "Have you been bullied at the university?" Those who answered "Yes" were asked 10 questions about bullying frequency, aggressors, forms of bullying, emotional experience, response, and reasons. Answers to "No" to bullying were told to move on to question 7 ("In general, what are some of the reasons some students got bullied?"). Through 10 ("How should the university handle bullying and aggressive students?") [22]. this tool scored 0.90 Cronbach's alpha for reliability.

#### 3.3.3. Rosenberg Self-Esteem Scale

The self-reported RSES (Rosenberg, 1965) [37] measures global and current self-esteem with 10 items on a 4-point Likert scale. More substantial RSE scores indicate stronger self-esteem. The self-esteem scale is commonly used in studies. Recorded scale coefficients of reliability were 0.76 [38]. Scale construct validity was also verified.

#### 3.3.4. The primary care anxiety and depression scale

The PCAD (El-Rufaie et al., 1997) [39] consists of 12 items meant to assess anxiety and depression. High PCAD scores indicate anxiety and depression on a four-point Likert scale from 0 (not at all) to 3 (always). With a Cronbach's alpha of 0.91, researcher found that the scale can detect clinically significant feelings of anxiety and depression in Arab populations [39].

**Table 1**

Distribution of the study population (N = 369) based on the study course and year of the study at the University.

College	N	%
<b>Medical</b>	153	41.5
<b>Nursing</b>	94	25.3
<b>Dental</b>	86	23.2
<b>Pharmacy</b>	36	10.0
<b>Year of the University</b>	<b>N</b>	<b>%</b>
<b>1</b>	48	13.0
<b>2</b>	71	19.2
<b>3</b>	68	18.4
<b>4</b>	154	41.7
<b>5</b>	28	7.6

### 3.4. Statistical analysis

The data were described qualitatively using numbers and percent. The Kolmogorov-Smirnov test confirmed distribution normality. Range (min-max), mean, and standard deviation describe quantitative data. Results were considered significant at the 5 % level. Mann-Whitney, Kruskal-Wallis, and Pearson coefficients were utilized.

## 4. Results

### 4.1. Socio demographic characteristics of the participants

A cohort of students from various branches of the medical field was recruited for the study (Table 1). The study population comprised of 41.5 % of medical students followed by nursing students constituting to 25.3 %. The other half of the population was from dental (23.2 %) and pharmacy students (10 %). Most of the study's respondents (41.7 %) were in the fourth year of their University course.

The socio-demographic characteristics of the study were categorized between males and females (Table 2). The study comprised males (75.39 %), mostly aged between 20 and 24 years, compared to females, constituting 71.35 %. The participants were mostly from non-Arabic nations, constituting 70.68 % males and 68.54 % females. Characteristics like parents' jobs, education, and family income are detailed in Table 2.

### 4.2. Bullying types and frequencies

The study analysis revealed that a total of 34.1 % of the respondents had experienced bullying at the University (Table 3a). Of these, 61.9 % reported being bullied at least once in college. Amongst different types of bullying, verbal bullying was found to be the most commonly used in the colleges, with 44.4 % reporting being bullied with offensive and unpleasant names. Cyber or electronic bullying was found to be the highest form of bullying, with 23.8 % experiencing cyberbullying. Emotional bullying, not included as a part of the social interactions, was found among 19.8 % of the students. 19.0 % of the students reported having been victims of physical bullying, like receiving harsh jokes directed at their bodies.

Emotional bullying (Table 3b) was found to be the highest form of bullying experienced by female students (76.92 %). Physical bullying was the second highest among female students (64.18 %) as compared to male students (35.82 %). Verbal bullying was the third most common bullying among females (53.85 %). However, the forms of bullying were found to be different as reported by male students, with verbal bullying being the highest (46.15 %), followed by physical bullying (35.82 %), and emotional bullying being slightly less experienced (23.08 %). The difference in the types of bullying between male and female students was found to be

**Table 2**

Socio-demographic characteristics of the study population (N = 369) categorized between males and females.

Socio-demographic characteristics	Status	Male N (%) (n = 191)	Female N (%) (n = 178)
<b>Age</b>	15–19	34 (17.80 %)	40 (22.47 %)
	20–24	144 (75.39 %)	127 (71.35 %)
	25–30	13 (6.81 %)	11 (6.18 %)
<b>Marital Status</b>	Married	177 (92.67 %)	168 (94.38 %)
	Unmarried	14 (7.33 %)	10 (5.62 %)
<b>Family Type</b>	Nuclear	120 (62.83 %)	113 (63.48 %)
	Extended	71 (37.17 %)	65 (36.52 %)
<b>Nationality</b>	Arab	56 (29.32 %)	56 (31.46 %)
	Non Arab	135 (70.68 %)	122 (68.54 %)
<b>Maternal Education</b>	Elementary School	25 (13.09 %)	37 (20.79 %)
	High School	67 (35.08 %)	67 (37.64 %)
	Secondary School	35 (18.32 %)	35 (19.66 %)
	University	64 (33.51 %)	39 (21.91 %)
<b>Paternal Education</b>	Elementary School	29 (15.18 %)	31 (17.42 %)
	High School	61 (31.94 %)	67 (37.64 %)
	Secondary School	38 (19.90 %)	33 (18.54 %)
	University	63 (32.98 %)	47 (26.40 %)
<b>Maternal Job</b>	Housewife	137 (71.73 %)	144 (80.90 %)
	Officer	26 (13.61 %)	20 (11.24 %)
	Self-employed	28 (14.66 %)	14 (7.87 %)
<b>Paternal Job</b>	Officer	41 (21.47 %)	37 (20.79 %)
	Worker	50 (26.18 %)	41 (23.03 %)
	Self-employed	68 (35.60 %)	68 (38.20 %)
	Unemployed	32 (16.75 %)	32 (17.98 %)
<b>Monthly Income</b>	Good	61 (31.94 %)	49 (27.53 %)
	High	10 (5.24 %)	6 (3.37 %)
	Middle	94 (49.21 %)	90 (50.56 %)
	Minimum	26 (13.61 %)	33 (18.54 %)

**Table 3a**  
Distribution of the studied sample according to questions regarding bullying and its types (N = 369).

	N	%
Have you been bullied in the university?		
Yes	126	34.1
No	243	65.9
<b>How many times have you been bullied in the University?</b>		
(N = 126)		
1	78	61.9
2	18	14.3
3	6	4.8
More than 3	24	19.0
<b>By whom did you get bullied?</b>		
(N = 126)		
Students	69	54.8
group of students	33	26.2
a faculty/instructor	24	19.0
a university staff	0	0.0
<b>What kind of bullying were you exposed to?#</b>		
(N = 126)		
<b>a)Physical Bullying</b>		
Pushing from class mates	14	11.1
Kicking or slapping	13	10.3
Assault with a dangerous tool	2	1.6
Pulling hair or ear	14	11.1
Rough jokes to the body	24	19.0
<b>b)Verbal bullying</b>		
I was called by offensive and unpleasant names.	56	44.4
My classmate call me by inappropriate, and abusive names	8	6.3
My classmate mock at me	12	9.5
My classmate making fun of me	12	9.5
My classmate criticize (dissing) me	10	7.9
I was exposed to insults and swear words	8	6.3
My classmate is gossiping about me	11	8.7
<b>c)Emotional bullying</b>		
Some people don't want to include me in their social cycle	25	19.8
I was being humiliated	8	6.3
I exposed to discrimination	11	8.7
Damage to goods	8	6.3
<b>d)Sexual bullying</b>		
Sexually explicit expressions	0	0.0
Molesting	6	4.8
Harassment by hand	2	1.6
<b>e)Electronic bullying (Cyber bullying)</b>		
	30	23.8

#: More than one answer.

**Table 3b**  
Types of bullying observed between the male and female population.

Types of Bullying	Male	Female	P-value
Physical bullying	24 (35.82 %)	43 (64.18 %)	* ( $p=0.047$ )
Verbal bullying	54 (46.15 %)	63 (53.85 %)	* ( $p=0.021$ )
Emotional bullying	12 (23.08 %)	40 (76.92 %)	* ( $p=0.028$ )
Sexual bullying	7 (87.5 %)	1 (12.5 %)	NS
Cyber bullying	17 (56.67 %)	13 (43.33 %)	NS

NS- Non significant.

statistically significant. Sexual bullying and cyberbullying were found to be the highest among males as compared to females. However, the difference was not found to be statistically significant.

#### 4.3. Reactions and feelings towards bullying

Various questions were asked to understand the emotions felt by the students who underwent bullying (Table 4). Approximately 29.4 % of those who were bullied at university reported feeling depressed after being exposed to bullying 28.6 % of respondents did not show any response towards bullying, and 27.0 % of the students admitted to having been informing their family member or an advisor. Around 27.9 % and 22.2 % of students were bullied for physical appearance, hatred, and jealousy, respectively. 35.8 % of the students stated that new restrictions should be implemented to handle bullying and violence in the University campus. In addition, 37.4 % of the students had experienced prior primary school bullying.

**Table 4**  
Distribution of the studied sample according to questions regarding bullying and its types (N = 126).

	No.	%
How did you feel after been exposed to bullying?	(N = 126)	
Scared	11	8.7
Anxious	9	7.1
Depressed	37	29.4
Unable to concentrate on studying	17	13.5
Angry	33	26.2
Other feelings	19	15.1
<b>What is your response to bullying?</b>		
No reaction	36	28.6
Tell my friend	24	19.0
Inform Student Affairs	18	14.3
Revenge and self-defense	14	11.1
Inform a family member or my advisor	34	27.0
<b>In general, what are some of the reasons some students got bullied?</b>		
Jealousy	103	27.9
Physical appearance	82	22.2
Hate	82	22.2
Nationality	34	9.2
other	68	18.4
<b>How do you think the university should deal with bullying and aggressive student behavior?</b>		
Dismissal for the students acting aggression against others	84	22.8
Awareness programs	98	26.6
Warning	55	14.9
New rules to deal with bullying on campus	132	35.8
Dismissal for the students acting aggression against others	84	100.0
<b>Bullying experience at primary school, secondary and home#</b>		
Have you been exposed to any type of bullying in primary school	138	37.4
Have you been exposed to any type of bullying in secondary/high school	120	32.5
Have you been exposed to any type of bullying at home	93	25.2

**Table 5a**  
Univariate logistic regression analysis for the study population (N = 369).

	Study Population (N = 369)		Univariate	
	Not Bullying (n = 243)	Bullying (n = 126)	p	OR (LL – UL 95 %C.I)
<b>Gender</b>				
Female	111 (45.7 %)	67 (53.2 %)	0.172	1.350 (0.877–2.079)
Male ®	132 (54.3 %)	59 (46.8 %)		1.000
<b>Age</b>	21.60 ± 2.99	21.27 ± 2.88	0.313	0.963 (0.895–1.036)
<b>Year of the University</b>				
1	26 (10.7 %)	22 (17.5 %)	0.002*	0.746 (0.621–0.894)
2	44 (18.1 %)	27 (21.4 %)		
3	30 (12.3 %)	38 (30.2 %)		
4	127 (52.3 %)	27 (21.4 %)		
5	16 (6.6 %)	12 (9.5 %)		
<b>Maternal Education</b>				
Low education®	96 (39.5 %)	36 (28.6 %)		1.000
High education	147 (60.5 %)	90 (71.4 %)	0.038*	1.633 (1.026–2.597)
<b>Paternal Education</b>				
Low education®	92 (37.9 %)	39 (31.0 %)		1.000
High education	151 (62.1 %)	87 (69.0 %)	0.189	1.359 (0.860–2.149)
<b>Maternal Job</b>				
Not working®	188 (77.4 %)	93 (73.8 %)		1.000
Working	55 (22.6 %)	33 (26.2 %)	0.447	1.213 (0.737–1.996)
<b>Paternal Job</b>				
Not working®	39 (16.0 %)	25 (19.8 %)		1.000
Working	204 (84.0 %)	101 (80.2 %)	0.362	0.772 (0.443–1.347)
<b>Rosenberg Self-Esteem</b>	45.93 ± 19.24	44.62 ± 9.94	0.391	1.007 (0.991–1.022)
<b>The Primary Care Anxiety and Depression</b>	39.70 ± 14.86	43.30 ± 19.74	0.052	1.013 (1.000–1.026)
<b>Bullying experience at primary school, secondary and home#</b>				
Have you been exposed to any type of bullying in primary school	70 (28.8 %)	68 (54.0 %)	<0.001*	2.898 (1.853–4.531)
Have you been exposed to any type of bullying in secondary/high school	63 (25.9 %)	57 (45.2 %)	<0.001*	2.360 (1.500–3.713)
Have you been exposed to any type of bullying at home	42 (17.3 %)	51 (40.5 %)	<0.001*	3.254 (2.000–5.296)

#### 4.4. Univariate logistic regression analysis and factors affecting bullying

Univariate logistic regression analysis (Table 5a) showed that 53.2 % of females and 46.8 % of males were bullied. There was no statistically significant correlation between genders and bullying. A mean score of  $43.30 \pm 19.74$  indicates a higher prevalence of anxiety and depression among students who experienced bullying compared to those who did not. In addition, the bullied group had lower self-esteem, with a mean score of  $44.62 \pm 9.94$ . The students who experienced bullying reported more bullying in primary school, high school, or in their family (54.0 %, 45.2 %, and 40.5 %, respectively) than those who did not. Significant differences were observed between previous bullying and university bullying. A significant difference (Table 5b) was observed in the course year in the University, maternal education, and previous bullying experience ( $p = 0.002, 0.038, 0.001$ ).

#### 4.5. Correlation between the Rosenberg self-esteem measure and the primary care anxiety and depression scale

An inverse correlation (Table 6) was observed between the scores obtained from the Rosenberg self-esteem scale and the primary care anxiety and depression scale, indicating a negative relationship between self-esteem and the primary care anxiety and depression scale. The inverse correlation was found to be more dominant in the bullied students ( $r = 0.5867, p = <0.0001$ ) than in the non-bullied students ( $r = 0.2136, p = 0.0008$ ).

#### 4.6. Cronbach's alpha representing the internal consistency of the questionnaires

In order to assess the internal consistency of the questionnaires for the Rosenberg's self-esteem measure and the primary care anxiety and depression scale, Cronbach's alpha (Table 7) was calculated. The Cronbach's alpha for Rosenberg Self-Esteem Scale and The Primary Care Depression Scale Anxiety scale was found to be 0.62 and 0.81, respectively.

#### 4.7. Rosenberg self-esteem measure and the primary care anxiety and depression scale between the bullied and non-bullied students

The average self-esteem scores between the bullying and non-bullying students were calculated. In both males and females, higher self-esteem scores were observed in the non-bullying students compared to the bullied students (Table 8). Similarly, lower average depression scores were observed in the non-bullying students as compared to the bullied students. The correlation matrix plot presented in Fig. 1(A and B) showed a dispersed cluster indicating variations in the psychological status of the students undergoing bullying compared to a concentrated cluster amongst the non-bullying students.

## 5. Discussion

### 5.1. Prevalence of the bullying among studied population

Bullying is a severe psychosocial issue with negative implications. The bullying and victimization of medical and health sciences students can harm the educational process and cause psychological trauma and functional limitations. Regarding bullying, medical professionals and students constitute a unique group. Research indicates that the incidence of mistreatment among medical students

**Table 5b**  
The predictors of bullying.

	Univariate		<sup>a</sup> Multivariate	
	p	OR (LL – UL 95 %C.I)	p	OR (LL – UL 95 %C.I)
Female	0.172	1.350 (0.877–2.079)		
Age	0.313	0.963 (0.895–1.036)		
Year of the University	0.002*	0.746 (0.621–0.894)	0.016*	0.787 (0.647–0.957)
High Mothers' education	0.038*	1.633 (1.026–2.597)	0.022*	1.785 (1.085–2.936)
High Fathers' education	0.189	1.359 (0.860–2.149)		
Maternal job (Working)	0.447	1.213 (0.737–1.996)		
Paternal job (Working)	0.362	0.772 (0.443–1.347)		
Rosenberg Self-Esteem	0.391	1.007 (0.991–1.022)		
The Primary Care Anxiety and Depression	0.052	1.013 (1.000–1.026)		
Bullying experience at primary school, secondary and home#				
Have you been exposed to any type of bullying in primary school	<0.001*	2.898 (1.853–4.531)	0.061	1.749 (0.974–3.142)
Have you been exposed to any type of bullying in secondary/high school	<0.001*	2.360 (1.500–3.713)	0.478	1.236 (0.689–2.217)
Have you been exposed to any type of bullying at home	<0.001*	3.254 (2.000–5.296)	0.001*	2.563 (1.498–4.384)

OR: **Odd's ratio**.

C.I: Confidence interval LL: Lower limit UL: Upper Limit.

#: All variables with  $p < 0.05$  was included in the multivariate.

p: p value for **Odd's ratio** for comparing between the studied groups.

\*: Statistically significant at  $p \leq 0.05$ .

<sup>a</sup> More than one answer.

**Table 6**

Correlation Matrix between Rosenberg self-esteem scales and the primary care anxiety and depression scale between the bullying and the non bullying population.

Rosenberg Self-Esteem Scale	The Primary Care Depression Scale Anxiety and Bullying		Non Bullying	
	r	p	r	p
	-0.5867	<0.0001	-0.2136	0.0008

r: Pearson coefficient.

\*: Statistically significant at  $p \leq 0.05$ .

**Table 7**

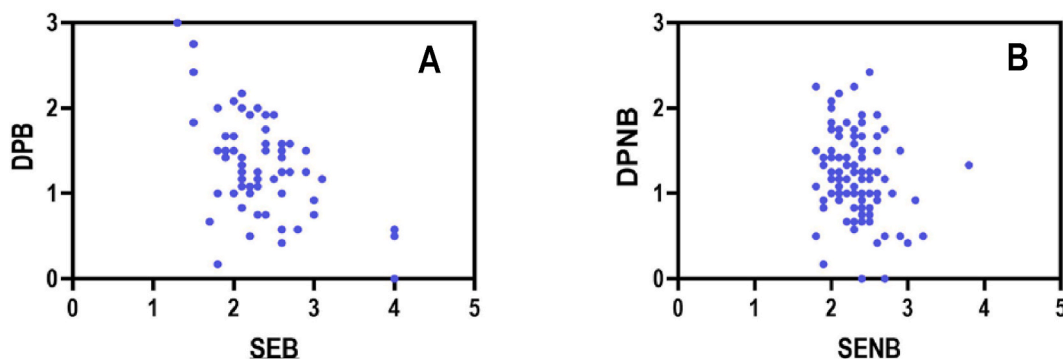
Cronbach's alpha representing the internal consistency of the study questionnaires for Rosenberg self-esteem scales and the primary care anxiety and depression scales.

	Cronbach's alpha ( $\alpha$ )
Rosenberg Self-Esteem Scale	0.622
The Primary Care Depression Scale Anxiety	0.816

**Table 8**

Rosenberg self-esteem scores and the primary care anxiety and depression scores between males and females of bullying and non bullying population.

	Average Score	Bullying Males (N = 59)	Non Bullying Males (N = 132)	Bullying Females (N = 67)	Non Bullying Females (N = 111)
Average Self Esteem score	2 and less than 2	22.03 %	18.18 %	26.86 %	15.31 %
	More than 2	77.96 %	81.81 %	73.13 %	84.68 %
Average Depression score	1.5 and less than 1.5	69.49 %	81.82 %	70.15 %	81.98 %
	More than 1.5	30.51 %	18.18 %	29.85 %	18.02 %



**Fig. 1.** Correlation Matrix between The Primary Care Anxiety and Depression Scale (DPB) and Rosenberg Self-Esteem Scale (SEB) of the bullying (A) population. Correlation Matrix between The Primary Care Anxiety and Depression Scale (DPNB) and Rosenberg Self-Esteem Scale (SENB) of the non bullying (B) population.

during their study is twice that of students in other areas [40]. Bullying prevalence in this community has previously been documented in primary research. The claimed prevalence in each of these investigations varies greatly, from 30 % to 95 % [41–47]. Hence the study population was mainly the medical students (Table 1) of various branches studying in UAE.

According to the current study, bullying was reported by 34.1 % of the sample (Table 3a). Over half of the participants (61.9 %) reported at least one instance of bullying throughout college. This exemplifies the cycle of bullying, whereby onlookers can function as “assistants/henchmen” and “reinforcements” [48]. The incidence is similar to research conducted in the United Arab Emirates, which found that 26.3 % of university students had experienced bullying [22]. Out of 19 nations, middle school kids in the UAE had the lowest bullying rate, according to another survey [24]. However, another researcher reported that 50 % of participants had experienced bullying [49]. In Turkey, it was found that 50 % of Turkish university students reported cyberbullying in the past six months in their 2019 survey [50]. However, diverse measurement tools, including definitions of bullying, students’ subjective interpretations of bullying behaviors, cultural norms, and student characteristics, can partially explain the variations in reported bullying rates in the literature.



## 5.2. Most common types of bullying among medical and health science students

It was found that face-to-face bullying, especially verbal aggression, and relational or indirect bullying, such as rumor-spreading and exclusion, remain the most common kinds of bullying [26]. The findings of the present study indicate that a majority of instances of bullying were classified as verbal bullying, with 44.4 % (Table 3a) of individuals reporting harsh and unpleasant name-calling. A Saudi Arabian study showed that verbal harassment, such as yelling, humiliation, and belittlement, is the main form of bullying [49]. Verbal and interpersonal skill improvement may have reduced direct physical aggression and increased indirect bullying in this study. Physical bullying victims may find it simpler to seek adult and peer support, reducing distress. Verbal bullying may be more complex to detect and stop, making it persistent.

Additionally, this survey found 23.8 % of cyberbullying; this finding matches other survey findings in the UAE [22]. A Midwestern study of 439 students stated that 8.6 % reported cyberbullying and 21.9 % were victims [50]. Nevertheless, 60 % of university students witnessed cyberbullying many who witness cyberbullying are unlikely to report it [51].

According to Table[3b] of the current study, verbal bullying affects females (53.58 %) more frequently than males (46.15 %). However, a study from Egypt [22] revealed that men are the most common victims of verbal bullying. Furthermore, compared to female students (12.5 %), a more significant percentage of male students, nearly 87.5 %, reported sexual bullying in this study. Another study found that men are more likely than women to be physically victimized and that men are more likely than women to engage in physical bullying [52]. Due to cultural standards, sexual assault and cyberbullying are underreported, explaining this lack of disparity. Individuals may also be unaware of cyberbullying reporting channels.

## 5.3. Reaction of the bullied participants

Students who were bullied reacted differently. Approximately 28.6 % (Table 4) of people did not respond to or report the incident, most likely out of guilt over being harmed. Others, after the bullying incident, conveyed feelings of melancholy, anxiety, fear, diminished concentration, fury, stress, and powerlessness. A study that demonstrated a connection between bullying, bullying victims, bullying cycles, and higher levels of depression symptoms, self-esteem, and suicidal thoughts also supported this finding [27,53]. Nonetheless, similar findings were obtained in other studies [22]. University students' propensity to value the opinions of their peers undermines their sense of self and leaves them open to bullying, which is the root cause of the phenomenon.

On the other hand, 27 % of the students reported the incident to a family member, while 19 % confided in a friend. It demonstrates that college students seek family and peer support in such situations. In contrast, a study revealed a negative correlation between bullying, classmates, and family support [54]. The student affairs department officially documented a few reports, maybe due to shame and expected negative consequences [55].

## 5.4. Participants' previous experience to bullying

Bullying in primary school was reported by 37.4 % of the sample in the current study (Table 4). Of those surveyed, 25.2 % reported bullying at home, while 32.5 % reported bullying in high school. As a result, a study found that severe childhood bullying affected 35 % of participants [56]. Adolescent bullying prevention is essential to preventing long-term mental health issues since psychological symptoms persist. It is possible to lessen bullying in children and stop it from worsening in adults.

More than one-third (35.8 %) of students who were asked how the institution should tackle bullying and aggressive student behavior said that there should be new regulations to deal with bullying on campus. In order to identify, inform, and assist harassed students, college administration and counseling services can also provide support groups and lecture series.

## 5.5. Regression analysis and factors that affected bullying

A linear regression analysis of bullying data (Table 5a) showed that girls are bullied at a rate of 53.2 % more frequently than boys (46.8 %), which is consistent with earlier studies [57]. However, studies show that men are more likely than women to be the victims of bullying as well as the bullies. Furthermore, empirical research indicates that males and younger students are more likely to identify with the criminal than older students and girls [58]. There was no appreciable variation in bullying based on gender. However, the year of university enrollment, the mother's education, and past bullying experience (Table 5b) were found to have a significant association with bullying, indicating that these factors strongly influenced bullying. Higher-educated people tend to have mothers with a better socioeconomic position, which may explain the phenomenon. Parents' educational attainment shows their intelligence, knowledge, cultural values, reading, and problem-solving skills. These factors may affect how parents raise their children, which may impact their social and coping skills. Social media exposure to violent content may also lead to bullying and peer aggression as people get old. There is mounting evidence that childhood bullying can have long-term adverse effects on an individual's well-being [59]. Moreover, individuals who encountered bullying prior to college were also more likely to report depression and anxiety and a lower perception of their mental and physical health [60,61].

## 5.6. Depression, anxiety, and self-esteem relations

The current findings showed an inverse correlation ( $r = -0.5867$  and  $P = <0.0001$ ) between the primary care anxiety and depression scale and the Rosenberg self-esteem measure in the bullying population as compared to the non-bullying population

(Table 6). This is consistent with earlier research [30,31]. Thus, student self-esteem may also determine social anxiety and bullying relationships. Bullying has been proven to increase adolescent depression, anxiety, and stress [54]. Another study found a statistically significant and robust correlation between bullying, anxiety, and depressive symptoms [38]. In addition, a study investigated how depression in male students in their sophomore year affected their self-esteem in their junior year [62]. It should be emphasized that depression's effect on self-esteem has varied throughout the years.

Cronbach's alpha representing the internal consistency of the study questionnaires for Rosenberg self-esteem scales and the primary care anxiety and depression scales showed acceptable alpha values (Table 7), supporting the study's findings. Though the alpha value for Rosenberg Self-Esteem Scale was found to be 0.62, a study reported alpha values ranging from 0.6 to 0.8 is deemed adequate [63]. Additionally, the current research emphasized the elevated levels of anxiety and depression observed in students who have experienced bullying. The correlation matrix plot of self-esteem and depression scores between bullying and no bullying population presented in Fig. 1(A and B) showed a visible difference in the pattern. This result is consistent with other research that has been carried out [27,38]. Additionally, it has been noted that kids who are bullied have poorer self-esteem and higher depression patterns than their peers who are not tormented, as observed in our study (Table 8). Several research studies have demonstrated a relationship between low self-esteem and a higher likelihood of experiencing bullying [64,65].

## 6. Conclusion

This study sheds light on the bullying of students at medical and health sciences colleges in the United Arab Emirates. The current study may have implications for future sector research. Identifying bullying among college students requires data collection. This study also links bullying to anxiety and sadness. Because bullying is so prevalent, universities must have thorough protocols to recognize it and support victims. Bullying has to end, and this can be achieved by teaching children martial arts, punishing offenders, and outlawing violent television. Government, educational institutions, and schools should all promote anti-bullying policies [66]. This study provides educators, government officials, and parents with crucial information while advancing our understanding of bullying behavior among university students in the medical and health sciences. The study's conclusions should guide scholars and policy-makers. Recognize behavioral issue patterns in order to develop psychosocial therapy, school-based mental health programs, and anti-bullying initiatives that are effective. Bullying prevention programs should raise victims' self-esteem in order to assist them in overcoming feelings of inadequacy and apathy. Tighten legal and policy measures at the university. Future research may make use of a comprehensive questionnaire on underreported forms of bullying, such as cyberbullying and sexual harassment—an extensive examination to identify the root causes of bullying and provide workable remedies.

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## Ethical consideration

The researchers obtained ethical approval (RAKMHSU-REC-160-2021/22-F-N) from the RAK Medical and Health Science University's Research and Ethics Committee.

## Data availability statement

The provision of data will be facilitated from the corresponding author upon request.

## CRediT authorship contribution statement

**Fatma M. Ibrahim:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Eman Abdelaziz Rashad Dabou:** Writing – review & editing, Methodology, Data curation. **Shimaa AbdulSamad:** Writing – original draft, Conceptualization. **Israa A.M. Abuijlan:** Writing – original draft, Conceptualization.

## Declaration of Competing interest

The authors assert that they do not possess any conflicting interests.

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