Self-assessment skills of undergraduate students in operative dentistry: Preclinical performance and gender

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Abstract

Background. Self-assessment is key to improving the quality of work performed by dental professionals. The ability to accurately self-assess has been found to correlate with better clinical performance, making it an important skill for students to master during their dental education. Furthermore, studies conducted in dental schools across the world have shown that lower-performing students tend to overestimate their abilities compared to their peers.

Objectives. This study aimed to evaluate the self-assessment skills of dental students in pre-clinical operative dentistry and to investigate the impact of gender on these skills.

Material and methods. Third-year undergraduate dental students ($N = 335$) took 2 pre-clinical practical exams: class II composite preparation and restoration. Students self-assessed each assignment using a standardized rubric, and 6 calibrated faculty members graded all procedures blindly and independently. The difference between students' self-assessment scores (S) and mean faculty grades (F) reflected the students' self-assessment skills and was referred to as the Student-Faculty (S-F) gap. A positive S-F gap indicates that students overestimate their work, while a negative S-F gap indicates that students underestimate their work. Data was stratified by gender and by faculty-determined student performance, and then statistically analyzed.

Results. The study demonstrated a statistically significant difference between faculty grades and students' self-assessment scores. Positive S-F gaps were observed across all procedures, indicating overestimation, with a mean S-F gap of 11.4 ±9.9%. A negative correlation was found between faculty grades and S-F gaps. Higher-performing students showed smaller S-F gaps (4.8 ±5.3%) compared to lower-performing students (21.2 ±9.68%). Furthermore, male students showed significantly higher S-F gaps (14.0 ±10.3%) compared to females (9.7 ±9.4%).

Conclusions. Overestimation was more prevalent among lower-performing and male students compared to higher-performing and female students. Future investigations should consider exploring effective interventions and educational strategies aimed at improving students' self-awareness and their ability to accurately assess their performance.

Keywords: dental students, self-assessment, educational measurement, operative dentistry

Introduction

The ability to self-assess is crucial for engaging students in the active learning process and strengthening their sense of responsibility in achieving the desired learning outcome. This is of particular importance in dental school, where students need to learn specific clinical skills and work on improving their technical abilities. Notably, in the USA, the Commission on Dental Accreditation (CODA) places a high value on a student's ability to be responsible for their own learning by including self-assessments among the standards required in the dental predoctoral curriculum.[1] Interestingly, previous studies have demonstrated that lower-performing students tend to overestimate their abilities, whereas higher-performing students are better at accurate self-assessment.[2–5]

The adoption of self-assessment skills is needed in current dental education to encourage active learning instead of passive learning with a uni-directional flow of information from the faculty to the student.[6] This can lead to targeted learning and a personalized improvement plan, resulting in better pre-clinical performance. Self-assessment skills have been found to improve with clinical experience, as evidenced by fourth-year students' scores correlating much more closely with faculty scores compared to first-year students.[7] Additionally, the ability of a student to improve their self-assessment skills has been found to lead to improved performance.[8] Given the necessity of acquiring this skill and the benefits that it provides for predoctoral education, it is crucial that dental students spend sufficient time improving their ability to self-assess. The groundwork for these studies was laid by Kruger and Dunning in 1999. Their work demonstrated that low performers tend to have poor self-evaluation skills but also highlighted that improving skills in a particular domain enables better analysis of one's abilities.[9]

The coronavirus disease 2019 (COVID-19) pandemic increased the significance of student self-assessment due to the mandatory transition to virtual education.[10–13] Consequently, innovative approaches such as Blended Intensive Programs (BIPs) have emerged.[14] These programs integrate online learning with brief in-person instruction sessions.[15] The shift to distance education has underscored the significance of self-directed and self-assessed learning.[16]

Numerous studies have been conducted on dental student self-assessments, both in the USA[17–20] and globally.[21,22] One international study compared dental student self-assessment abilities in the USA and Japan.[22] Although different pre-clinical exercises were performed, the researchers found that both countries had lower-performing students overestimating their performance and higher-performing students underestimating their performance.[22] However, there was a larger range between lower- and higher-performing students in the USA, while Japanese dental students self-assessed themselves more similarly to their faculty graders.[22] One potential explanation for the differences between the 2 countries is the relative cultural homogeneity of students and faculty in Japan compared to those in the USA, who tend to come from a multitude of backgrounds.[22] In this study, most students at the Faculty of Dentistry of Ain-Shams University, Cairo, Egypt, are Egyptians, with a small percentage of international students. The faculty members, on the other hand, are all Egyptians and are all graduates of the same dental school.

Similar studies have been conducted in Syria,[23] Turkey[2] and Saudi Arabia.[24] They found discrepancies in the self-assessment abilities between lower- and higher-performing students. The studies suggest that more training and practice can improve self-assessment skills among dental students.[2,23,24] Additionally, a multicenter study in Germany found that student self-assessments serve as a useful indicator of deficiencies in required competencies among undergraduate dental students.[25]

To our knowledge, this is the first study evaluating dental students' self-assessment skills and performance in Egypt, with a large sample size of over 300 students from the same class and multiple (6) faculty graders.

The goal of this study was to evaluate dental students' self-assessment abilities in relation to their coursework in operative dentistry. The null hypothesis for this study posited that there would be no difference between the self-assigned scores and those given by faculty.

It is also important to evaluate the influence of gender on student self-assessment because performance pressure is a significant stressor for dental students, especially female students.[26,27] Previous studies have revealed that male students tend to overestimate their performance compared to female students in pre-clinical restorative coursework.[24,28] Studies evaluating self-assessment among medical students have found that females have lower confidence in their abilities and underestimate their performance more than their male counterparts.[29–31] This study is the first in Egypt to examine the impact of gender on self-assessment among predoctoral dental students. The null hypothesis was that there would be no difference in self-assessment abilities between male and female students.

Material and methods

The study was approved by the ethics committee of the Faculty of Dentistry of Ain-Shams University, Cairo, Egypt (IRB approval No. FDASU-Rec IR092206). The participants were third-year students enrolled in the five-year Bachelor of Dental Surgery program at the Faculty of Dentistry of Ain-Shams University. The students participated in the pre-clinical operative dentistry course for the academic year 2021–2022. Six full-time faculty members from the Department of Operative Dentistry, with 10–30 years of experience, taught the entire course and graded the students' performance.

As part of the course requirements, students completed pre-clinical formative assessments with guidance from the Department of Operative Dentistry. They performed various cavity preparations and restorations on acrylic typodonts, ranging from Class I to V. At the end of the course, students took final practical competency examinations without any guidance or assistance from the faculty. The students were evaluated on their performance in 2 specific pre-clinical procedures: Class II resin composite cavity preparation and restoration.

At the beginning of the course, the course director provided a review of the criteria rubrics to ensure that students had a clear understanding of the criteria for each procedure. The rubrics included a detailed itemization of the criteria for each required procedure. For instance, the cavity preparation outline was graded based on external outline extension, cavity depth, direction of each wall, and cutting in sweeping curves. The assessment scores for Class II cavity preparations ranged from 0 to 75 points, while scores for Class II resin composite restorations ranged from 0 to 60 points. During the formative exercises, students assessed their performance using the provided rubrics, which allowed them to become familiar with the criteria. During the final competency examination, students were instructed to self-assess their performance immediately after completing each procedure using the same rubric. After completing their self-assessment, the students submitted their typodonts along with the completed rubric forms. All typodonts were de-identified before faculty grading.

The 6 full-time faculty members at the Department of Operative Dentistry, Faculty of Dentistry, Ain-Shams University, who taught the third-year pre-clinical operative course, were calibrated by the course director throughout the course. These faculty members (KN, MN, DM, RS, MG, and KA) participated in grading the final competency examinations. The faculty calibration level was statistically evaluated after grading the students' performance. This evaluation process was completed before any further statistical analysis took place. The inter-rater reliability (IRR) among faculty members was analyzed using the intraclass correlation coefficient (ICC) (Microsoft Excel v.16.73; Microsoft Corporation, Redmond, USA).[32]

The faculty members independently assessed each procedure using the rubric employed by the students for their self-assessments. Both student self-assessment scores and faculty grades were converted into percentages to facilitate the comparison. The mean faculty grades were considered the actual student grades. The difference between the student and faculty scores (Student-Faculty (S-F) gap) was used as a measure of the students' self-assessment skills. The S-F gap was calculated separately for cavity preparation and restoration. The relationship between the students' performance and their self-assessment skills was analyzed using Student's t-tests and Pearson's correlation.

In addition, the data was stratified by student performance into quartiles. Student's t-test was used to compare the S-F gap within each quartile to the rest of the class. The data was also divided by gender to examine the impact of gender on a student's self-assessment skills. Within each gender group, the data was further stratified into quartiles based on the students' performance to evaluate the effect of gender on the self-assessment skills of lower- and higher-performing students.

Results

A total of 335 students participated in this study. Out of the 335 students, 205 students were female (61%) and 130 students were male (39%). Six calibrated faculty graders evaluated 335 student performances of both procedures blindly and independently. The calibration level among faculty graders was analyzed, and the results indicated excellent IRR with an absolute agreement of 0.94 and consistency of 0.94 for the procedures.

The students' performance was presented as the mean value of faculty grades. The mean faculty grades for cavity preparation, restoration and for both combined were 69.0 ±12.0%, 77.2 ±11.9% and 72.6 ±10.4%, respectively. The mean student self-assessment scores for cavity preparation, restoration and for both combined were 82.9 ±8.9%, 85.4 ±9.4% and 84.0 ±7.8%, respectively. Overall, the mean S-F gaps were found to be positive, indicating that students tended to overestimate their performance compared to the faculty graders. The mean S-F gaps for cavity preparation, restoration and for both combined were 13.9 ±11.9%, 8.2 ±11.1% and 11.4 ±9.9%, respectively. Mean faculty grades, self-assessment scores and S-F gaps are presented in Table 1.

The analysis of the faculty grades, stratified by quartile, revealed statistically significant differences in S-F gaps between lower- and higher-performing students. Specifically, when comparing the S-F gaps of the lower-performing students (students in the bottom quartile) with the rest of the class, significantly higher S-F gaps were observed for preparation (25.7 ±12.5% vs. 8.11

Table 1. Mean and standard deviation for faculty grades, students' self-assessment scores and S-F gaps for all procedures ($N = 335$)

Procedure	Faculty grade	Self-assessment score	S-F gap	Top quartile S-F gap	Bottom quartile S-F gap
Class II composite preparation	69.0 ±12.0	82.9 ±8.9	13.9 ±11.9	7.4 ±7.4	25.8 ±12.6
Class II composite restoration	77.2 ±11.9	85.4 ±9.4	8.2 ±11.1	0.82 ±7.1	19.7 ±11.3
Both procedures combined	72.6 ±10.4	84.0 ±7.8	11.4 ±9.9	4.8 ±5.3	21.2 ±9.7

±7.6%, *p* < 0.0001), restoration (19.7 ±11.3% vs. 4.38 ±8.1%, *p* < 0.0001) and both procedures combined (21.2 ±9.7% vs. 8.11 ±7.7%, *p* < 0.0001). In contrast, the S-F gaps of the higher-performing students (students in the top quartile) demonstrated significantly lower gaps compared to the rest of the class for preparation (7.4 ±7.4% vs. 20.1 ±12.0%, *p* < 0.0001), restoration (0.82 ±7.1% vs. 10.5 ±11.2%, *p* < 0.0001) and both procedures combined (4.8 ±5.3% vs. 13.5 ±10.2%, *p* < 0.0001, Table 2).

The study utilized linear regression analysis to evaluate the correlation between students' self-assessment skills and their performance. The scatter plot in Fig. 1 illustrates a negative correlation between the S-F gap (students' self-assessment skills) and faculty grades (students' performance). Pearson's correlation was used to further evaluate any correlations between the S-F gaps and students' performance (Prism 8.0.1; GraphPad Software, Boston, USA). The S-F gaps were found to be negatively and moderately correlated with faculty grades in both Class II composite preparation and restoration, as well as in both procedures combined. The correlation coefficients (r) were –0.725, –0.668 and –0.707, respectively, with all *p*-values less than 0.0001, indicating that students with higher S-F gaps tended to receive lower faculty grades. The correlation coefficients were also analyzed within different performance quartiles. Higher-performing students (top quartile) showed weak and negative correlation coefficients (r) between the S-F gap and faculty grade; these were –0.329, –0.2492 and –0.3737 for preparation, restoration and both procedures combined, respectively. These correlation coefficients were statistically significant (*p* < 0.0001). In comparison, lower-performing students (bottom quartile) showed stronger negative correlations (r) of –0.647, –0.353 and –0.6258 (all *p* < 0.0001) for preparation, restoration and both procedures combined, respectively.

Histograms in Fig. 2A and 2B show the distribution of S-F gaps in the top and bottom quartiles of student performances. This analysis defines underestimated self-
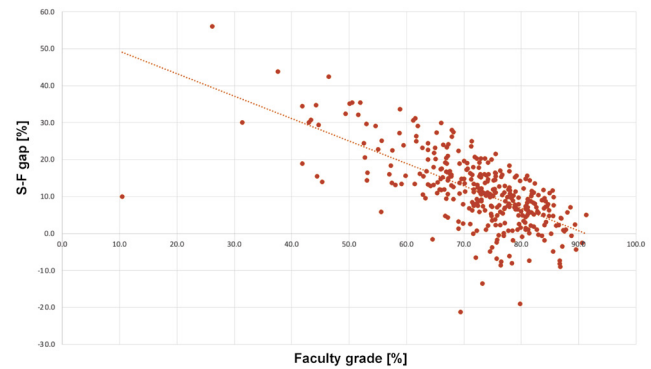

Fig. 1. Scatter plot showing the negative relationship between faculty grades and Student-Faculty (S-F) gaps ($N = 335$)

assessments as S-F gaps less than 0, accurate self-assessments as 0, and overestimated self-assessments as S-F gaps greater than 0. In the bottom quartile, while none of the students underestimated their performance and only 1.2% of students accurately self-assessed, the majority of students (98.8%) overestimated their performance. In the top quartile, 11.0% of students underestimated their performance and 9.7% of students self-assessed accurately. However, most students (79.3%) still overestimated their performance.

A comparative evaluation between female and male student performances and self-assessment skills also revealed some interesting findings. When compared by gender, female students demonstrated significantly higher performances compared to male students in preparation (70.7 ±10.4 vs. 66.3 ±13.8, *p* = 0.0009), restoration (80.1 ±9.1 vs. 72.7 ±14.2, *p* < 0.0001) and both procedures combined (74.9 ±8.2 vs. 69.1 ±12.4, *p* < 0.0001). On the other hand, male students showed significantly higher S-F gaps compared to female students in preparation (15.6 ±12.8 vs. 12.8 ±11.1, *p* = 0.0389), restoration (12.0 ±11.9 vs. 5.8 ±10.0, *p* < 0.0001) and both procedures combined (14.0 ±10.3 vs. 9.7 ±9.4, *p* = 0.0001) (Table 3).

Table 2. Mean and standard deviation for S-F gaps for all procedures stratified by quartile and compared to the rest of the class

Procedure	Top quartile vs. rest of the class			Bottom quartile vs. rest of the class		
	top (*n* = 82) [%]	rest (*n* = 253) [%]	*p*-value	bottom (*n* = 83) [%]	rest (*n* = 252) [%]	*p*-value
Class II composite preparation	7.4 ±7.4	20.1 ±12.0	<0.0001*	25.7 ±12.5	8.11 ±7.6	<0.0001*
Class II composite restoration	0.82 ±7.1	10.5 ±11.2	<0.0001*	19.7 ±11.3	4.38 ±8.1	<0.0001*
Both procedures combined	4.8 ±5.3	13.5 ±10.2	<0.0001*	21.2 ±9.7	8.11 ±7.7	<0.0001*

*statistically significant (*p* < 0.05).

Table 3. Mean and standard deviation for the faculty grades, students' self-assessment scores and S-F gaps for all procedures stratified by gender

Procedure	Faculty grade [%]			Self-assessment score [%]			S-F gap [%]		
	M	F	*p*-value	M	F	*p*-value	M	F	*p*-value
Class II composite preparation	66.3 ±13.8	70.7 ±10.4	0.0009*	81.9 ±8.2	83.6 ±9.2	0.0846	15.6 ±12.8	12.8 ±11.1	0.0389*
Class II composite restoration	72.7 ±14.2	80.1 ±9.1	<0.0001*	84.7 ±10.2	85.8 ±8.8	0.2647	12.0 ±11.9	5.8 ±10.0	<0.0001*
Both procedures combined	69.1 ±12.4	74.9 ±8.2	<0.0001*	83.1 ±7.5	84.6 ±7.9	0.0925	14.0 ±10.3	9.7 ±9.4	0.0001*

*statistically significant (*p* < 0.05). Males (M): *n* = 130; Females (F): *n* = 205.

Figures 2C and 2D present histograms that visually represent the distribution of S-F gaps for female and male students. In the analysis of male students, the majority of them (90.7%) overestimated their performance. Only 1.5% of male students underestimated their performance and 8.5% of male students accurately self-assessed their performance. In contrast, among female students, 7.8% of them underestimated their performance and 13.2% accurately self-assessed. The majority of female students (79.0%) overestimated their work.

Within each gender group, the data was further stratified into quartiles based on students' performance. Table 4 provides further insights into the impact of gender within quartiles. Female students, both in the top and bottom quartiles, had higher mean faculty grades compared to male students. These findings indicate that female students, regardless of their performance level, performed better than their male counterparts. In terms of self-assessment, both female and male students in the top quartile demonstrated similar S-F gaps, with no statistically significant difference between the genders (6.0 ±5.0 for males vs. 4.1 ±5.8 for females, p = 0.1437). However, in the bottom quartile, there was a statistically significant difference in S-F gaps between female and male students. Lower-performing male students tended to overestimate their performance more than lower-performing female students (26.1 ±10.5 for males vs. 17.6 ±9.6 for females, p = 0.0004).
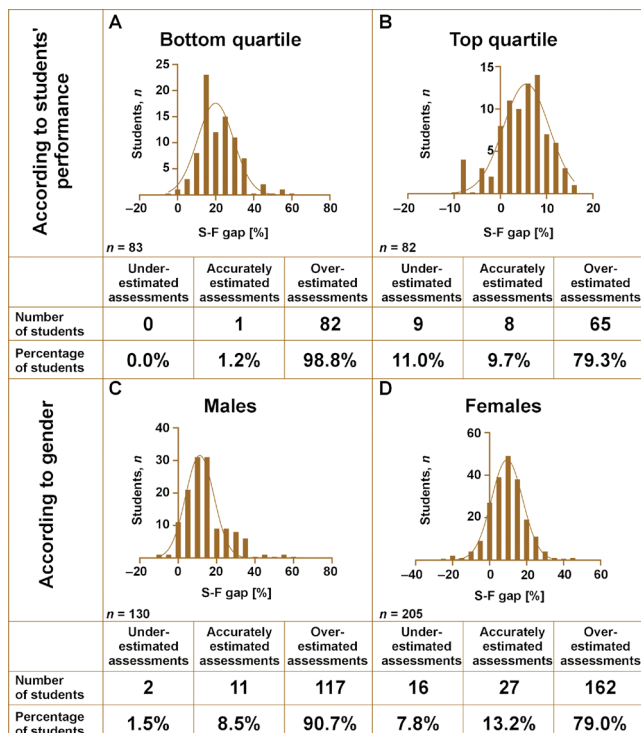

Fig. 2. Histograms showing the distribution of the S-F gap compared to the normal distribution

A. Bottom quartile students; B. Top quartile students; C. Male students; D. Female students. Underestimated self-assessments are defined as S-F gaps <0, accurate self-assessments are equal to 0 and overestimated self-assessments are defined as S-F gaps >0.

Table 4. Mean and standard deviation for faculty grades, students' self-assessment scores and S-F gaps for all procedures stratified by gender and quartile

Procedure	Top quartile faculty grade [%]			Bottom quartile faculty grade [%]			Top quartile self-assessment score [%]			Bottom quartile self-assessment score [%]			Top quartile S-F gap [%]			Bottom quartile S-F gap [%]		
	M	F	*p*-value	M	F	*p*-value	M	F	*p*-value	M	F	*p*-value	M	F	*p*-value	M	F	*p*-value
Class II composite preparation	80.9 ±3.9	82.8 ±3.1	0.0182*	47.5 ±11.0	56.9 ±7.6	<0.0001*	87.2 ±4.9	88.1 ±5.8	0.4390	77.3 ±8.7	79.5 ±10.8	0.3343	6.3 ±5.7	5.4 ±6.4	0.5288	29.9 ±13.3	22.6 ±11.7	0.0098*
Class II composite restoration	87.0 ±3.2	89.4 ±1.9	<0.0001*	52.2 ±11.7	64.8 ±7.0	<0.0001*	90.1 ±5.6	89.6 ±7.1	0.7444	76.5 ±14.4	81.7 ±11.4	0.1021	3.1 ±6.0	0.2 ±7.3	0.0678	24.3 ±3.1	16.9 ±9.1	0.0074*
Both procedures combined	81.7 ±3.6	84.4 ±2.6	0.0001*	50.8 ±9.3	64.0 ±5.2	<0.0001*	87.6 ±5.2	88.5 ±5.4	0.4423	76.9 ±9.0	81.6 ±8.8	0.0210*	6.0 ±5.0	4.1 ±5.8	0.1437	26.1 ±10.5	17.6 ±9.6	0.0004*

*statistically significant ($p < 0.05$).

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Discussion

Our study showed that students tended to overestimate their performance, as evidenced by a positive mean S-F gap across all performed procedures. Linear regression and Pearson's correlation analyses revealed a negative correlation between S-F gaps and student performances, indicating that higher-performing students had lower S-F gaps, which suggests better self-assessment skills. This trend was more pronounced when the data was stratified by student performance into quartiles. Lower-performing students showed a more than 4-fold higher S-F gap than their peers, while higher-performing students demonstrated a much smaller S-F gap. Moreover, higher-performing students generally demonstrated a weaker correlation, suggesting a relatively superior ability to self-assess, whereas lower-performing students showed a stronger correlation, indicating a greater discrepancy between their self-assessment and their actual performance.

The histograms compare the distribution of the self-assessment tendencies between lower- and higher-performing students. Lower-performing students were more prone to overestimate their work, while higher-performing students showed a higher proportion of accurate self-assessments. It is noteworthy that none of the students in the bottom quartile underestimated their performance, and only 1 student accurately assessed themselves. This finding indicates that students may lack self-awareness or have difficulty recognizing areas where they need to improve their performance.

Thus, we rejected our null hypothesis that there was no difference between students' self-assessment and the grades they received from faculty. Our findings are in accordance with previous research that has also found that lower-performing students overestimate their skills compared to higher-performing individuals.[2–5] The findings from the first part of our study indicate that the pre-clinical performance of undergraduate students is influenced by their self-assessment skills. This suggests that students' self-assessment may potentially serve as an early predictor of performance during dental training.

Our study also found that students demonstrated better self-assessment abilities for restoration assignments compared to cavity preparation, as evidenced by a smaller S-F gap. This is consistent with previous studies indicating that more complex procedures, such as composite cavity preparation, may require greater knowledge and technical skills. Therefore, the students' ability to accurately evaluate their performance decrease as they are less confident of their skills.[21,28,33]

Furthermore, we examined the impact of gender on self-assessment among undergraduate students. In our study, male students were found to significantly overestimate their performance compared to their female peers, despite the fact that female students received significantly higher faculty grades. Therefore, we rejected the null hypothesis that there is no difference between male and female students in terms of self-assessment.

Interestingly, when we further analyzed the data by stratifying student performances into quartiles within each gender group, we observed that gender did not affect the self-assessment ability of higher-performing students. Students in the top quartile of both genders more accurately assessed their performances, suggesting that higher-performing students possess stronger self-assessment skills regardless of gender. However, there was a significant difference in self-assessment skills between lower-performing male and female students, with females demonstrating better assessment and performance abilities. Previous research has also found that gender differences are more pronounced among lower-performing students.[28]

The distribution patterns presented in the histograms provide support for the gender-based differences among dental students. The histograms showed that male students tend to overestimate their performance, while female students tend to either evaluate themselves accurately or underestimate their work.

Our study showed significant gender-based differences in both performance and self-assessment skills. This is consistent with previous research, which has discovered similar results concerning gender differences.[24,28] Previous studies have suggested that female students may have been taught to be more humble and modest.[29] In fact, female students have been observed to underestimate themselves despite similar performances in both low- and high-stake environments among medical and dental students, indicating the presence of systemic factors within the educational culture.[31,34] Moreover, previous studies showed that female students experience greater stress related to their confidence in becoming successful students and the difficulty in learning precision of manual skills required for pre-clinical and laboratory work.[35,36] Additionally, they tend to experience more stress related to examinations and grades.[26] To address these stressors, it is recommended that students be taught self-assessment skills to enhance their self-directed learning process and, ultimately, their performance.[20]

It is important to understand the significance of gender as an influencing factor in student performance within healthcare education. The findings from the second part of our study, which evaluated the role of gender in student self-assessment, provide valuable insights into dental education not only in Egypt, but also on a global scale.

Since students tend to overestimate their performance consistently, it is likely that this is due to their overconfidence. It has also been suggested that students may overestimate their abilities by relying on past per-

formances rather than their current work.[2] Lower-performing students may overestimate their abilities due to worse comprehension of the parameters of the assignment, leading to inaccurate self-assessments. It has been argued that lower performers likely display deficits in metacognitive skills, which results in their inflated self-assessment.[9] Kruger and Dunning suggested that both poor performance and an inability to recognize poor performance stem from overall incompetence.[9] Importantly, confidence may also contribute to this issue, as these students may struggle more with being perceived as lower-achieving and therefore overcompensate with their self-assessment scores. Our study examined the initial exposure to pre-clinical exercises for third-year students in the operative dentistry course. Previous studies have found that self-assessment is a skill that develops over time and can be influenced by the stage of a student's education during which it is evaluated.[8,30]

Our study highlights the importance of improving student self-assessment skills. This can be achieved by emphasizing the significance of self-assessment to students and fostering a shared understanding of necessary competencies between students and faculty. Students should be encouraged to reflect on their performance before receiving faculty feedback to emphasize the significance of developing critical judgment skills in their own work. Peer learning has also been found to be very effective at strengthening self-assessment skills and should be implemented.[24,33] Moreover, our findings support the importance of a more balanced education from an early age to reduce gender differences in confidence and self-awareness. Further exploration of factors that influence students' self-assessment, including gender, will play an important role in creating a more equitable and inclusive educational environment.

Providing appropriate training to faculty members is essential to ensure consistent and reliable teaching and grading of student performance. The study demonstrated an excellent IRR of our faculty grading, with an absolute agreement of 0.94 and consistency of 0.94 for all procedures, indicating that the faculty graders were well-calibrated and in agreement. This enhances the accuracy and consistency of the grading process. Evaluating the calibration levels of participating faculty members should be considered a valuable measure to maintain the quality of assessment and education.

Although our study had a large sample size, it was conducted on a single class at a single institution, which limits the generalizability of our findings. Future studies should examine multiple classes across various disciplines and educational centers to draw broader conclusions. It would also be beneficial to assess students' progress throughout the academic year. Despite its limitations, this study is a valuable contribution to global dental education research as it evaluates students' self-assessment skills and identifies influencing factors.

Conclusions

Accurately assessing clinical performance is crucial for dental students as they will mostly work as solo practitioners in their future clinical practice. The study findings indicate that most students tend to overestimate their performance, with higher-performing students demonstrating significantly more accurate self-assessments than lower-performing students. Furthermore, male students had lower performance yet significantly overestimated their work compared to their female peers. This study provides valuable insight into the self-assessment skills of undergraduate students and should lead to further investigation into effective interventions and educational strategies aimed at enhancing students' self-awareness and their ability to accurately assess their performance.

Ethics approval and consent to participate

The study was approved by the ethics committee of the Faculty of Dentistry of Ain Shams University, Cairo, Egypt (IRB approval No. FDASU-Rec IR092206).

Data availability

The datasets supporting the findings of the current study are available from the corresponding author on reasonable request.

Consent for publication

Not applicable.

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