The impact of low self-esteem on academic achievement and the behaviors related to it among medical students in Saudi Arabia

Saleh A. Alghamdi, MBBS, MD, *Mohammed A. Aljaffer,* MBBS, MD, *Faisal S. Alahmari,* MBBS, *Ahmed B. Alasiri,* MBBS, *Abdullah H. Alkahtani,* MBBS, *Fadhah S. Alhudayris,* MBBS, *Bassam A. Alhusaini,* MBBS.

ABSTRACT

الأهداف: تكشف الدراسات بشكل جيد عن مدى انتشار تدني تقدير الذات بين الطلاب بشكل عام. كما أظهرت العديد من الدراسات كيف يمكن أن يؤثر تقدير الذات على سلوكيات الطلاب وتحصيلهم الأكاديمي، وتهدف هذه الدراسة إلى قياس مدى انتشار تدني تقدير الذات بين طلاب الطب في المملكة العربية السعودية وتحديد تأثيره على سلوكياتهم وتحصيلهم الأكاديمي.

المنهجية: افترضنا أن مستوى تقدير الذات ينعكس على الأداء الأكاديمي لطلاب الطب ويرتبط ببعض السلوكيات المحددة. وهذه دراسة مقطعية أجريت على طلاب كليات الطب في المملكة العربية السعودية من خلال توزيع استبيان ذاتي باستخدام منصات وسائل التواصل الاجتماعي، ويحتوي الاستبيان على البيانات الاجتماعية والديموغرافية، ومقياس تقدير الذات من روزنبرغ، واستبيان حول السلوكيات المتعلقة بتقدير الذات.

النتائج: كان الحد الأدنى المطلوب لحجم العينة هو 379 مشاركًا، لكن معدل المشاركة كان مرتفعًا وتمكنا من الوصول إلى 1099 مشاركا. من إجمالي 1099 طالب طب في الدراسة، (55.9% من الإناث و 50% من الإناث) 24.1% أظهروا تدني في تقديرهم لذواتهم. كما أظهرت الدراسة أن جنس الإناث والإصابة باضطرابات نفسية تعتبر عوامل مستقلة تزيد من احتمالية تدني تقدير الذات. ولاحظنا أيضًا أن ارتفاع المعدل التراكمي يرتبط بتقدير أفضل للذات. ومن المثير للاهتمام أنه لوحظ بأن المشاركة في المجموعات الدراسية للطلاب وحضور برامج التنمية الذاتية قدرت على أنها عوامل وقائية ضد تدني تقدير الذات.

الخلاصة: يُفترض أن واحدًا من كل أربعة طلاب في كلية الطب يعاني من تدني تقديره لذاته وأن تحسن المعدل التراكمي للطالب يؤثر بشكل إيجابي على مستوى تقدير الذات. بينما تم ملاحظة أن حضور الطلاب للمجموعات الدراسية وبرامج التطوير الذاتي تلعب دورا كعوامل وقائية لتقليل تدني تقدير الذات. هناك حاجة إلى مزيد من الدراسات لإلقاء مزيد من الضوء على هذا الموضوع المهم.

Objectives: To measure the prevalence of low self-esteem among medical students in Saudi Arabia and determine its impact on their behaviors and academic achievement.

Methods: We hypothesized that the level of self-esteem reflected on the student's academic performance and linked to some of their behaviors. A cross-sectional study was carried out among students of the medical colleges in Saudi Arabia. A self-administered questionnaire was distributed electronically using social media platforms, socio-demographic data, Rosenberg's self-esteem scale, and a questionnaire about self-esteem-related behaviors.

Results: Of 1099 participants (55.9% females and 50% males), 24.1% showed low self-esteem. Independent significant predictors of low self-esteem were female gender and diagnosis with mental illness. Increasing GPA was associated with better self-esteem. Participating in students' study groups and attending self-development programs were estimated to be the protective factors against low self-esteem.

Conclusion: One-quarter of medical students are assumed to have low self-esteem. Improved GPA ratings positively influence self-esteem, while attending students' study groups and self-development programs were identified as protective factors for low self-esteem. Further studies are needed to shed more light on this important topic.

Keywords: self-esteem, Rosenberg self-esteem scale, behavior, medical students

Address correspondence and reprint request to: Dr. Faisal S. Alahmari, College of Medicine, Imam Mohammad Ibn Saud Islamic University, Riyadh, Kingdom of Saudi Arabia. E-mail: Faisal-alahmari2016@hotmail.com ORCID ID: https://orcid.org/0000-0003-1256-4981

Self-esteem is an individual's sense of satisfaction with oneself and reflects the relationship between personal self-image and ideal self-image.[1] Self-esteem is a measure of self-assessment because it is considered the most important psychological formula.[2] Self-esteem has 2 types, specific and global. Global self-esteem is more relevant to the psychological aspect, while specific self-esteem (academic) is more relevant to behavior and is a tool for evaluating academic achievements.[3]

Behaviors are defined as external changes or activities of living organisms that are functionally mediated by other external phenomena in the present moment.[4] Behaviors must be considered because people might have specific behaviors toward an object as a whole and toward specific facets of that object. Behaviors have both directions (such as positive or negative orientation) and intensity, as shown by the fact that behaviors are affected.[3]

High self-esteem is the belief that one is worthy of privilege and admiration by others for being unique and special and possessing fantasies of brilliance and beauty. It is considered a heterogeneous category. High self-esteem is not entirely responsible for academic successes and achievements but rather is a result of these or a partial reason for those successes and helps to facilitate perseverance and diligence after failure.[5]

Low self-esteem is the contradiction between the competitive aspects of the self, such as between the real and ideal selves. Also, between the self as seen by oneself and as seen by significant others, a person monitors and evaluates one's behaviors and competencies to determine self-efficacy. This condition leads to psychosocial weakness and lack of self-confidence, creating problems and risky behaviors.[6] Low self-esteem is considered one of the risk factors for depression and anxiety, eating disorders, violence and educational exclusion, and drug abuse.[7,6]

A student's academic performance is measured by grade point average (GPA), high school graduation rate, annual standardized tests, and college entrance exams. A person's achievement in school, college, or university indicates how well they performed in activities meant to help them achieve certain goals. School systems mostly define cognitive goals across multiple subject areas (such as critical thinking) or include the acquisition of knowledge and understanding in a specific intellectual domain (such as: numeracy, literacy, science, and history).[8]

Many studies have shown the association between self-esteem and students' academic achievement and how self-esteem is affected. One factor that can negatively impact self-esteem is the experience of imposter syndrome, characterized by feelings of inadequacy and a persistent fear of being exposed as a fraud, despite evidence of competence.[9] Locally, a study was carried out at King Saud University (KSU) to determine the prevalence of self-esteem and imposter syndrome among KSU medical students.[9] The study revealed prevalent low self-esteem and positive imposter syndrome in 23.6% and 42.1% of participants, respectively.[9] These findings suggest that imposter syndrome may be a significant barrier to academic success for a significant proportion of medical students at KSU, highlighting the importance of addressing this issue in educational settings.[9]

A recent cross-sectional study carried out at Princess Nourah bint Abdulrahman University (PNU) in 2019 found that there is a weak relationship between self-esteem and academic achievement.[10] Another cross-sectional study carried out at Taif University and King Abdulaziz University determined that self-esteem showed a low but significant correlation with academic performance.[11]

Globally, a study at Jimma University, Ethiopia, assessed the prevalence and associated factors of low self-esteem (LSE) and mental distress among medical students and showed that students with poor academic achievement were also more likely to have LSE.[12] Moreover, students' self-esteem, self-efficacy, and academic performance were also assessed among students in the United Arab Emirates (UAE),[13] and found that academic achievement was associated with high academic self-efficacy. Another study in Pakistan in 2015 showed a significant relationship between self-esteem and academic performance.[13,14]

Methods. A cross-sectional study was conducted from March 2022 to December 2022 among Saudi and non-Saudi medical students in 5 regions (North, South, East, West, and Central) of Saudi Arabia. Medical students who attended a government and private medical college in Saudi Arabia were recruited. Inclusion criteria included any current medical student, male or female, who studies in Saudi Arabia. At the same time, participants who were non-medical or medical students not studying in Saudi Arabia were excluded.

The sample size was estimated using the sample size formula, assuming that 50% would be the response

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distribution, 95% confidence level, and 5% margin of error, resulting in a sample size of 379. A convenience sampling technique was used. A self-administered questionnaire (online survey) including Rosenberg's self-esteem scale questionnaires and behavior related to low self-esteem questionnaire was distributed electronically using social media platforms. Participation in this study was voluntary; each participant was notified to consent and was invited to participate. Participants did not earn a material income due to their participation as it would adhere to the tenets of the Declaration of Helsinki, 2013.

The questionnaire was divided into 3 categories. The first part inquired regarding the participant's demographic data, the second part of information on academic performance (GPA) and self-esteem, and the last part of the questionnaire was regarding the participant's behaviors dealing with low self-esteem. The self-esteem of the medical students and their related behaviors was assessed by using Rosenberg's self-esteem scale[15] (10 items) and behavior related to low self-esteem questionnaire (26 items). Rosenberg's self-esteem scale questionnaire contains a 4-point Likert scale ranging from "strongly disagree" coded as 0 to "strongly agree" coded as 3, while the behavior questionnaire has a category ranging from "strongly disagree" coded with 1 to "strongly agree" coded with 4.

A pilot study was carried out among 39 participants to determine the internal consistency of the study questionnaires. The Rosenberg's self-esteem scale with ten items has a reliability result of 0.777 Cronbach Alpha (77.7%), indicating a generally good internal consistency. Compared with the behavior towards low self-esteem with 26 items, the reliability result was 0.905 Cronbach Alpha (90.5%), indicating excellent internal consistency. The overall reliability test was 0.841 Cronbach Alpha (84.1%), suggesting good internal consistency. Thus, the questionnaires were valid to be used in this study.

The study was approved by the Institutional Review Board approval at the Medical Research Unit, Faculty of Medicine, Al-Imam Mohammad ibn Saud Islamic University, Riyadh, Saudi Arabia. Participation in this study is completely voluntary; each participant is notified to consent and is invited to participate. Participants do not earn a material income due to their participation. Review Board at Al-Imam Mohammad ibn Saud Islamic University (Research Project No. 201/2022). All ethical considerations were taken into account. Informed consent was obtained.

Statistical analysis. The data were gathered, entered, and analyzed by the Statistical Packages for Software Sciences version 26 (IBMCorp, Armonk, NY, USA). Descriptive statistics were calculated and summarized as numbers, percentages, mean, and standard deviation. The differences in the level of self-esteem and behavior were analyzed using an independent sample t-test. A Chi-square test was also used to determine the relationship between the level of self-esteem and the socio-demographic characteristics of the medical students. Significant results were then tested in a multivariate regression model to determine the significant factor associated with low self-esteem with a corresponding odds ratio and a 95% confidence interval. A *p*-value of <0.05 (2-sided) was used to indicate statistical significance.

Results. In total, 1,099 medical students were recruited. Half of them (50%) were aged between 21 to 23 years. Around 55.9% were females and mostly single (92.2%). Nearly all (89.4%) were studying in a government medical institution. Further, 33.4% were living in the Central region. Approximately 23.6% were in the 5th year of their studies, with 28.5% having GPA ratings between 4 to 4.49. The majority (73.2%) had a personal monthly income of 1,000 to 2,000 SAR. Participants who were living with family constituted 84.2%. The prevalence of smoking participants was 20.3%, while those with associated chronic diseases were 12.3%. In addition, the proportion of medical students who had been diagnosed with mental illness was 18.2%, and of them, the most commonly known mental illness was depression (46.5%) (Table 1).

In the assessment of Rosenberg's self-esteem scale, it was observed that the rating was higher in the statement "I feel that I have a number of good qualities" (mean score: 2.27), followed by "I am able to do things as well as most other people" (mean score: 2.20) and "I feel that I'm a person of worth" (mean score: 2.03). The total mean score for self-esteem was 17.9 (SD 5.38), with 67.2% classified as having normal self-esteem, 8.7% having high, and 24.1% having low self-esteem (Table 2).

A low self-esteem level was more associated with a higher score in behaviors related to low self-esteem, such as self-injury behaviors (*p*<0.001), suicidal behaviors (*p*<0.001), procrastination (*p*<0.001), avoiding certain situations or people (*p*<0.001), quitting tasks partially (*p*<0.001), rushing through work (*p*<0.001), displaying an "I do not care" attitude (*p*<0.001), trying to please others all the time (*p*<0.001), acting angrily if mistakes are made (*p*<0.001), being unable to say no (*p*<0.001), frequently putting oneself down while speaking

Table 1 - Socio-demographic characteristics of the medical students (N=1099).

Study variables	n (%)
Age group	
18 – 20 years	187 (17.0)
21 – 23 years	549 (50.0)
24 – 26 years	311 (28.3)
>26 years	52 (04.7)
Gender	
Male	485 (44.1)
Female	614 (55.9)
Marital status	
Single	1013 (92.2)
Married	68 (06.2)
Divorced	16 (01.5)
Widowed	02 (0.2)
Type of institution	
Government medical college	983 (89.4)
Private medical college	116 (10.6)
Region of medical college	
Central Region	367 (33.4)
Northern Region	227 (20.7)
Southern Region	229 (20.8)
Eastern Region	140 (12.7)
Western Region	136 (12.4)
Academic year level	
1st year	119 (10.8)
2nd year	131 (11.9)
3rd year	209 (19.0)
4th year	214 (19.5)
5th year	259 (23.6)
Intern	167 (15.2)
Grade point average	
4.75–5	230 (20.9)
4.5–4.74	229 (20.8)
4–4.49	313 (28.5)
3–3.99	278 (25.3)
2.99 or less	49 (04.5)
Personal monthly income (SAR)	
1000-2000	805 (73.2)
2000-3000	91 (08.3)
3000-4000	37 (03.4)
4000-5000	26 (02.4)
>5000	140 (12.7)
Extra income	
Yes	366 (33.3)
No	733 (66.7)
Source of extra income (n=366)	
Family support	301 (82.2)
Part-time job	38 (10.4)
University bonus	14 (03.8)
Others	13 (03.6)
Living status	
With my family	925 (84.2)
With a colleague	63 (05.7)
I live alone	111 (10.1)
Smoking	
Yes	223 (20.3)
No	876 (79.7)
Associated chronic disease	
Yes	135 (12.3)
No	964 (87.7)
Diagnosed with mental illness	
Yes	200 (18.2)
No	899 (81.8)
Specific mental illness (n=200)	
Psychosis	22 (11.0)
Bipolar	17 (08.5)
Depression	93 (46.5)
Anxiety	55 (27.5)
Phobia	02 (01.0)
Others	11 (05.5)

Table 2 - Assessment of Rosenberg's self-esteem scale questionnaire (n=1099).

Self-esteem Statement	Mean±SD
1. On the whole, I am satisfied with myself	
2. At times I think I am no good at all †	
3. I feel that I have a number of good qualities	
4. I am able to do things as well as most other people	
5. I feel I do not have much to be proud of †	
6. I certainly feel useless at times †	
7. I feel that I'm a person of worth	
8. I wish I could have more respect for myself †	
9. All in all, I am inclined to think that I am a failure †	
10. I take a positive attitude toward myself	
Total self-esteem score	17.9 ± 5.38
Level of self-esteem	
Low (<15 points)	265 (24.1%)
Normal (15-25 points)	738 (67.2%)
High (>25 points)	96 (08.7%)

Response has a range from "strongly disagree" coded with 0 to "strongly agree" coded with 3. † Score was reverse coded.

($p<0.001$), and attending self-development programs ($p<0.001$) (Table 3).

When measuring the relationship between the level of self-esteem and the socio-demographic characteristics of the medical students, it was found that the prevalence of low self-esteem was significantly more common among the female gender ($p<0.001$), GPA ratings of 4 to 4.49 ($p=0.039$) and diagnosed with mental illness ($p<0.001$) (Table 4).

In a multivariate regression model, it was observed that compared to males, the chance of having low self-esteem among females was predicted to increase by at least 1.8 times higher (AOR=1.851; 95% CI=1.365 – 2.511; $p<0.001$). Also, compared to medical students without the diagnosis of mental illness, the chance of having low self-esteem among those diagnosed with mental illness was predicted to increase by at least 1.9 fold higher (AOR=1.971; 95% CI=1.408–2.759; $p<0.001$). Further, compared to medical students with the lowest GPA ratings (GPA 2.99 or less), the chance of low esteem among students with GPA ratings between 3 to 3.99 was estimated to decrease by at least 70% (AOR=0.308; 95% CI=0.155 – 0.612; $p=0.001$), and by almost 40% in GPA ratings of 4 to 4.99 (AOR=0.574; 95% CI=0.365 – 0.894; $p=0.014$), but it did not reach statistical significance in GPA ratings between 4.75 to 5 ($p=0.173$) (Table 5).

Discussion. This study evaluated the self-esteem of medical students, the behaviors related to it, and how

Table 3 - Low self-esteem's related behaviors (N=1099).

Behavior statements	Level of self-esteem		P-value*
	Low	Normal/High	
	Mean±SD		
Seeking professional (medical) help	2.63±0.88	2.68±0.92	0.511
Attaching to students' study groups	2.37±0.88	2.69±0.89	<0.001**
Attending self-development programs	2.26±0.91	2.67±0.93	<0.001**
Using illicit drugs (alcohol, amphetamine, and so on)	1.49±0.86	1.47±0.85	0.719
Self-medication to increase my self-esteem	2.03±1.01	1.99±1.03	0.579
Self-injury behaviors	1.82±0.96	1.57±0.87	<0.001**
Suicidal behaviors	1.86±0.99	1.50±0.86	<0.001**
Procrastination	3.03±1.07	2.42±1.06	<0.001**
Avoiding certain situations or people	3.27±0.88	2.87±0.86	<0.001**
Quitting tasks partially	2.94±0.87	2.50±0.87	<0.001**
Rushing through work	2.85±0.89	2.56±0.82	<0.001**
Displaying an "I don't care" attitude	2.98±0.94	2.59±0.93	<0.001**
Trying to please others all the time	2.72±1.00	2.35±0.95	<0.001**
Working excessively hard at everything I do	2.72±0.97	2.83±0.85	0.079
Trying to be perfect all of the time	3.01±0.91	2.92±0.87	0.167
Excessive competitiveness	2.57±0.99	2.57±0.90	0.999
Acting angrily if mistakes are made	2.94±0.94	2.57±0.88	<0.001**
Being unable to say no	2.83±0.93	2.49±0.91	<0.001**
Frequently putting yourself down when you speak	2.96±0.85	2.26±0.89	<0.001**
Dismissing your thoughts as unimportant to others	3.01±0.81	2.33±0.89	<0.001**
Avoiding giving your opinion or expressing your feelings	3.000.90	2.43±0.89	<0.001**
Seeking sympathy from others	2.17±0.96	2.03±0.91	0.027**
Getting other people to do things for you because you believe you aren't capable	2.20±0.99	1.89±0.92	<0.001**
Acting in an aggressive way (such as shouting, and so on)	2.34±0.96	2.03±0.95	<0.001**
Blame others for the negative way you feel about yourself	2.28±0.99	2.00±0.93	<0.001**
Being defensive when others give you constructive criticism or feedback	2.55±0.93	2.25±0.91	<0.001**

Response has a range from "strongly disagree" coded with 1 to "strongly agree" coded with 4. *P-value has been calculated using an independent sample t-test. **Significant at p<0.05 level.

academic performance affects self-esteem. The findings of this study revealed that nearly one-fourth (24.1%) of the medical students demonstrated low self-esteem, 67.2% were normal, and only 8.7% had high self-esteem; this was consistent with the study of Alsaleem et al.[9] According to their report, low self-esteem was found in 23.6% of the medical students, and this has been experienced mainly by students who were in the early years of the academic year levels, specifically females; this has been concurred by Gidi et al[12] wherein 19% of the medical students exhibited low self-esteem and 19.7% were distressed. Self-esteem would have been affected by medical students' mental health conditions, which could lead to Low self-esteem. Thus, early intervention is imperative for those showing signs of low self-esteem. Coping strategies to boost student morale could be one of the most essential steps to improving learners' self-esteem. Another study showed that students are at the edge of self-criticism and low self-esteem, to the extent that they do not even feel themselves capable of undertaking tasks within their abilities.[16] Furthermore,

another study highlighted those medical students had high levels of distress for multiple reasons, and they exhibited low self-esteem. It was also found that nearly one out of 2 medical students suffered from burnout issues.[17] Another study carried out in China included 30,817 Chinese medical students and found that these medical students had a relatively low prevalence of eating disorders but a high prevalence of depression, anxiety, and suicidal ideation.[18]

Female medical students who had been diagnosed with mental illness were the significant recipients who suffered from low self-esteem. Consistent with the present findings, a study carried out among health science students in Riyadh[10] reported that any students with an underlying disease were predicted to exhibit signs of low self-esteem and had more negative feelings than normal students. Another study carried out in Pakistan[14] revealed a significant difference in self-esteem scores between males and females, suggesting that male university students demonstrated higher self-esteem scores than female university students. In contrast,

Table 4 - Association between the level of self-esteem and the socio-demographic characteristics of the medical students (N=1099).

| Factor | Level of self-esteem | | P-value§ |
	Low (n=265)	Normal/ High (n=834)	
Age group			
≤23 years	178 (67.2)	558 (66.9)	0.937
>23 years	87 (32.8)	276 (33.1)	
Gender			
Male	88 (33.2)	397 (47.6)	<0.001**
Female	177 (66.8)	437 (52.4)	
Type of institution			
Government medical college	237 (89.4)	746 (89.4)	0.995
Private medical college	28 (10.6)	88 (10.6)	
Region of medical college			
Central Region	89 (33.6)	278 (33.3)	
Northern Region	52 (19.6)	175 (21.0)	
Southern Region	51 (19.2)	178 (21.3)	0.783
Eastern Region	39 (14.7)	101 (12.1)	
Western Region	34 (12.8)	102 (12.2)	
Academic year level			
Junior students	109 (41.1)	350 (42.0)	0.810
Senior students	156 (58.9)	484 (58.0)	
Grade point average			
5-4.75	43 (16.2)	187 (22.4)	
4.74-4.5	53 (20.0)	176 (21.1)	
4.49-4	80 (30.2)	233 (27.9)	0.039**
3.99-3	70 (26.4)	208 (24.9)	
2.99 or less	19 (07.2)	30 (03.6)	
Personal monthly income (SAR)			
≤2000	198 (74.7)	607 (72.8)	0.535
>2000	67 (25.3)	227 (27.2)	
Extra income			
Yes	78 (29.4)	288 (34.5)	0.125
No	187 (70.6)	546 (65.5)	
Living status			
With my family	19 (82.6)	706 (84.7)	
With a colleague	20 (07.5)	43 (05.2)	0.344
I live Alone	26 (09.8)	85 (10.2)	
Smoking			
Yes	52 (19.6)	171 (20.5)	0.756
No	213 (80.4)	663 (79.5)	
Associated chronic disease			
Yes	38 (14.3)	97 (11.6)	0.242
No	227 (85.7)	737 (88.4)	
Diagnose with mental illness			
Yes	75 (28.3)	125 (15.0)	<0.001**
No	190 (71.7)	709 (85.0)	

§*P-value has been calculated using Chi-square test, **significant at p<0.05 level.*

Table 5 - Multivariate regression analysis to determine the independent significant factor associated with low self-esteem (N=1099).

Factor	AOR	95% CI	P-value
Gender			
Male	Ref		
Female	1.851	1.365 – 2.511	<0.001**
Grade point average			
5-4.75	0.726	0.458 – 1.151	0.173
4.74-4.5	0.614	0.401 – 0.941	0.025 *
4.49-4	0.574	0.368 – 0.894	0.014**
3.99-3	0.308	0.155 – 0.612	0.001**
2.99 or less	Ref		
Diagnose with mental illness			
Yes	1.971	1.408 – 2.759	<0.001**
No	Ref		

AOR: adjusted odds ratio, CI: confidence interval. **Significant at *p*<0.05 level.

that there may even be cases where high-achieving students have low levels of subjective well-being.[19] More investigations are warranted to establish the level of self-esteem in males and females with underlying diseases.

Several papers concluded that low self-esteem correlated to poor academic performance. For instance, Alyami et al[11] documented that there was a weak but significant correlation between self-esteem and academic performance along with self-efficacy. Studies conducted by Afari et al[13] and Correlating[20] found a positive association between global self-esteem and academic self-efficacy, while academic achievement might positively influence academic self-efficacy. Another study published by Hyseni Duraku and Hoxha[21] noted that a higher level of self-esteem was influenced by a student's success. This is also true for the current study, as it was found that medical students' increased academic GPA ratings were correlated with better self-esteem. However, a study published by Baumeister et al[5] clarified that the moderate links between school performance and self-esteem do not suggest that high self-esteem was due to good performance at school; instead, it is just partly the result of good school performance. Further, it was indicated that attempts to lift students' self-esteem did not indicate increasing academic performance and might sometimes be the opposite. Similarly, another study revealed that increased academic performance was moderately and significantly associated with student engagement.[22]

When measuring the possible behaviors related to self-esteem, it was also discovered that students who frequently attended a study group and self-development

a study on Chinese medical students does not show significant differences among the genders.[18]

A different study found that students who perform well academically may not necessarily have high subjective well-being levels. In fact, the study suggests

programs might have better self-esteem than the other students. In a study published by Mete,[24] among secondary-level science students, it was observed that positive coping and projective coping strategies were seen among students, while students shown to have non-coping strategies were predicted to impact self-efficacy negatively. However, the fear of losing one's self-esteem negatively affected self-efficacy. In a review article published by Baumeister et al[5] they discovered that people with high self-esteem asserted themselves as more likable, more attractive, could have better relationships, and had a higher impression on others. However, objective measures contradicted these beliefs. Another study by Li J et al[24] showed that self-esteem is mediated by social support and improves emotional exhaustion and academic achievement.

Students in medical schools might be prone to adversities that affect their mental condition. Therefore, issues that affect their mental health should be discussed and addressed. Strategies to improve students' self-esteem are vital in educational systems. Hence, the role of mental health services is imperative.

Although our study addresses an important topic that needs to be adequately studied in Saudi Arabia, it has certain limitations. The researchers developed the behavioral questionnaire; hence, it was not a well-established, standardized questionnaire. Additionally, the online questionnaire distribution usually bears a higher degree of selection bias. Moreover, generalizability was limited because the findings based on a survey included medical students residing exclusively in Saudi Arabia. In addition, the study tried to reveal the behaviors linked to low self-esteem among medical students without addressing the explanation of that behaviors. To overcome the following limitations, we recommend generating a standardized questionnaire that can be generalized to any country or center. Moreover, if additional studies are to be conducted regarding this topic, reporting the explanation of that behaviors can be beneficial to build more research on it.

In conclusion, one out of 4 medical students was assumed to have low self-esteem. Female medical students who had been diagnosed with mental illness were found to demonstrate low self-esteem more than others. Further, the improved GPA ratings positively influenced self-esteem, while positive behavior towards attending students' study groups and self-developmental programs were identified as protective factors for low self-esteem. Low self-esteem is negatively affected by the mental condition of medical students. Hence, improved behavior among this group of students is vital to boost self-esteem in addition to periodic counseling. More research is needed to shed more light on the self-esteem of medical students, their behavior on it, and how it correlates to academic performance.

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