



Leadership Skills and their Associated Factors among Pharmacy Students at Umm Al-Qura University, Makkah, Saudi Arabia

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background: Leadership is a vital attribute for the predictive quality of care in healthcare organizations. Leadership has an effective role in improving clinical outcomes, pharmacy practice, and patient satisfaction. However, limited studies have been done on leadership among pharmacy students in Makkah. The current study was conducted to describe the leadership skills and their associated factors among pharmacy students at Umm Al-Qura University (UQU), Makkah.

Methods: An analytical cross-sectional study was done. A multi-stage stratified random sampling technique was used. Stratification considered the gender, educational program (Pharm-D or B-Pharm), and educational year. A standardized data collection sheet was used and asked about personal, sociodemographic data, the Authentic Leadership Questionnaire (ALQ), Schutte Self-Report Emotional Intelligence (SSREI) scale, Depression Anxiety and Stress Scale (DASS). Descriptive statistics were done. Inferential statistics were done using the Student's t-test and ANOVA for comparing between means. Pearson's product-moment correlations were also calculated. Multilinear regression models were constructed to determine the leadership predictors.

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Results: A total of 400 pharmacy students participated in the study. Pharmacy students had high overall leadership competencies; the mean overall score of ALQ was 57.98 ± 7.47 . The highest leadership category score was for the internalized moral skills (15.04 ± 2.43). Multiple linear regression analyses revealed that the predictors of the overall authentic leadership skills were high EI score ($B = 0.4$; 95% CI: 0.37-0.44) and absence of depression ($B = -1.48$; 95% CI: - 2.51, - 0.46). Depression was also negatively associated with self-awareness, internalized moral domains. Marital status, physical activity and father education also associated with different leadership domains.

Conclusion: The predictors of the total authentic leadership skills were the overall EI domain score and absence of depression. Training on both leadership skills, and emotional intelligence is essential. Management of depression and encouraging physical activities are needed for better leadership skills. These efforts may result in the development of highly qualified health care personnel.

Keywords: Leadership; self-awareness, internalized moral; balanced processing; relational transparency; emotional intelligence; DASS.

1. INTRODUCTION

Effective leadership is a complex and extremely valued constituent of healthcare education. It is increasingly recognized as a crucial way to deliver high standards of education, research, and clinical practice [1]. Over the past decade, leadership has become an important domain of medical education [2]. Leadership is considered a vital factor of predictive quality of care in healthcare organizations. Leadership is one of the major influences on patient safety, quality of clinical care and the shaping of healthcare culture [2]. It has an effective role in improving clinical outcomes and patient satisfaction [3,4].

Leadership is a complex and multidimensional construct demonstrating a varied set of underlying competencies [5]. The authentic leader is defined as “the one who has self-knowledge, knows his behavior, his moral values as well as the knowledge of the personal characteristics of others, and the general concern for everyone’s welfare”. Authentic leader can be defined by four dimensions: self-awareness, transparency, morals and ethics, and balanced processing. Self-awareness refers to the leaders’ knowledge of their strengths and weaknesses, their limitations, and their shortcomings. Transparency is about sharing information, feelings, and attitudes that involve leaders and subordinates. The moral and ethical perspective reflects the leaders’ behavior in line with the standards of internal moral conduct without being involved by external factors while maintaining a high standard of conduct. Finally, balanced processing concerns proper decision making after hearing the opinions of their followers [6, 7].

Leadership skills are essential for a pharmacist’s successful career. It could influence their capabilities to make changes in patients’ care by management practice through a unique set of values, knowledge, and skills. Such skills could be developed among pharmacy students [8]. Leadership is a highly desired attribute among pharmacists, and some have suggested it should be considered a professional obligation [5]. Sfantou, et al. (2017) conducted a systematic review of 18 articles and concluded that leadership is considered one of the main elements for integrity and successful coordination among healthcare professionals [9].

Globally, there is a broad recognition that Emotional Intelligence (EI) is a vital attribute of successful leaders [10-12]. EI can play a big role in enhancing the professionalism and communication skills of health care workers [13]. It has become an essential quality for pharmacists. It has also been argued that high EI accounts for over 90% of the difference between ineffective and effective leadership [14]. The leadership attributes of the pharmacists need to cultivate the EI skills; because it helps them inspiring the trust to lead, encourage teams, develop strong relationships, and ensure that high performance is delivered. EI is important for pharmacists in their leadership roles to cultivate the skills because EI helping them also to inspire trust to lead, encourage teams, develop strong relationships, and ensure that good performance is delivered [15].

Wang, et al., 2016 suggested that EI is positively correlated with self-efficacy and self-leadership. They concluded that if the students possessed a

high level of EI, they will be better in managing stressful situations [16]. The EI domains improved students' leadership skills among college students. In another recent study conducted by Haight, et al., (2017) on determining the relation between EI and leadership skills of pharmacy students. They found a positive connection between EI and leadership skills. However, higher EI students were better in collaboration and communication skills [17]. Other studies also found that EI is considered an important predictor of leadership effectiveness and leadership performance [18,19].

Nelson, et al. identified that EI is a highly significant factor for leadership. With the incorporation of the competencies related to EI in the pharmacy curriculum, the students usually have more professional and self-awareness skills. Both leadership and EI, are interrelated and are of high importance for the pharmacy students which is why there is a dire need to include both in the pharmacy curricula [19].

Several mechanisms might clarify the mental health effects of leadership. Leadership behavior that promotes a clear and inspiring vision of the future can induce positive appraisal and reduce maladaptive and mental behaviors. Seegel, et al reported an inverse association between leadership and depressive symptoms [20].

Although there are increasing concerns about the importance of leadership in different aspects of the academic life, especially among health care students, there is a very limited amount of studies done on leadership among pharmacy students especially in Makkah, Saudi Arabia.

The current study was conducted to describe the leadership skills and their associated factors among pharmacy students at Umm Al-Qura University (AQU), Makkah, Saudi Arabia.

2. METHODS

A cross-sectional study was conducted among pharmacy students at UQU, Makkah, in 2019. A multi-stage stratified random sampling technique was used. Stratification put into consideration the student's gender, educational program (Pharm-D or B-Pharm), and the educational year (from the second year to final year and clinical residency year for Pharm-D). Those who accepted to participate were recruited.

The sample size was determined using the formula for calculation sample from the cross sectional study [21,22].

$$n = \frac{Z^2 * p * q}{L^2}$$

Where "n" is the minimal calculated sample, "Z" is a constant =1.96 at 95% confidence level, and "P" was assumed to be 50 % (as the most conservative sample because there was no previous similar study in Makkah), and "q" = 1-p = 0.5. So, the minimal estimated sample size to accomplish a precision of 0.05%, at 95% Confidence Interval (CI) was 384 students, which was exceeded to reach 400 participants for the stratification purpose.

Pharmacy students at Umm Al-Qura University were informed with a brief description of the study. There was confidentiality and freedom of participation in the study.

The data collection sheet contained the followings

- 1- **Personal and socio-demographic data** as age, gender, marital status, etc.
- 2- **Habits** like smoking and exercise practicing.
- 3- **General life satisfaction**: A question asked about general life satisfaction was included.
- 4- **Authentic Leadership Questionnaire (ALQ)**: It consists of 16 questions with the responses recorded into 5- point Likert scale ranging from 1 for "strongly disagree" to 5 for "strongly agree". The questionnaire is subdivided into four domains. Questions number 1, 5, 9 and 13 refer to self-awareness; questions 4, 8, 12 and 16 on transparency; questions 2, 6, 10 and 14, to ethics and morals; and questions 3, 7, 11, and 15 relate to balanced processing. The values of each item are summed, and range from 16 to 80 points and the AL behaviors are interpreted as follows: 16-32 points (very low); 33-48 (low); 49-64 (high); 65-80 (too high) [6,7].
- 5- **Schutte Self-Reported Emotional Intelligence (SSREI)**: It is a standardized questionnaire developed by Schutte et al. (1998). It has a scale of 5-point response scale ranging from 1 "strongly disagree" to 5 "strongly agree", containing a total of 33 questions asking about 4 sub-scales which are: Emotion Perception (EP), Managing Self-Relevant Emotions (MSE), Managing Others' Emotions (MOE) and Utilizing Emotion (UE). Higher scoring of the scale representing greater levels of EI trait. SSREI have high internal consistency with Cronbach's

alpha of 0.9 and test-retest reliability of 0.78.[23]. The overall EI score was then categorized into two groups; either above average EI score ($EI \geq 110$), or average EI score < 110 . [24].

6-Depression Anxiety and Stress Scale 21 (DASS-21): It is a self-reported instrument which consists of 21 Questions; seven questions for each of anxiety, stress and depression. The responses are given on a 4-point Likert scale, ranging from zero if "I strongly disagree" to 3 if "I totally agree".

All statistical analysis was performed by SPSS version 22 (IBM, Armonk, NY, USA). Descriptive statistics was done. Independent sample t-test was used to compare between 2 means. For comparing more than two means, Analysis of variance (ANOVA) test was used. The post-hoc test was done using the Least Significant Difference (LSD) was also calculated. Pearson's product-moment correlations were also calculated. Multiple linear regression models were constructed to find the linear relationship between the study independent variables and the outcome (dependent) variable of the study which was the leadership domains. A standardized beta coefficient (B) was calculated to compare the strength of the effect of each individual independent variable to the dependent (outcome) variable. The level of significance for all statistical test was set at $P \text{ value} \leq 0.05$.

3. RESULTS

The current study was conducted among pharmacy students at Umm Al-Qura University, Makkah city. An overall 400 pharmacy students was accepted to participate in the study (response rate = 80%).

The mean age of the students was 21.61 ± 1.45 years. Results found that 45.8 % of the students were enrolled in the basic years (non-specialized students yet). While, 28.0 % of them enrolled in B-Pharm program, and 26.3% of them were Pharm-D students. About four-fifths (79.9%) of the students reported feeling academic stress, (78.9%). On the other hand, about three-fourths (72.4%) of them reported general life satisfaction.

Table (1) reveals that the mean overall score of ALQ among pharmacy students was high (57.98 ± 7.47). The highest leadership category score was for the internalized moral skills (15.04 ± 2.43). On the other hand, the lowest category

was the relational transparency skills (13.66 ± 2.44). The table also shows that the gender of the students didn't reveal any significant association ($P > 0.05$) with the four leadership skills or with the overall leadership score. On the other hand, older pharmacy students (>21 years) had a significantly ($P < 0.05$) better mean score (15.19 ± 2.64) of self-awareness leadership domain compared to the mean (14.65 ± 2.65) among younger students (≤ 21 years). Single students also obtained a significantly ($P < 0.01$) higher mean score of internalized moral (15.09 ± 2.44) compared to the married (13.25 ± 2.95). On the other hand, married students had a better mean score of the relational transparency skills (14.35 ± 1.53) than the single (13.58 ± 2.58). A statistically significant difference was present ($P < 0.05$). However, there was the absence of any statistically significant associations between the type of pharmacy program, educational year, GPA, fathers or mothers' education, the residency, and academic stress with any of the leadership skills ($P > 0.05$). On the other hand, the same table shows that students who reported general satisfaction with their life had better scores in all four leadership skills and in the overall authentic leadership score compared to other students. Highly statistically significant associations were present ($P < 0.01$). The mean total leadership score was 58.92 ± 7.25 among those who had positive life satisfaction compared to only 55.36 ± 8.61 , with a highly statistically significant difference (Student's t-test= 4.16 , $P < 0.001$).

Table (2) shows the mean scores of authentic leadership skill domains according to the habits and lifestyles of pharmacy students. Smokers had a slightly lower mean score of self-awareness and internalized moral skills. However, smoking didn't record any significant association with leadership skills. On the other hand, students who practiced physical activity showed an increase in the mean score of self-awareness skill (15.25 ± 2.51) compared to the non-physically active students (14.71 ± 2.74), with a statistically significant difference (Student's t-test = 2.01 , $P \leq 0.05$).

There was no statistical association between leadership domains and each type of physical activity, the number of days of exercise/week, or the duration of exercise/day ($P > 0.05$).

The mean scores of authentic leadership domains according to depression, anxiety, and stress (DASS), and EI score is presented in

Table (3). Anxiety didn't record any significant association with leadership skills ($P > 0.05$). On the other hand, students with depression showed a highly statistically significant ($P < 0.01$) decrease in their mean scores of self-awareness, internalized moral, relational transparency, and total leadership scores compared to non-depressed students. Similar findings were detected among students diagnosed with stress ($P < 0.05$). Stressed students also reported significantly lower scores of all those three leadership domains and in the overall leadership capacity, compared to the non-stressed students.

Regarding EI, the same table illustrates that pharmacy students who obtained above the average in overall EI score (> 110) had significantly much better scores in all four leadership capacities and the overall leadership scale. Highly statistically significant associations were present ($P < 0.001$).

Positive correlations were demonstrated from Table (4) between all sub-scale of the authentic leadership skills and all EI domains ($P < 0.001$). The strongest correlations were between the internalized moral domain of leadership with overall EI score ($r=0.659$, $P < 0.001$), followed by that between self-awareness skill and overall EI score ($r=0.609$, $P < 0.001$). The internalized moral domain had also the strongest correlation with

MSE subscale of EI score ($r=0.608$, $P < 0.001$). Moreover, this is followed by the relationship between the internalized moral leadership skill and UE domain of EI ($r = 0.580$, $P < 0.001$).

Table (5) presents results of multiple linear regression analyses. It reveals that the predictors of the total authentic leadership skills were the overall EI domain score ($B = 0.4$; 95% CI: 0.37-0.44), and absence of a depression ($B = -1.48$; 95% CI: - 2.51, - 0.46). The predictors of self-awareness domain was presence of high overall EI ($B = 0.11$; 95% CI: 0.09- 0.12) and absence of depression ($B = - 0.62$; 95% CI:-1.05: -0.19). The table shows that predictors of internalized moral were the high overall EI ($B = 0.11$; 95% CI: 0.10 - 0.12), absence of depression ($B = - 0.58$; 95% CI: -0.96 to -0.21) and the marital status ($B = -1.01$; 95% CI:-1.87 to -0.18). Both depression and marriage were negatively affected the internalized moral domain of leadership. Furthermore, the predictors of the balanced processing leadership domain were high overall EI domain ($B=0.08$; 95% CI: 0.07- 0.09), practicing physical activity ($B = 0.51$; 95% CI: 0.14: 0.88), and higher father's education ($B=0.48$; 95% CI: 0.12-0.84). Regarding relational transparency domain, high overall EI score ($B=0.48$; 95% CI: 0.06- 2.08), and being married ($B = 1.07$; 95 % CI 0.05: 2.08) were the positive predictors.

Table 1. Mean scores of authentic leadershipskill domains according personal and socio-demographic characteristics of pharmacy students, Umm Al-Qura University

Authentic Leadership Variables	Self-Awareness		Internalized Moral		Balanced Processing		Relational Transparency		Total Leadership	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Total	14.96	2.64	15.04	2.43	14.44	2.19	13.66	2.44	57.98	7.47
Gender										
Male	14.65	2.83	15.01	2.75	14.43	2.50	13.52	2.58	57.62	9.81
Female	15.07	2.56	14.98	2.37	14.42	2.03	13.67	2.47	58.18	6.73
Student's t-test: (P-value)	-1.52 (0.13)		0.11 (0.99)		0.08 (0.94)		-0.55 (0.59)		-0.89 (0.43)	
Age										
≤ 21	14.65	2.65	14.91	2.55	14.34	2.24	13.62	2.54	57.53	7.44
>21	15.19	2.64	15.06	2.46	14.49	2.14	13.62	2.49	58.36	7.48
Student's t-test: (P-value)	-2.02 (0.04)		-0.78 (0.43)		-0.69 (0.49)		0.01 (0.99)		-0.96 (0.34)	
Marital Status										
Single	14.92	2.68	15.09	2.44	14.44	2.20	13.58	2.58	58.03	7.55
Married	15.20	2.35	13.25	2.95	14.15	1.98	14.35	1.35	56.95	5.67
Student's t-test: (P-value)	-0.45 (0.65)		3.24 (0.001)		0.57 (0.56)		-2.33 (0.03)		0.63 (0.53)	

Table 1. Mean scores of authentic leadership skills according personal & sociodemographic characteristics of pharmacy students, Umm Al-Qura University (Continue)

Authentic Leadership Variables	Self-Awareness		Internalized Moral		Balanced Processing		Relational Transparency		Total Leadership	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Program Type										
Basic years	14.87	2.87	14.93	2.64	14.26	2.25	13.57	2.77	57.50	9.02
B. Pharm	15.16	2.19	15.08	2.18	14.66	1.89	13.70	2.09	58.62	5.51
Pharm-D	14.80	2.72	15.07	2.43	14.43	2.37	13.61	2.45	57.94	7.63
Student's t-test:	0.57		0.16		1.17		0.09		0.71	
(P-value)	(0.56)		(0.84)		(0.31)		(0.90)		(0.49)	
Educational year										
Second	14.88	2.87	15.15	2.49	14.36	1.78	13.83	3.10	57.93	9.19
Third	14.86	2.88	14.75	2.76	14.17	2.60	13.33	2.43	57.12	8.90
Fourth	15.28	2.69	15.01	2.48	14.56	2.43	13.68	2.60	58.55	7.84
Fifth	14.91	2.32	15.08	2.14	14.57	1.85	13.78	2.09	58.36	5.68
Sixth	14.60	2.41	15.22	2.42	14.48	2.34	13.22	2.01	57.54	6.59
ANOVA test (F):	0.48		0.43		0.53		0.82		0.47	
(p-value)	(0.75)		(0.78)		(0.71)		(0.51)		(0.75)	
Grade Point Average (GPA)										
< 3.5	14.96	2.64	14.88	2.51	14.40	2.37	13.49	2.60	57.64	8.34
≥ 3.5	14.89	2.71	15.31	2.32	14.49	1.71	13.90	2.26	58.58	6.43
Student's t	0.22		-1.58		-0.38		-1.49		-1.09	
(P-value)	(0.83)		(0.11)		(0.66)		(0.14)		(0.27)	
Father education										
< University	14.92	2.75	15.13	2.42	14.14	2.20	13.50	2.73	57.69	7.65
≥ University	14.95	2.59	14.89	2.55	14.65	2.15	13.72	2.32	58.20	7.33
Student's t	-0.12		0.96		-2.31		-0.86		-0.68	
(P-value)	(0.91)		(0.34)		(0.02)		(0.39)		(0.49)	
Mother education										
< University	15.04	2.58	15.17	2.36	14.49	2.50	13.64	2.75	58.31	7.18
≥ University	14.84	2.72	14.83	2.60	14.41	2.03	13.60	2.27	57.68	7.71
Student's t	0.71		1.40		0.26		0.13		0.84	
(P-value)	(0.48)		(0.16)		(0.79)		(0.89)		(0.40)	
Residency										
With family	14.88	2.64	14.96	2.44	14.41	2.14	13.61	2.43	57.87	7.21
Not with family	15.90	2.71	15.52	3.38	14.66	2.94	13.80	3.68	58.71	15.18
Student's t	-1.71		-0.97		-0.39		-0.24		-0.25	
(P-value)	(0.08)		(0.32)		(0.69)		(0.81)		(0.81)	
Presence of academic stress										
Yes	14.85	2.54	14.95	2.38	14.41	2.16	13.61	2.42	57.82	7.01
No	15.26	3.06	15.25	2.74	14.48	2.33	13.67	2.84	58.36	10.41
Student's t	-1.09		-0.94		-0.26		-0.23		-0.43	
(P-value)	(0.27)		(0.35)		(0.79)		(0.82)		(0.66)	
General life satisfaction										
Yes	15.16	2.70	15.30	2.39	14.56	2.13	13.89	2.24	58.92	7.25
No	14.36	2.48	14.27	2.49	14.06	2.32	12.90	2.99	55.36	8.61
Student's t	2.71		3.83		2.05		3.18		4.16	
(P-value)	(0.01)		(0.00)		(0.04)		(0.002)		(0.00)	

Table 2. Mean scores of authentic leadership skills according to habits and lifestyle of pharmacy students, Umm Al-Qura University

Authentic Leadership Variables	Self-Awareness		Internalized Moral		Balanced Processing		Relational Transparency		Total Leadership	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Smoking										
Yes	14.52	3.31	15.31	2.49	13.95	2.33	13.95	2.44	57.74	8.21
No	14.98	2.57	14.96	2.50	14.48	2.17	13.58	2.51	58.01	7.39
Student's t (P-value)	-0.87 (0.39)		0.86 (0.39)		-1.48 (0.14)		0.90 (0.37)		-0.17 (0.86)	
Physical Activity										
Yes	15.25	2.51	15.20	2.50	14.34	2.11	13.70	2.45	58.50	7.23
No	14.71	2.74	14.84	2.49	14.48	2.24	13.56	2.55	57.60	7.62
Student's t (P-value)	2.01 (0.05)		1.27 (0.20)		-0.63 (0.53)		0.55 (0.58)		1.23 (0.22)	
Types of physical activity										
Aerobic	14.72	2.75	14.85	2.49	14.48	2.24	13.56	2.55	57.61	7.64
Walking	14.85	3.98	15.57	1.90	14.00	2.38	14.00	3.11	58.42	9.81
Other	15.14	2.41	15.06	2.64	14.29	2.17	13.69	2.54	58.19	7.20
Multiple exercise	15.12	1.96	16.12	2.03	14.62	1.41	13.87	1.45	59.75	4.59
Not practice	15.61	2.64	15.30	2.28	14.54	2.06	13.64	2.28	59.10	7.39
ANOVA test (F) (P-value)	1.21 (0.31)		0.67 (0.61)		0.36 (0.83)		0.07 (0.99)		0.49 (0.74)	
Number of exercise Days										
≥3 days/ week	14.72	2.74	14.89	2.49	14.48	2.24	13.56	2.55	57.54	8.19
<3 days / week	15.27	3.05	15.20	2.16	14.37	2.58	13.62	2.77	58.48	9.48
Not practice	15.10	2.29	14.72	2.59	14.18	1.99	13.90	2.87	57.90	6.75
ANOVA test (F) (P-value)	0.83 (0.44)		0.36 (0.70)		0.38 (0.68)		0.34 (0.71)		0.19 (0.82)	
Duration of exercising										
≥ 30 minutes/ day	14.77	2.75	14.94	2.40	14.50	2.24	13.62	2.44	57.83	7.47
< 30 minutes/ day	15.20	2.63	15.09	2.62	14.27	2.12	13.72	2.46	58.12	8.56
Not practice	15.03	2.02	15.20	2.28	14.46	2.11	13.20	3.18	57.90	6.92
ANOVA test (F) (P-value)	1.18 (0.31)		0.24 (0.79)		0.48 (0.62)		0.53 (0.59)		0.06 (0.94)	

Table 3. Mean scores of authentic leadership skill domains according to emotional intelligence, depression, anxiety, stress (DASS) of pharmacy students, Umm Al-Qura university

Authentic Leadership Variable	Self-Awareness		Internalized Moral		Balanced Processing		Relational Transparency		Total Leadership	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Depression										
Yes	14.51	2.52	14.64	2.37	14.28	2.15	13.37	2.44	58.79	6.99
No	15.66	2.74	15.65	2.48	14.66	2.23	14.05	2.57	59.86	8.70
Student's t-test: (P-value)	-4.30 (0.000)		-4.00 (0.000)		-1.69 (0.09)		-2.62 (0.01)		-3.86 (0.000)	
Anxiety										
Yes	14.89	2.68	14.83	2.36	14.44	2.09	13.64	2.49	57.80	7.24
No	15.01	2.63	15.27	2.58	14.40	2.33	13.59	2.55	58.12	8.57
Student's t-test: (P-value)	-0.468 (0.64)		-1.75 (0.08)		0.17 (0.86)		0.21 (0.84)		-0.14 (0.68)	

Table 3. Mean scores of authentic leadership skills according to emotional intelligence, depression, anxiety, stress (DASS) of pharmacy students, Umm Al-Qura University (Continue)

Authentic Leadership Variable	Self-Awareness		Internalized Moral		Balanced Processing		Relational Transparency		Total Leadership	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Stress										
Yes	14.45	2.69	14.66	2.39	14.26	2.19	13.36	2.50	56.72	7.26
No	15.41	2.55	15.36	2.49	14.58	2.19	13.88	2.49	59.10	8.15
Student's t	- 3.65		- 2.85		- 1.45		- 2.06		- 3.08	
<i>(P-value)</i>	<i>(0.000)</i>		<i>(0.005)</i>		<i>(0.15)</i>		<i>(0.04)</i>		<i>(0.002)</i>	
Emotional intelligent										
Average EI	12.36	2.63	12.66	2.75	12.73	2.62	12.35	2.67	49.76	9.55
> Average EI	15.49	2.32	15.53	2.07	14.79	1.90	13.90	2.39	59.70	6.09
Student's t	- 10.05		- 9.92		- 7.68		- 4.83		- 11.12	
<i>(P-value)</i>	<i>(0.000)</i>		<i>(0.000)</i>		<i>(0.000)</i>		<i>(0.000)</i>		<i>(0.000)</i>	

Table 4. Correlations between different authentic leadership skills and emotional intelligence domains among pharmacy students at Umm Al-Qura University

Leadership skills	EI domain	Emotion Perception	Management of self-Emotions	Managing Others' Emotions	Utilizing Emotion	Total EI
Self-awareness		0.518**	0.537**	0.528**	0.505**	0.609**
Internalized moral		0.527**	0.608**	0.541**	0.580**	0.659**
Balanced processing		0.480**	0.431**	0.486**	0.428**	0.531**
Relational transparency		0.445**	0.309**	0.369**	0.234**	0.397**
Total leadership		0.65**	0.62**	0.41**	0.66**	0.64**

* Correlation is significant at the $P < 0.01$

Table 5. Multiple linear regression analyses of predictors of authentic leadership skills among pharmacy students, Umm Al-Qura University

Authentic Leadership skills	Self-awareness		Internalized moral		Balanced processing		Relational transparency		Total Leadership	
	B	CI	B	CI	B	CI	B	CI	B	CI
Overall EI (> 110)	0.11	0.09, 0.12	0.11	0.1, 0.12	0.08	0.07, 0.09	0.08	0.06, 2.08	0.40	0.37, 0.44
Depression (Yes)	-0.57	-1.07, -0.58	-0.58	-0.96, -0.21	-----	-----	-----	-----	-1.48	-2.51, -0.46
Marital Status (Married)	-----	-----	-1.01	-1.87, -0.18	-----	-----	1.07	0.05, 2.08	-----	-----
Physical Activity (Yes)	-----	-----	-----	-----	0.51	0.14, 0.88	-----	-----	-----	-----
Father education (≥ University)	-----	-----	-----	-----	0.48	0.12, 0.84	-----	-----	-----	-----
Constant	3.15	0.84, 5.457	4.26	2.32, 6.20	2.25	0.37, 4.14	3.32	1.17, 5.48	12.66	8.07, 17.26

B: Standardized regression coefficient; CI: Confidence Interval; Significant at < 0.05

4. DISCUSSION

Leaders in the field of healthcare and educational settings need to be able to respond to many global challenges [25]. The current study recruited 400 pharmacy students. The overall leadership score obtained by our pharmacy students was high. The highest leadership domain score was for the internalized moral skills (15.04 ±2.43), and the lowest one was for the relational transparency skills (13.66±2.44). The scores of most of the leadership skills obtained by the pharmacy students from the current study were better than those reported among nurses and nursing technicians from Brazil. Furthermore, participants from Brazil obtained the highest score in the “transparency” domain and the lowest in “balanced processing” skills. The discrepancy between both studies may be due to differences between both target populations or between countries [6].

Regarding gender, the present study found that there is no significant association between gender and leadership capacity. Similarly, the majority of other studies have not been able to identify any major variations in the leadership style based on gender [26, 27, 28]. Rosch, et al., conducted a study among undergraduate college students to determine their motivational levels to lead and they suggested also that leadership styles and leading motivation were not influenced by the gender of the student [29]. On the other hand, a mixed-method study conducted among 94,317 college students across the United States concluded that females significantly differ from males regarding their leadership perception [30]. There may be other factors besides gender which may influence leadership skills as personality traits. Some studies indicated that personality affects the performance of the leaders [31].

Another important factor of the leadership skills is the age. Our study results revealed that age affects the leadership self-awareness skills. Students aged ≥ 21 years had better mean scores of self-awareness than younger students. This may occur because the personal opinions and perspectives of a student may change as they grow and matures, and this may influence their leadership style. Older leaders may have a better experience, tolerance levels, and understanding of a specific situation. So, they may be able to handle uncertainties in a better way. This finding stands in the same line with the ideas of Haber’s study which suggested that

older students (aged ≥ 24 years) had better leadership skills than Younger students [30].

On the other hand, Mushtaq, et al., (2019) suggested that age had no impact on the leadership skills. Rather than age, the leadership skills of young individuals improve with their motivation levels and their ability to collaborate with a group as it molds their character and helps them to be more sociable individuals [32].

Concerning marital status, married students had a higher mean score in the relational transparency domain of leadership skills. The cause of their higher score may be due to efforts taken by people in building and maintaining their marriage relations. These efforts can positively affect the leadership potential of a student. The need for constant communication is an essential trait in leadership. On the other hand, we found no statistical association between marital status and the overall authentic leadership domain. This result is similar to previous studies. Studies of Francis and Chiyem (2017) and Ugurluoglu, et al. (2015) failed to find significant relationships between marital status and leadership capacity [33, 34]. Additionally, our study showed that single students reported having higher internalized moral skills, and balanced processing skill, but also without statistically significant differences.

Our results showed that better achievers who obtained a higher GPA (≥ 3.5) had higher total leadership scores. They had also higher scores in internalized moral, balanced processing, and relational transparency leadership domains, compared to the lower achievers. However, there were no statistically significant differences. The cause of higher leadership skills among the better achievers may be because the leadership capabilities can improve the perspective of a student in many ways. It improves their ability to think rationally, be more proactive in carrying out their duties. Moreover, a student or a young adult who has a leader tends usually owe their academic success or failure to their efforts rather than other factors like the skills of a teacher or a conducive environment for learning [35]. Bell, et al. compared leadership and academic performance among 1069 undergraduate students. They concluded that the motivational levels were the main aspects that influenced the academic performance of the students and it was influenced by the leadership skills [36].

The present study suggested that students who exercised for more than 30 minutes/ day had

improved “balanced processing leadership skills”. However, there is no statistically significant difference. This finding agrees with the results of Gutuskey, et al (2014) which suggested that physical activity improves leadership skills among students [37]. These results could explain that physical activity can substantially improve self-esteem. Students who took part of the time in practicing regular physical activities tend to have a positive body image. This can be a great boost to their confidence; which directly improves their performance as a leader. Physical activity also fosters creative thinking decision-making capability and innovation of students, which are necessary aspects of leadership [38]. The most important attribute among the qualities that a competent manager must necessarily have is EI.(25)Emotional recognizance and management in oneself and others have the potentials to build leadership capacity that can be applied in the healthcare delivery setting [39]. The current study shows the presence of highly significant positive associations between all subscales of authentic leadership and EI. Furthermore, the total authentic leadership scale had a strong positive significant correlation with the overall EI score. Multiple linear regression analyses found also the positive associations between all leadership skills and EI domains. Importantly, most of the previous researches supported our results. Haight, et al. (2017) conducted a study among 235 pharmacy students found an association between EI and leadership skills [17]. Smith, et al conducted three cohort studies before and after completing the program of Leadership Degree Option (LDO) among 36 pharmacy students of Oklahoma University. They found a significant increase in EI score at the end of LDO [40]. Similarly, another study, 2020, was done among a total of 242 students of medical and preventive care, residents, and undergraduate students who were trained in the program "Factory of Health Leaders" for evaluating the level of professional training and indicators of emotional intelligence. Results reported that students who studied in the program have better indicators of EI than had ordinary students, but their rates are comparable with residents' rates [25]. A study conducted among nurse leaders suggested that EI has a potential role in effective nursing leadership [39]. Similarly, another cross-sectional study suggested that EI had a positive impact on overall leadership skills among healthcare providers [41]. The study conducted by Apore and Asamoah (2019) also found a significant relationship between EI and transformational

leadership behavior [27]. Our results were also supported by the results of a meta-analysis that was conducted for assessing the relationship between EI with authentic leadership. They reported that individuals with higher traits of EI exhibited better authentic leadership skills [42]. Coskun, et al., (2018) and Tyczkowski, et al., (2015) both suggested similar findings among family physicians and nurse managers, receptively [43, 44].

Regarding mental conditions, bivariate analysis from the current study revealed that stress was negatively associated with all leadership skills. Similarly, the results of a study done among undergraduate students from the mid-Atlantic region of the USA indicated the self-leadership practices reduced student stress levels [45]. Our results also found that depression was negatively associated with the total authentic leadership score (and absence of depression is one the predictors of leadership skills in the multivariate analysis). Correspondingly, the study of Germany revealed that there were about 4-fold increased odds of reporting depressive symptoms for those with the lowest reported core transformational leadership [20].

Our findings revealed that anxiety was not associated with leadership skills. On the other hand, Sherman, et al. found that real leaders, who attended a unique executive education program at Harvard University, USA, had lower reports of anxiety [46]. This discrepancy may be due to differences between both target populations.

Concerning general life satisfaction, our results revealed positive associations between pharmacy students' life satisfaction and all the leadership skills (in the bivariate analysis). This result goes in line with the results of another cross-sectional survey from Turkey. They reported positive and significant correlations between the use of self-leadership strategies and life satisfaction [47].

5. CONCLUSION

A total of 400 pharmacy students participated in the study. Their mean age was 21.61 ± 1.45 years. The overall leadership score obtained by the pharmacy students was high. The highest leadership domain score was for the internalized moral skills. In bivariate analysis, age, marital status, father education, physical activity, general

life satisfaction, EI, depression, and stress were associated with some leadership skills. However, gender, GPA, residency, academic stress, smoking, mother education, duration or frequency of exercise, and the presence of anxiety didn't associate with the leadership skills. Multiple linear regression analyses revealed that the predictors of the overall authentic leadership skills were presence of the high EI score (B= 0.4; 95% CI: 0.37-0.44) and absence of a depression (B= - 1.48; 95% CI: - 2.51, - 0.46). Depression was also negatively associated with self-awareness and internalized moral domains. Married students had better relational transparency and lower internalized moral skills. Physical activity and higher father education were associated with the balanced processing leadership skill.

Colleges of pharmacy need to integrate leadership development programs within their curriculum. This is important for providing future practitioners with all the relevant skills, knowledge, and competencies through which they can implement the change. Furthermore, the students must also be taught EI so that their soft leadership skills will be enhanced; ahead of their pharmacy experience professionally. Training on both leadership competencies, and emotional intelligence is essential. The psychological well-being of the pharmacy students need to be more carefully addressed. Psychosocial support services need to be available to help both depressed and stressed students to deal and cope with their personal and social difficulties. Decrease stress is also needed. These efforts may result in the training of highly qualified pharmacists and other health care personnel.

CONSENT AND ETHICAL APPROVAL

The study was conformed to the ethical standards of Helsinki Declaration. It was approved by the Institutional Review Board (IRB) of King Abdulaziz University (KAU), with a Reference Number: 151-18. In addition, the ethical approval was obtained from the Ethics Committee Board of Pharmacy at Umm Al-Qura University, with a project number of 14907. Furthermore, Administrative approvals were taken also from Umm Al-Qura University. Approvals for using the scales were obtained from the authors. An informed written consent forms were completed from each accepted student when they enrolled to participate in the study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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