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STRENGTH OF MOTIVATION FOR MEDICAL SCHOOL-REVISED IN A SAMPLE OF IRAQI MEDICAL STUDENTS: SCORE PATTERNS AND PSYCHOMETRIC EVALUATION

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ABSTRACT

Objectives: Motivation is widely regarded as a critical determinant of learning outcomes, academic achievement, and overall well-being within the domain of medical education. Nevertheless, empirical investigations addressing this construct within the Iraqi context remain scarce, so this study design for mapping motivation patterns and evaluating the psychometric performance of the SMMS-R in a sample of Iraqi medical students.

Methods: This cross-sectional study aimed to determine the patterns of motivation and to evaluate the psychometric properties of the Strength of Motivation for Medical School-Revised (SMMS-R) questionnaire among 384 medical students of all six years of study at Hammurabi College of Medicine, University of Babylon. This was achieved by using scale of 15 items which were organized into 3 subscales each with 5 subitems, these conducted to the students by online survey by English & Arabic. & statistical analysis of the responses were achieved through SPSS v 31.

Results: Results of an anonymous online poll revealed that most students expressed moderate motivation levels (62.0%), followed by strong motivation (24.5%) and 13.5% with poor motivation. The highest scores were obtained on the Readiness to Start subscale (3.82 ± 0.91), followed by the Persistence (3.60 ± 0.61) and Willingness to Sacrifice (3.52 ± 0.76) subscales. Regarding the psychometric qualities, the overall 15-item SMMS-R demonstrated excellent total internal consistency ($\alpha = 0.862$) and internal consistency at the subscale level was assessed as satisfactory to good ($\alpha = 0.680-0.829$). Motivational strength was significantly different by gender ($t = -2.12$, $p = 0.036$) with female students scoring slightly higher than male students and by academic stage ($F = 2.50$, $p = 0.030$). However, the practical significance of both effects appeared to be modest.

Conclusion: Taken together, these results support the SMMS-R as a reliable and psychometrically robust instrument for use within Iraqi medical education. Also, the findings suggest that although students enter training with a strong sense of commitment, sustained socioeconomic and curricular pressures likely contribute to shaping their generally moderate motivation levels over time.

Keywords: Motivation; Medical Students; Iraq; SMMS-R; Psychometric Properties; Reliability

1 INTRODUCTION

Motivation is widely considered a key determinant of learning, academic success, and overall well-being for medical students. In the wider context of higher education, numerous studies have shown that motivation plays a crucial role in academic achievement, continued commitment to study programs, and psychosocial adaptation. Most importantly, a strong motivation is linked to autonomous, self-driven motivation while weaker ones negatively associated with external, non-self-determined forms of motivation. (1),(2),(3)

If we compare motivational landscape of medical students from that of students in other higher education disciplines, we found that Medical training is uniquely characterized by its early and sustained integrated with clinical practice providing minimal opportunity for the personalized academic routes typically found in standard university programs. Instead, of developing diverse and individualized profiles across different fields, medical students progress through rigid educational path focused on a specific, well-defined profession. This rigid path highlights the importance of understanding the quality and strength of motivation within this group, both from a theoretical and practical standpoint. (4,5)

A range of theoretical models has been proposed to explain human motivation, including Maslow's Hierarchy of Needs (6) the Need to Achieve Theory (7)), Atkinson's Expectancy-Value Theory. (8), Weiner's Attribution Theory(9), Bandura's Social Cognitive Theory. (10,11) Pintrich's Goal Theory. (12) and Deci and Ryan's Self-Determination Theory (SDT). (5) While most of these frameworks account for the *level* of motivation in an individual, SDT is distinctive in that it addresses motivation's *quality*. According to SDT, even when overall motivational level is high, the nature or type of motivation — whether autonomous or controlled — produces meaningfully different outcomes in learning, performance, and well-being. (4,13)

As of now, the Strength of Motivation for Medical School (SMMS) questionnaire is, to the authors' knowledge, the only tool specifically created to assess the level of motivation among students at the outset of medical training. Psychometric evaluation of the SMMS has yielded validity evidence for both the total scale and its three subscales.

Factor analysis confirmed a three-factor structure encompassing: (1) Willingness to Sacrifice, (2) Readiness to Start, and (3) Persistence. A revised version of this instrument — the SMMS-R — retains this three-factor configuration and comprises 15 items scored on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Of these items, eight are positively worded (indicative of motivation), while seven are negatively worded (counter-indicative of motivation). (14)

Research on student motivation within the Iraqi academic context remains limited. As far as the authors are aware, only one published study, has examined motivational determinants among Iraqi students, and evidence using the SMMS-R instrument specifically in this population is sparse. (15)

The present study was therefore designed to address this gap by mapping motivation patterns and evaluating the psychometric performance of the SMMS-R in a sample of Iraqi medical students.

2 METHODS

This cross-sectional study was conducted at Hammurabi College of Medicine, University of Babylon. Prior to the study, ethical approval was granted by the college's research ethics committee. The aims of the study were well explained to the students and there were no specific criteria for selecting participants. The survey was conducted online in English and Arabic and was open to students from all six academic years. The respondents' identities were kept confidential.

2.1 Metrics

The SMMS-R is a systematic instrument to assess the motivation of individuals who wish to study medicine. (3) The scale consists of 15 items, including five reverse (R) items, and is assessed on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). There are three subscales, each consisting of five items: Willingness to Sacrifice, Readiness to Start/Continue and Persistence.

2.2 Questionnaire Items: (14)

Willingness to Sacrifice Subscale

- Even if I could hardly maintain my social life, I would still continue medical training
- I would still choose medicine even if that meant I would never be able to go on holidays with my friends anymore.
- I would still choose medicine even if my family would not support my decision.
- I am prepared to accept a low income during my medical study period.
- I would still choose medicine even if I had to move to another city far away from my family.

2.3 Readiness to Start Subscale

- I wouldn't consider any other profession than becoming a doctor.
- I am prepared to start medical school right now.
- I have always wanted to study medicine.
- There is nothing that would stop me from starting medical school.
- Becoming a doctor is a lifelong dream of mine.

2.4 Persistence Subscale

- I would quit studying medicine if I were 95% certain that I could never become a specialist in the field of my choice.
- I would continue studying medicine even if I failed a lot of exams.
- Nothing can stop me from completing my medical studies.
- I will finish medical school no matter what.
- I would still continue medical training even if I lost interest halfway through.

The scores from the three subscales are added together to determine a Total Strength of Motivation score, with individual subscale scores ranging from 5 to 25, resulting in total scores that can vary from 15 to 75. These scores are classified into three categories:

- Low motivation: total scores from 15 to 45
- Moderate motivation: scores from 46 to 60
- High motivation: scores from 61 to 75

2.5 Data Analysis

The first part of the analysis was descriptive & analytical statistics of the data and SMMS -R data. So Chi square & ANOVA tests were used to conduct these statistics .

For assessment of reliability we used the classic Cronbach's alpha coefficients. Critical values for single measures were: $\alpha > .90$ = excellent, $\alpha > .80 < .90$ = good, $\alpha > .70 < .80$ = acceptable, $\alpha > .60 < .70$ = questionable, $\alpha > .50 < .60$ = poor, and $\alpha < .50$ = unacceptable.

We used SPSS version 31 for all our analyses.

3 RESULTS

This is cross-sectional study involving medical students conducted at Hammurabi college of medicine in March 2026, the total number of participants were 384, distributed as 30.2% male & 69.8% female. Students from all six years of study were participate with more than half from the 1st stage (52.1%). (table 1).

According to table.1, SMMS-R categories are distributed between the students in which most of them has moderate motivation (62%), while high motivation for medical study reported in (24.5%) and low motivation account for (13.5%) of all participants.

Table 1: Demographic characteristics and SMMS-R categories.

Variable		
Gender, n (%)		
Male	116 (30.2%)	
Female	268 (69.8%)	
Total	384	
Stage	n	%
1	200.000	52.100
2	44.000	11.500
3	36.000	9.400
4	40.000	10.400
5	46.000	12.000
6	18.000	4.700
Total	384	100%
Category of SMMS-R	Count	Percent
Moderate motivation	238	62.0%
High motivation	94	24.5%
Low motivation	52	13.5%
total	384	100%

3.1 Subscale & total score

In this study, we used three SMMS-R subscales (F1-F3) showed mean score in the moderate to high range , willingness to sacrifice score (F1) ranged from 1.40 to 5.00, with mean of (3.25), SD (0.76), and when we look to other subcategories readiness to start (F2) with mean of 3.82 and SD (0.910), while the mean for persistence subscale (F3) was (3.60) with SD of (0.610). total SMMS-R revealed mean of (3,65) & range of (1.270-4.870). (table .2)

Table 2: Descriptive Statistics for SMMS-R Total and Subscale Scores

Subscale	Items	Mean	SD	Median	Min	Max
F1 – Willingness to Sacrifice	Q1–Q5	3.520	0.760	3.600	1.400	5.000
F2 – Readiness to Start	Q6–Q10	3.820	0.910	4.000	1.400	5.000
F3 – Persistence	Q11–Q15	3.600	0.610	3.600	1.000	5.000
Total SMMS-R	Q1–Q15	3.650	0.620	3.730	1.270	4.870

3.2 Item -level patterns

Table 3 , the descriptive statistics for each item in each subscale & response distributions are summarized , we demonstrate that these 15 items show predominantly positive attitudes toward the continue medical training. In the descriptive analysis, most SMMS-R items demonstrated moderate to high endorsement, with item means exceeding 3.0 for 14 of the 15 statements. The highest mean was observed for Q15 (mean = 4.099, SD = 0.923), whereas Q11 had the lowest mean (mean = 2.339, SD = 1.055) and the greatest proportion of disagreement responses, indicating potential divergence from the overall response pattern.

When grouped by factor, the reediness to start (F2) showed the highest average item means, followed by Persistence (F3) and Willingness to Sacrifice (F1), supporting generally positive levels of motivation across the three SMMS-R

dimensions ,while also highlighting the atypical Q11 response pattern as nearly two-thirds of students selected strongly disagree or disagree, indicating low agreement relative to other persistence items. (Fig .1).

Table 3: Item-Level Descriptive Statistics and Response Distributions

Item	Scale	Mean	SD	SD%	D%	N%	A%	SA%
Q1	F1	3.573	1.009	4.200	9.400	28.100	41.700	16.700
Q2	F1	3.531	1.016	2.100	15.600	26.600	38.500	17.200
Q3	F1	3.427	1.145	4.700	21.400	18.200	38.000	17.700
Q4	F1	3.224	1.123	8.900	18.200	24.000	39.600	9.400
Q5	F1	3.854	1.124	5.700	8.300	12.000	42.700	31.200
Q6	F2	3.411	1.380	9.900	22.900	13.500	23.400	30.200
Q7	F2	4.005	0.956	3.100	5.200	10.900	49.500	31.200
Q8	F2	3.995	1.172	6.800	4.700	14.100	31.200	43.200
Q9	F2	4.036	1.003	3.600	5.200	10.900	44.300	35.900
Q10	F2	3.677	1.305	8.900	10.900	20.300	23.400	36.500
Q11	F3	2.339	1.055	19.300	47.400	18.800	9.400	5.200
Q12	F3	3.906	0.970	3.100	4.700	19.300	44.300	28.600
Q13	F3	3.802	0.938	2.100	6.200	24.500	43.800	23.400
Q14	F3	3.839	1.213	9.400	4.200	14.100	38.000	34.400
Q15	F3	4.099	0.923	3.600	2.100	9.900	49.500	34.900

SD%: strongly disagree, D%: disagree, N %: neutral, A%: agree. SA%: strongly agree.

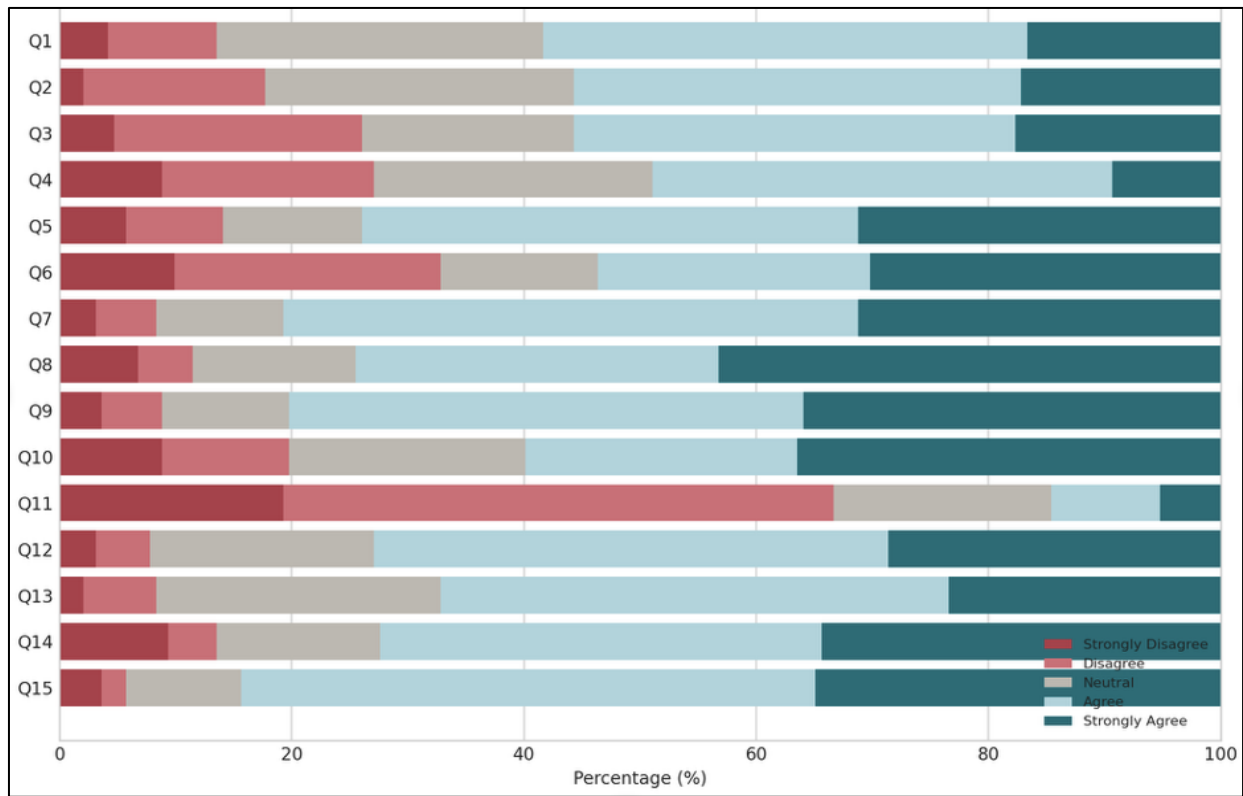


Figure 1: Likert Response Distribution for SMMS -R

3.3 Internal consistency reliability

For assessment of test internal consistency reliability, we depended on psychometric reliability coefficient, Cronbach alpha.

Based on commonly used thresholds ($\alpha \geq 0.70$ acceptable, ≥ 0.80 good), the Willingness to Sacrifice and Readiness to Start subscales, as well as the total SMMS-R score, demonstrated good reliability, while the Persistence subscale showed acceptable reliability.

Table 4: Internal Consistency Reliability Coefficient

Subscale	Items (k)	Cronbach_alpha	Interpretation
F1 – Willingness to Sacrifice	5	0.742	Good
F2 – Readiness to Start	5	0.829	Good
F3 – Persistence	5	0.680	Acceptable
Full SMMS-R (all items)	15	0.862	Good

3.4 Group differences by gender & stage

A statistically significant difference in SMMR was found between male and female students, with females showing a slightly higher mean score than males (test, $t = -2.12$, $p = 0.036$).

A statistically significant difference in SMMR was also found across academic stages (one-way ANOVA, $F = 2.50$, $p = 0.030$), although the magnitude of this difference was small. These findings indicate that gender and stage are associated with SMMR, but their practical impact appears limited. (table 5).

Table 5: Group and Stage Differences in SMMR Scores

Variable	Statistical test	Test statistic	P value	Significant
Gender	Independent-samples t-test	$t = -2.12$	0.036	Yes
Stage	One-way ANOVA	$F = 2.50$	0.030	Yes

3.5 Interrelation among SMMS-R subscales:

Examining Table 6, which illustrates the intercorrelations among the three subscales of SMMS_R and the overall SMMS_R score, it is evident that the subscales exhibit moderate positive correlations with each other ($r = 0.456$ – 0.559). This suggests that they evaluate related but distinct aspects of motivation in medical studies. Each subscale has a strong correlation with the total SMMS_R score ($r = 0.758$ – 0.854 , $p < 0.001$), indicating that Sacrifice, Readiness, and Persistence significantly enhance overall motivational strength. Readiness to start showed the strongest association with the total score ($r = 0.854$), followed by Willingness to Sacrifice ($r = 0.830$), while Persistence, although still significantly related, had a slightly lower correlation ($r = 0.758$).

Table 6: Intercorrelations of SMMS-R Subscales and Total SMMS_R Score.

	F1 (Sacrifice)	F2 (Readiness)	F3 (Persistence)	Total SMMS-R
F1 (Sacrifice)	—	0.559***	0.479***	0.830***
F2 (Readiness)	0.559***	—	0.456***	0.854***
F3 (Persistence)	0.479***	0.456***	—	0.758***
Total SMMS-R	0.830***	0.854***	0.758***	—

***: $p < 0.001$.

4 DISCUSSION

In this study we try to examine the motivational patterns and psychometric properties of the SMMS-R in a sample of 384 Iraqi medical students at Hammurabi College of Medicine, University of Babylon. Most participants fell within the

moderate motivation category (62%), while approximately one quarter demonstrated high motivation (24.5%), and a smaller proportion reported low motivation (13.5%). These findings are in general consistent with results reported in other Arab studies. Like A Tunisian cross-sectional study using the SMMS-R at the Faculty of Medicine of Sousse recorded a median total score of 55 (IQR 47–63), (16). which closely related to the moderate range seen in the present study. Also like these findings, the Iraqi study by Al-Hemiary et al. (2017), though applying a different motivational framework, found that humanitarian motivations and a sense of childhood aspiration on the top of the reasons for choosing medicine among first-year students at Baghdad College of Medicine, a pattern that is compatible with moderate-to-high intrinsic motivation profiles. (15)

We conclude from these that Iraqi medical students share same motivational characteristics with their regional peers, even when assessed by different instruments.

Examining the three subscales of the SMMS-R, *Readiness to Start* recorded the highest mean score ($M = 3.82$), followed by *Persistence* ($M = 3.60$) and *Willingness to Sacrifice* ($M = 3.52$). the ordering of these subscales similar to that observed in other studies like the original Dutch validation study by Nieuwhof et al. (2004), (4) and in the French adaption of Abbiati et al. (2019) which found that readiness-oriented items were among the greatest motivational drivers. (14)

The lower mean for Willingness to Sacrifice in this study may be a result of the socioeconomic problems faced by Iraqi medical students. The challenges of the long training period and the necessary personal sacrifices may be more difficult for them because of the difficult educational and social environment in post-war Iraq.

Conversely, the Palestinian cross-sectional study by Suboh MW et al. (2025) showed that more than 79% of their sample referred to the desire to positively impact patients' lives as a main motivator, (17) demonstrating that altruistic and humanitarian motivations remain strong throughout the Arab world despite encountering institutional or political challenges.

We noticed that about two-thirds of respondents in this study selecting 'strongly disagree' or 'disagree' for Q11 — a reverse-scored item belonging to the *Readiness to Start* subscale — which recorded the lowest mean of the entire scale ($M = 2.34$, $SD = 1.055$). Because this item is negatively worded, a lower mean actually indicates a higher level of readiness to continue medical training. This observation aligns with a known challenge in cross-cultural psychometric adaptation: the French SMMS-R validation by Abbiati et al. (2019), (14)

The psychometric performance of the SMMS-R in this sample was satisfactory. The overall Cronbach's alpha of 0.862 indicates good internal consistency for the full scale, a figure that compares favorably with the original Dutch validation ($\alpha = 0.79$), (4) the Kusurkar et al. (2011) evidence study ($\alpha = 0.70$ across subscales), (3) the German study by Faihs et al. (2023) ($\alpha = 0.785$), (16) and the US longitudinal study by Bansal and Pagidas (2025) ($\alpha = 0.79$). (18) . At the subscale level, both Willingness to Sacrifice ($\alpha = 0.742$) and Readiness to Start ($\alpha = 0.829$) demonstrated good to acceptable reliability, while Persistence ($\alpha = 0.680$) fell in the questionable-to-acceptable range. This similar to the findings of Abbiati et al. (2019), who likewise reported the Persistence subscale to be the weakest link in the scale's internal structure, (14) , explaining that a cross-cultural pattern that may revealed that measuring long-term perseverance through a brief five-item set is not reproducible all the time. Despite this limitation, our findings revealed accepted threshold of $\alpha \geq 0.60$ for all subscales and the total scale, confirming the SMMS-R as a psychometrically sound tool for use in the Iraqi medical education context.

Besides psychometric features of the SMMS-R, there was a significant gender gap in which female students obtained somewhat higher scores on the SMMS-R overall than male students ($t = -2.12$, $p = 0.036$). This finding is consistent with the findings of Kusurkar et al. (2010) who found that female medical students in the Netherlands scored higher than their male counterparts on the SMMS, (19) , Furthermore, Faihs et al. (2023) study in Munich reported significantly higher total SMMS-R and Readiness to Start scores for female students ($p < 0.05$ and $p < 0.001$ respectively) (16).

Furthermore, an Iraqi study by Al-Hemiary et al. (2017) found that 69.1% of the sample was female , a percentage quite like the current sample, where 69.8% of the sample was female . However, that research did not particularly investigate gender differences in the strength of motivation. (15) , The observed female advantage in motivation may be related to sociocultural aspects of Iraqi society, where a medical career is viewed as highly appreciated and encouraged for women, which may result in more ambition and readiness among females at an early stage.

The difference in motivating scores between academic stages was statistically significant ($F = 2.50$, $p = 0.030$) but the effect size was minor. Most importantly, the mean scores of the sample as a whole might have been influenced by the fact that more than half of the sample (52.1%) were first-year medical students, a period of medical training where motivation is at its peak, declining as students encounter escalating curricular obligations. Bansal and Pagidas (2025) reported a significant longitudinal fall in SMMS-R total scores throughout the first 2.5 years of training in a US group, with Willingness to Sacrifice and Persistence exhibiting the most marked declines. (18), A Mexican longitudinal analysis

encompassing all six undergraduate years revealed an inverted J-shaped motivational curve, peaking in pre-clinical years, declining sharply through clinical training years 3–4, and partially recovering in the final year.(20). Although the cross-sectional nature of the current study prevents causal inference, the stage-wise differences are compatible with this international pattern, warranting longitudinal follow-up studies within the Iraqi context.

The intercorrelations among the three SMMS-R subscales were moderate and positive ($r = 0.456\text{--}0.559$), indicating that while the three constructs — Sacrifice, Readiness, and Persistence — are distinct, they share a meaningful common motivational core. Each subscale demonstrated a strong relationship with the total SMMS-R score ($r = 0.758\text{--}0.854$), with Readiness to Start showing the highest association ($r = 0.854$), followed by Willingness to Sacrifice ($r = 0.830$), and Persistence ($r = 0.758$). from the theoretical point of view, this sequencing of subscales is coherent because the medical student at the point of entry into medical training the most important psychological drivers to begin their journey is readiness & commitments , where as long term persistence may be depending on accumulated experience and environmental support, Kusurkar et al. (2011) noted that each subscale contributed meaningfully to the overall motivational construct while retaining its distinct conceptual identity, (3). a conclusion that is substantially supported by the presented data.

These findings are due to specific peculiarities in medical education in Iraq. It is a structured 6 years MBChB curriculum in public universities which is very competitive and socially respected to get into. Students in Western systems generally explore several areas before finally choosing medicine. In contrast, in Iraq students usually decide to study medicine straight after finishing high school. This choice is conditioned by family and social considerations rather than being just based on personal interest.(15) . Self Determination Theory (SDT) by Deci and Ryan (5) which divides motivation into two types: intrinsic (self-driven) and extrinsic (externally influenced) can explain this circumstance. The motivation in this group is generally moderate and is likely to be a mixture of actual personal interest in medicine and external factors such as family and social expectations. However, the SMMS-R measures only how strong motivation is, not its type or quality, so it cannot fully reflect this distinction.

5 CONCLUSION

This study provides the first psychometric evaluation of the SMMS-R in an Iraqi medical student population, demonstrating that the instrument possesses good overall internal consistency ($\alpha = 0.862$) and acceptable to good reliability across its three subscales. Most Iraqi medical students at Hammurabi College of Medicine demonstrated moderate motivational strength for their medical studies, Gender and academic stage were both significantly associated with motivational strength, with female students and those in earlier training years demonstrating higher scores.

The overall level of motivation for the cohort is moderate, with particularly high ratings in the Readiness to Start subscale.

This implies that the students who enter the Hammurabi College of Medicine come with a strong intention to study medicine. But the long-term persistence and the willingness to sacrifice may be eroded as the stresses and demands of medical training increase.

Study limitations

- The study was performed in one institution (Hammurabi College of Medicine, University of Babylon), which would restrict the generalizability of the findings to other medical schools in Iraq.
- Furthermore, the cross-sectional design does not permit inferences about the change of motivation during the training period

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

Disclosure of conflict of interest

The authors declare no conflicts of interest regarding the publication of this manuscript.

Statement of ethical approval

The study received ethical approval from the Hammurabi College of Medicine Research Ethics Committee.

Statement of informed consent

All participants provided verbal informed consent.

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