Career Regret and Health-Related Quality of Life among Medical Students: A Nationwide Cross-Sectional Study in Jordan

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ABSTRACT

OBJECTIVES: Medical students have a lower quality of life (QoL) when compared to the general population. This lower QoL is associated with multiple factors such as burnout and depressive symptoms. QoL can be reflected in the degree of career satisfaction and career regret. We aim to study the prevalence of career regret in Jordanian medical students and its association with QoL and other related factors

METHODS: This national cross-sectional study consisted of an anonymous online survey distributed to medical students enrolled in all six Jordanian medical schools over a period of 6 weeks. A validated tool was used to assess QoL and students were asked a series of questions related to their career satisfaction and career regret.

RESULTS: A total of 544 medical students completed the survey. The mean age was 21.5 ± 1.63 years (range 17-29), with 45.6% being males. The overall mean physical health score was 45.9 ± 5.17, and the overall mean mental health score (mental component summary (MCS)) was 42.04 ± 5.52. 76.3% of students have regretted studying medicine, citing stress as the main reason. There was a significant relation between the year of study and the percentage of career regret. Additionally, mean MCS was significantly lower in students who were frequently or always thinking about dropping out of medical school.

DISCUSSION: The high percentage of career regret and the low mental QoL in Jordanian students are alarming findings, highlighting an underlying source of psychological distress in Jordanians. This calls for further investigations into the psychological health of medical students, as well as interventions to prevent the development of consequences that can impact both students and their future patients.

KEYWORDS: Regret, quality of life, medical students, medical education, developing countries, stressors, health policy

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Introduction

Students are motivated to choose medicine for several reasons. Some reasons include, but are not limited to, altruistic purposes and a desire to help others,[1] prestige and occupational opportunities,[2] and familial influence.[3] However, it is undoubtedly a more challenging career choice with a demanding lifestyle.[4]

Despite students' awareness of the difficulties of medical school and their future medical careers, such as its time-consuming nature and difficult subjects, many students still valued the humanistic aspect of medicine and desired to help others.[5] However, a significant number of individuals also choose to study medicine for reasons other than their passion for the specialty.[6] In India, earning respect in society followed by making family members happy and proud were the most common motivational factors for taking up the medical profession. Although a huge number of students enrolled due to self-interest, almost 40% of students had regrets, most commonly due to lifelong reading.[7] In Pakistan, the most prevalent reason for selecting the medical profession was a desire to please one's parents, followed by the perception that it was a better career, and a personal desire to practice medicine. Nearly 40% of students, the majority of whom are females, regretted their career choice.[3]

This regret could also be related to the overall decreased satisfaction and quality of life (QoL) of medical students around the world; however, the prevalence varies by region, where medical students in developed countries are more satisfied than those in developing countries.[8] QoL is a broad concept that encompasses the physical, emotional, social, and material well-being to provide a comprehensive measure of health.[9] It has been reported that medical students have a lower QoL than the general population[10] and exhibit depressive symptoms more frequently when compared to the general population.[11] There have been numerous studies on different coping behaviors to improve students' emotional, mental, and physical health. A study in Brazil discovered that group fitness exercise

significantly reduced stress and depression in medical students compared to those who exercised alone or did not exercise at all.[12] In another study, a short yoga intervention was reported to improve overall health and depressive symptoms in medical students.[13] The concept of emerging adulthood may also play a role, as individuals within the age range of emerging adulthood (18-29 years of age) are at an unstable point of life, with mental health systems not currently adapted for individuals of this age group.[14] With medical school being a form of higher education, this transitional phase introduces its own challenges for students.[15]

Burnout, which can be defined as a triad of exhaustion, cynicism, and feelings of inefficiency, is another prevalent phenomenon that is associated with general distress, poor academic performance, and college dropout.[16] Furthermore, poor academic performance during medical school may strongly be associated with dropping out.[17] In medical students, the estimated prevalence of burnout is estimated to be 44.2%, with a slightly higher prevalence in the Middle East.[18] Students who exhibit higher symptoms of burnout were less satisfied with their studies and had stronger intentions of dropping out.[19]

Considering the link between burnout, intentions of dropping out, and less career satisfaction, which we have defined in our study as career regret, we aimed to evaluate the medical career regrets in Jordanian medical students and their association with QoL. Furthermore, we aimed to study the factors associated with these ideas of career regret.

Methodology

Study design and population

This research is designed as a cross-sectional study. An anonymous, online questionnaire was developed on Google forms. The researchers, comprised of medical students from various medical schools, distributed the survey to medical students currently enrolled in all six medical schools in Jordan via social media platforms targeting student groups. Data was collected between 25 September 2021 and 5 November 2021 via a convenience sampling method. According to the Jordanian Ministry of Higher Education and Scientific research, the approximate number of medical students currently enrolled in Jordan is around 9000. Using a confidence interval of 95% with a 5% margin of error, an expected response rate of 50%, our minimum required sample was 369 students. To increase the power of our study, we collected surveys from 544 students, giving us a response rate of 6%.

Study tool

The questionnaire is split into three sections. The first section involves sociodemographic information including age, gender, name of the university, year of study, living condition, grade point average (GPA), parents' working field, tuition programs, average hours they sleep and study in a day, and whether medicine was their first choice or not. The second section assesses the students' physical and mental QoL. The third section assesses career regret and satisfaction through a series of questions using a 5-point Likert scale. For the students' QoL, the Short Form 12 (SF-12) Questionnaire version 2 was used.[20] The (SF-12) health survey consists of 12 questions that measure various dimensions of QoL, which are then scored and classified into two components: physical health score, also known as physical component summary (PCS), and mental health score, also known as mental component summary (MCS). The study tool is a self-report of the following dimensions: physical functioning, role limitations due to physical and emotional health problems, freedom from bodily pain, general health perception, vitality, social functioning, and mental health. This questionnaire is used to assess QoL at population levels and has previously been used on medical students.[21] For the third section, questionnaire items were adopted from peer-reviewed articles.[22,23]

A pilot study was performed on 20 participants to assess the questionnaire's internal consistency and ensured that it was clear and easy to comprehend. Accordingly, the survey was reviewed again to ensure the validity of the construction prior to distribution, and the Cronbach coefficient α was 0.846 for the third section of the survey. The 20 participants in the pilot study were excluded from the main study and subsequent analyses.

Ethical considerations

Ethical approval for this project was provided by the Institutional Review Board of Jordan University Hospital (19/2021/954, 2021). This study was done in accordance with the Declaration of Helsinki. Before starting the survey, participants read a brief description of the aim of the research, the anonymity of the questionnaire, and that they reserved the right to withdraw from the survey at any time. All participants provided written informed consent by pressing "Next" in the online questionnaire and moving to the following page containing the first set of questions.

Statistical analysis

SPSS version 26.0 (Chicago, USA) was used for statistical analysis. Variability analysis in the form of the mean ± standard deviation was used to describe age. Standard descriptive statistical parameters were calculated for sociodemographic characteristics, and responses to questions answered along an ordinal 5-point Likert scale were reported as counts (frequencies). Percentage values were calculated on the study level. The reliability of the questionnaires was computed via Cronbach's alpha. The chi-square test was used to analyze the relationship between several study parameters. Pearson correlation coefficient was used to test to find the correlation between the age to the PCS and MCS scales. We performed

Table 1. Sociodemographic of the study population.

		N (%)
Age (years)	≤21	253 (46.5)
	>21	291 (53.5)
Gender	Male	248 (45.6)
	Female	296 (54.4)
Name of your university	Jordan University of Science and Technology	129 (23.7)
	University of Jordan	124 (22.8)
	Al Balqa Applied University	112 (20.6)
	Hashemite University	111 (20.4)
	Yarmouk University	39 (7.2)
	Mutah University	29 (5.3)
Year of study	First year	8 (1.5)
	Second year	55 (10.1)
	Third year	87 (16)
	Fourth year	125 (23)
	Fifth year	107 (19.7)
	Sixth year	162 (29.8)
GPA	Excellent	213 (39.2)
	Very good	208 (38.2)
	Good	106 (19.5)
	Fair	3 (0.6)
	I prefer not to say	14 (2.6)
Do either of your parents work in the medical field?	Yes	119 (21.9)
	No	425 (78.1)
Living condition	Living with parents	423 (77.8)
	Living alone	80 (14.7)
	Living with friends or colleagues	41 (7.5)
Was medicine your first choice?	Yes	442 (81.3)
	No	102 (18.8)
On average, how many hours do you study in a day?	≤5 h	391 (71.9)
	>5 h	153 (28.1)
On average, how many hours do you sleep in a day?	≤7 h	354 (65.1)
	>7 h	190 (34.9)

GPA: grade point average.

an independent sample t-test to analyze the mean difference between variables. One-way ANOVA was used to compare values between the sociodemographic and 5-point Likert scale, and the PCS and MCS, and we presented data in mean (standard deviation). A *P*-value of <0.05 was considered statistically significant.

Table 2. Sociodemographic and studying-related characteristics with respect to physical and mental health among medical students.

	PCS	*P*-value	MCS	*P*-value
Means age (years)		0.879[a]		0.599[a]
Age (years)		0.818[b]		0.570[b]
≤21	45.9 ± 5.4		42.2 ± 5.8	
>21	45.8 ± 5		41.9 ± 5.3	
Gender		0.346[b]		0.087[b]
Male	45.7 ± 4.7		42.5 ± 5.2	
Female	46.1 ± 5.5		41.7 ± 5.7	
Name of your university		0.91[c]		0.882[c]
Jordan University of Science and Technology	46.2 ± 4.8		42.1 ± 5	
University of Jordan	45.6 ± 5.1		42.3 ± 5.6	
Al Balqa Applied University	45.7 ± 5.1		42.1 ± 5.8	
Hashemite University	46 ± 5.8		42 ± 5.7	
Yarmouk University	46.2 ± 4.9		41.5 ± 5.5	
Mutah University	45.5 ± 5.2		41.1 ± 5.9	
Year of study		0.187[c]		0.589[c]
First year	43.7 ± 6.8		44.7 ± 6.3	
Second year	45.8 ± 5.3		42.3 ± 6.1	
Third year	45.4 ± 5.7		42.2 ± 5.3	
Fourth year	46.7 ± 5.1		41.7 ± 6.1	
Fifth year	46.3 ± 4.7		41.6 ± 5	
Sixth year	45.4 ± 5		42.3 ± 5.2	
GPA		0.779[c]		0.087[c]
Excellent	45.8 ± 4.9		42.6 ± 5	
Very good	45.8 ± 4.9		42.1 ± 5.4	
Good	46.4 ± 5.6		40.9 ± 6.3	
Fair	45.8 ± 7.6		39 ± 3.5	
I prefer not to say	44.8 ± 8.1		40.9 ± 7.5	
Do either of your parents work in the medical field?		0.74[b]		0.173[b]
Yes	45.7 ± 5.1		41.4 ± 5.5	
No	45.9 ± 5.2		42.2 ± 5.5	
Living condition		0.845[c]		0.770[c]
Living with parents	45.9 ± 5.2		42.3 ± 5.3	
Living alone	45.7 ± 5.4		41 ± 6.3	
Living with friends or colleagues	46.3 ± 4.7		41 ± 6	
Was medicine your first choice?		0.976[b]		0.476[b]
Yes	45.7 ± 5.2		42.3 ± 5.4	
No	46.7 ± 5		41 ± 6	

(continued)

Table 2. Continued.

	PCS	*P*-value	MCS	*P*-value
On average, how many hours do you study in a day?		0.887[b]		0.895[b]
≤5 h	45.9 ± 5.1		42.06 ± 5.5	
>5 h	45.9 ± 5.3		42 ± 5.5	
On average, how many hours do you sleep in a day?		0.963[b]		0.740
≤7 h	45.9 ± 5.1		42.1 ± 5.2	
>7 h	45.9 ± 5.2		41.9 ± 6	

PCS: physical component summary; MCS: mental component summary; GPA: grade point average.
aPearson correlation;
bt-Test;
cANOVA test

Results

Participants' characteristics

A total of 544 medical students participated in the study from all six medicine teaching universities in Jordan. There were 248 (45.6%) males and 296 (54.4%) females. The sixth-year medical students had the highest participation (162, 29.8%). Of this sample, 150 (27.6%) were in their preclinical academic years, while 394 (72.4%) were in their clinical academic year.

The mean age was 21.5 ± 1.63 years (range 17-29) and the median age was 22. Most of the participants belonged to the age category 18–24 years (531, 97.6%), with only 13 (2.4%) being above 24. The average participant studied for 4.4 ± 2.22 h per day and slept for 7 ± 1.36 h per day. Table 1 summarizes the sociodemographics of the participants.

Quality of life (physical and mental health scores of the Sf-12)

Overall, the mean (PCS) score was 45.9 ± 5.17, while the mean (MCS) score was 42.04 ± 5.52. Sixty-five (11.9%) of the sample rated their health in general as poor or fair. In total, 441 (81.1%) of medical students had a PCS score of less than 50, while 103 (18.9%) had an MCS score of less than 50. According to Table 2, there was no association between any of the sociodemographic variables and PCS or MCS scores.

At least some of the time, 402 of the medical students (73.9%) reported feeling down-hearted and depressed, and 401 of the medical students (73.7%) reported being limited in their work or other regular daily activities due to any emotional problems during the previous four weeks. In all, 351 medical students (64.5%) reported having physical or mental health difficulties that interfered with their social activities at least some of the time during the preceding 4 weeks.

Medical students' level of satisfaction with their career choice

In terms of career satisfaction, most participants (320, 58.8%) responded that they would study medicine again if they could redo their decision, and 203 (37.3%) would suggest it to others. However, 230 (42.3%) believed that their academic schedule did not leave enough time for personal or family life. Just over half of all respondents (307, 56.4%) either responded with definitely yes or probably with the statement that medicine is the ideal profession. Table 3 describes the PCS and MCS summary scores concerning several statements.

Medical students' career regret

The vast majority (76.3%) of participants regret their decision to study medicine. Concerning the main reasons for regret among medical students, the current study revealed that stress, lengthy time to become a physician, and frequent examinations were the most common reasons for regretting studying medicine (Figure 1). The lengthy time to become a physician to attain a medical doctorate was added as an option due to the long nature of time it takes to become a physician compared to other undergraduate degrees.

Upon analysis, there was a significant association between regrets of studying medicine and the year of study ($P = 0.017$). In our study, it was found to be 62.5% in the first year, 63.6% in the second year, 70.1% in the third year, 79.2% in the fourth, 73.8% in the fifth, and 80.4% in the sixth year. Additionally, participants who did not consider medicine as their first choice expressed a higher level of regret (91.2%), compared to those who did have medicine as their first choice (72.9%) ($P < 0.001$).

When asked about the intentions of dropping out of medical school, there was a statistical difference in the mean, whereas MCS was lower in the medical students who are always or frequently thinking about dropping out of medical school ($P < 0.001$). However, it was not the case with the PCS, where medical students who are always or frequently thinking about dropping out of medical school had a higher score ($P < 0.001$) (Table 4).

Discussion

In our study, a large percentage of students reported that they regret studying medicine to a certain degree, with career

Table 3. Medical students' perceptions toward their choice of medicine.

STATEMENT	DEFINITELY YES	PROBABLY	NEUTRAL	PROBABLY NOT	DEFINITELY NOT	PCS[a]	MCS[a]
Would you choose medicine again?	165 (30.3)	155 (28.5)	79 (14.5)	87 (16)	58 (10.7)	< 0.001	< 0.001
Would you recommend other to study medicine?	60 (11)	143 (26.3)	150 (27.6)	112 (20.6)	79 (14.5)	< 0.001	< 0.001
Study schedule leaves enough time for personal/family life	89 (16.4)	141 (25.9)	94 (17.3)	144 (26.5)	76 (14)	0.001	0.001
Medicine is the ideal career for me	150 (27.6)	157 (28.9)	112 (20.6)	66 (12.1)	59 (10.8)	< 0.001	< 0.001

PCS: physical component summary; MCS: mental component summary.
aANOVA test

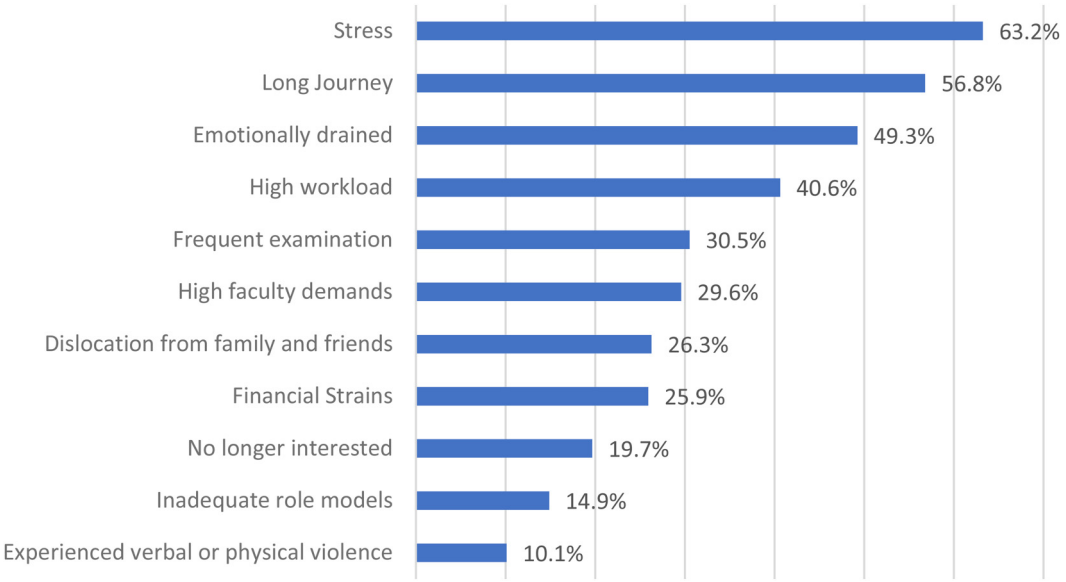

Figure 1. Medical students' reasons for regretting studying medicine (n = 415).

regret significantly increasing with year of study. Our findings also show a significant association between MCS scores and feelings of dropping out of medical school,

Many reasons were given for this regret, with the majority of students choosing stress as the main reason, followed by the long journey of medicine and their claim that medicine is emotionally draining. There are many reports of medical students being emotionally and psychologically drained, and when compared to the general population, medical students have been shown to have higher levels of stress.[24,25] In Jordan, a study conducted on medical students showed that over half of the students were found to have moderate to severe stress across all possible stressor domains, such as academic, social, drive and desire, and other stressors.[26] In addition, Jordanian students also reported academic overload, competition with peers, and worries about the future as stressors on their well-being.[27] Moreover, stress in medical students is associated with decreased empathy, increased burnout, and depression.[28–30] However, when considering the findings of our study, it is important to keep in mind that our study was conducted after the onset of the SARS-CoV-2 pandemic, which impacted the well-being of Jordanian medical students.[31]

In comparison to other countries, Jordanians have reported higher rates of career regret. In a study done in Kazakhstan, one-third of students regret studying medicine.[8] Similar to our study, there were no significant associations between any demographic factors and career regret. Furthermore, they reported that Kazakhstani medical students who had prior motivations to be physicians were less likely to regret studying medicine, which is similar to our finding that students who did not have medicine as their first choice had significantly higher regret than students who wanted to study medicine. Also, there was a significant association between the year of study and career regret, with each increasing year, the

Table 4. Medical students' intentions towards dropping out of medical school.

STATEMENT	PCS	*P*-value[a]	MCS	*P*-value[a]
Have you ever considered dropping out of the Medicine?		< 0.001		< 0.001
Never	45.2 ± 4.8		42.9 ± 4.8	
Seldom	46 ± 4.4		43.1 ± 4.8	
Sometimes	45.3 ± 5		42.2 ± 5.4	
Frequently	47.4 ± 6.8		38.8 ± 6.4	
Always	49.9 ± 5.2		37.2 ± 7.3	

PCS: physical component summary; MCS: mental component summary.
aANOVA test

percentage of students who regret studying medicine increased. In Kazakhstan, the percentage of students who regretted studying medicine was higher in between the students in their fourth to sixth year than during the first 3 preclinical years. This can likely be attributed to the more intense schedule in clinical years, along with the fact that as medical students go through each year, they are more likely to develop burnout, depression, and have a lower QoL.[21,32] One possible explanation for this increased regret in clinical years is the introduction of interactions with patients, which adds responsibility and can be challenging. Furthermore, the clinical years have also been reported to be more academically stressful than first-year students.[33] In contrast to these numbers in developing countries, the percentage of career regret in developed countries such as the USA is much lower, with a recent study showing that halfway through medical school 4% of students regret studying medicine, with this number increasing only to 7% by graduation.[34] Along the same line, career satisfaction and satisfaction with medical education are higher in developed countries, such as the USA[35] and the United Kingdom,[36] than in developing countries.[37–39] Moreover, few first-year medical students were included in our sample due to our focus on advanced students.

Previous studies on medical students have shown that medical students have poorer QoL when compared to the general population.[21,40] We used the SF-12 questionnaire to assess the QoL in our sample. To the best of our knowledge, there are no studies in Jordan assessing the QoL of the general population using the SF-12 tool. However, two studies have been done in Middle Eastern countries, on the general Iranian[41] and general Lebanese[42] populations. While no absolute comparisons can be made due to the variable factors between these populations and the Jordanian population, it is worth noting that both the average physical and mental health scores of Jordanian medical students are lower than the average in two countries in the same region, with one sharing historical and cultural ties. When looking at sociodemographic factors and their relation to QoL, there are no statistically significant relationships. There were no significant differences in QoL between universities, which could possibly be explained by the consistency of the curriculum across all six universities. While it has been reported that female medical students have poorer QoL than males, possibly as a result of experiencing more stress,[43] we did not find any differences between genders in our study. However, in our study, males had a higher MCS than females, a similar finding to other studies that studied psychological health using a different tool.[21,44–46] In contrast to other research, our results revealed that MCS reduced as GPA dropped. In a study done in Saudi Arabia, it was reported that those with higher GPAs had significantly lower psychological health scores, explaining that medical students with higher GPAs are under pressure to maintain their academic excellence.[44] However, another study on preclinical medical students reported higher psychological health scores with increasing GPA, relating the psychosocial factors that increase GPA such as increased spirituality, increased motivation, and self-esteem, to better overall psychological health.[46]

In our study, medical students who were often thinking about dropping out had lower MCS scores. This could be associated with increased burnout, with a study on medical students reporting that over some time, the QoL of medical students decreased and the percentage of students meeting the criteria for burnout increased.[21] Furthermore, low QoL has been associated with suicidal ideation and depressive symptoms in medical students.[43,47] In the USA, it was found that medical students with lower QoL scores, depressive symptoms, and burnout were more likely to have serious thoughts about dropping out of medical school.[48] These manifestations of psychological distress in medical students are concerning and could lead to the development of psychiatric illnesses, harmful coping mechanisms, and burnout as a physician. This is especially alarming in Jordan, with a recent study identifying that more than 80% of students are disengaged or exhausted, and over 90% of students were considered as cases of "minor" psychiatric illnesses according to the GHQ12 questionnaire.[27] This emphasizes the necessity of addressing Jordanian medical students' mental health, both for their safety and the safety of their future patients. This is particularly important because burnout may continue after graduating from medical school. In Jordanian residents, burnout was reported to reach 77%, with psychological distress being a significant predictor.[49]

The impact of the COVID-19 pandemic on the perspectives of medical students regarding their career choice and the emergence of regret is a significant factor that warrants attention. The findings of our research, carried out in 2021, have the potential to offer significant contributions to our understanding of this subject. A significant majority of medical students were found to exhibit low QoL ratings in our study. Specifically, 81.1% of participants had a PCS score below 50, while 18.9%

had a MCS score below 50. Moreover, a substantial proportion of participants (73.9%) indicated experiencing feelings of down-hearted and depression, whereas 73.7% expressed constraints in their day-to-day functioning as a result of emotional challenges. A significant proportion of the participants (76.3%) experienced feelings of regret in relation to their choice to pursue a career in medicine. Significantly, the primary factors contributing to feelings of regret were predominantly attributed to stress, accounting for 63.2% of the participants included.

Findings must be interpreted in light of the study's limitations. First, the retrospective and the cross-sectional study design introduced recall bias and hindered our ability to establish a causal correlation. So, a longitudinal study follow-up design is required to determine the course of career satisfaction and QoL among medical students and to show the true causal relationships between career regret and the beginning of deteriorating of QoL among medical students. Second, using an internet-based questionnaire might result in reporting bias due to under-or over-represented burned-out stress from discussing such sensitive topics, as direct interaction offers more trust and empathy. Third, there are numerous important aspects related to both career satisfaction and QoL that need further exploration, such as the presence of underlying psychiatric conditions, which were not reported in our study, and the relation between the studied factors and motives for studying medicine. QoL as a construct is difficult to simplify within a form such as the SF-12 due to the fact that other factors may not be taken into consideration. Lastly, our low response rate and accordingly small sample size are a limitation.

The strength of our study is that the data collection tool was vigorously reviewed by an expert and validated, and a validated SF-12 questionnaire was used to assess the QoL. In addition, this is the first study to evaluate students' regrets and attitudes toward their career choice for medical students in Jordan. Moreover, this study included students from all the medical teaching universities with different socioeconomic backgrounds all over Jordan. Therefore, we believe that our results represent the career regrets of medical students and QoL in Jordan with good precision; however, these results cannot be generalized, and future studies using a random sampling method and a large sample size would help in generalizing the results.

Implications for future research

A longitudinal study that can determine the presence of any causal links between career regret and QoL can provide further insights. Furthermore, conducting a qualitative study to identify themes associated with career regret and poor QoL may provide more comprehensive information to support the existing literature. A significant majority of the participants (76.3%) reported experiencing sentiments of regret in regard to their decision to pursue a career in medicine. Contradictory findings emerged from the survey, with 58.8% of respondents stating their readiness to pursue a career in medicine if given the opportunity to reconsider their earlier decision. Therefore, it is recommended for future research to utilize qualitative methodologies in order to gain a deeper understanding of the concealed curriculum's impact, the ramifications of external factors such as the pandemic, the complexities of students' experiences, the examination of implicit influences on medical education that may be undermining the initial enthusiasm of prospective medical physicians, and the influence of educators in shaping the perceptions and experiences of medical students. Lastly, more studies are needed to identify why Jordanians decide to study medicine, and if these motives are associated with career regrets and poor QoL.

Conclusion

The present study found a high prevalence of career regret and a low overall mean physical and mental QoL among medical students. Hence, these results may provide evidence for healthcare policymakers and medical school leadership to re-evaluate the factors associated with poor QoL from an institutional perspective. In addition, measures aimed to help students cope with stress healthily, such as student well-being programs, may be needed to reduce psychological distress among medical students.

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Authors' contributions

AK and MAA contributed to the conceptualization; MAA and SAA contributed to methodology; AK, MAA, and AA performed literature review; MAA and SAA contributed to validation; MAA contributed in formal analysis; AK, MAA, AA, NH, and FA contributed to investigation; AK, MAA, AA, QO, NH, and FA contributed to data curation; AK, MAA, AA, and NH involved in writing—original draft preparation; AK, MAA, AA, QO, NH, FA, and SAA involved in writing—review and editing; SAA in supervision; AK, MAA, and SAA involved in project administration. All authors made substantial contributions to conception and design and have read and agreed to the published version of the manuscript. All authors read and approved the final manuscript.

Disclosure of interests

The authors declare that they have no known competing financial or personal interests that could have influenced the work reported in this paper.

Data sharing

The data from the present research that were utilized and analyzed are accessible from the corresponding author upon request.

Ethics approval

This study was approved by The University of Jordan Research Ethics Board.

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Supplemental material

Supplemental material for this article is available online.

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