



Investigating the Knowledge of General Dental Students and Residents Regarding Practical Self-Assessment Skills

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Abstract

Background: Self-assessment (SA) means assessing or judging efficiency, and identifying strengths and weaknesses to improve learning outcomes.

Objectives: The present study aims to investigate the knowledge, and attitude of the students of Kerman Dental Faculty regarding practical self-assessment skills.

Methods: This cross-sectional descriptive-analytic study included 220 residents, and general students of Kerman Faculty of Dentistry. Data was collected using a questionnaire consisting of two parts. In the first part, the demographic information was recorded. The second part questioned students' knowledge and attitude toward practical self-assessment skills. The intra-class coefficient and content validity index of the questionnaire were 0.72 and 0.83, respectively. Data were analyzed using a T-test, analysis of variance, and multivariate regression in SPSS 21 software. P-value<0.05 was considered as the statistical significance level.

Results: The results indicated that the average score of questionnaire was 44.45 ± 6.58 for women and 42.60 ± 5 for men, which was significantly higher in the female students (P-value=0.02). Moreover, the average score of residents was 46.4 ± 6.21 , considerably higher than general students (42.99 ± 5.80) (P value = 0.01). Finally, the average score of students at public colleges was equal to 44.48 ± 6.10 , higher than that to those studying at private colleges (41.56 ± 5.35) (P-value = 0.01), which shows better self-assessment skills.

Conclusion: The study highlights the critical role of self-assessment skills to improve the dental students learning ability, performance, and independency. Moreover, it is recommended that regular self-assessment skills be considered significantly in dentistry curricula.

Keywords: Self-Assessment Skills, Practical Self-Assessment, Dental Students

Background

Factors affecting learning are classified into two areas: personal and environmental. Individual factors include learners' behaviors, flexibility, self-assessment, willingness to learn, and motivation. On the other hand, the environmental factors include the environment, and physical resources, concentration on the result of education, achievement of teaching and assessment

goals, promoting learning via student-student interaction, valuing students' opinions, encouraging students to provide feedback on the teaching method, professors' support, and student participation (1). Nowadays, most universities are looking at educational ways to strengthen clinical decision-making abilities and ongoing self-centered learning; nonetheless, teaching in Iran often includes transferring knowledge from the

professor's head to the student (2). Assessment is one of the essential parts of education process at any level, classified into three groups: Formative, Diagnostic, and Summative (3). In formative assessment, assessments run during learning while professors' teaching students' learning is still ongoing. In the diagnostic assessment, it is tried those appropriate problem-removing methods be taught to professors in addition to identifying students' learning problems. In the summative assessment, students' learning during a specified course is determined, aiming to score students, and judge the professor's teaching and curriculum (3).

At the beginning or conclusion of the course, the professor or another person might conduct the skill evaluation. The assessment method should be reliable, flexible, comprehensive, easy, relevant, and quick. One of the assessment methods is student self-assessment (4). Self-assessment (SA) means evaluating or judging efficiency, and recognizing one's strengths and weaknesses to improve learning outcomes (5). Since the primary goal of education is to create long-term and non-dependent learning, SA helps students move towards the reflective practice (6). SA skill is essential to ensure effective learning and should be taught to students which may not be innate, but it is an acquired skill. SA and other clinical skills must develop simultaneously. Studies showed that student self-assessment of practical skills is more valuable than common university assessments, including written and practical exams; therefore, in addition to the professor's judgment, student self-assessment is performed in many universities (2).

Many studies showed that learners can accurately judge their performance and support the reliability, and benefits of SA for formative objectives (7). Traditional self-assessment methods are not effective in changing professor-based to student-based approaches. A student-centered approach primarily emphasizes the actions and efforts made by students in the learning process, rather than those of teachers (8). The primary purpose of higher education is to improve independence, and life-long learning, both of which help the students to become "reflection practice" students who can criticize their professional performance (9). Reviewing students' views on gaining clinical skills can be named one of the activities that can facilitate learning in the clinical environment (10). As training methods and tools are constantly developing, it is imperative that assessment methods adapt accordingly. In general, students do not accurately self-

assess because they tend to assess the actual success potentials and levels instead (11). Researchers showed that students with high success usually underestimate themselves, while less successful students overestimate themselves (12-15).

Many international studies addressed student self-assessment in pharmacy education (16-20), medical education (21-25), and dental education (26-29). Dentistry is a self-analytical profession, and dentists should be able to assess each procedure properly.

Research conducted on students specializing in pediatric dentistry has shown that the majority of students need practical instruction, while only one-third feel adequately equipped to engage in patient care (30-32). Moreover, factors like previous experiences and lacking suitable facilities influence this attitude. In general, results show a need for more efforts to improve clinical teaching in pediatric dentistry. Furthermore, researches show that using appropriate assessment tools and necessary instructions for faculty members can improve the learning process of dental students (33-35).

Self-assessment is a critical skill that dentists should possess as oral health care providers (28). Self-assessment is defined by İncesu et al. (21), and Guo et al. (36) as a process in which students assess the quality of their thinking and behavior while learning, and identifying strategies to improve their understanding skills. This concept is approved in the studies of Zarei Hajiabadi et al., Sáinz et al. and Li et al. (37-39) Habib et al. (27) showed that self-assessment is a valuable learning technique in dentistry because it improves performance at every step. Accurate self-assessment enables self-reflection on one's strengths, and weaknesses which is one of the essential features of self-directed learning. However, the role of student self-assessments is still very controversial despite some efforts to clarify this aspect of learning compared to professors' assessments (12, 14, 19, 30).

Objectives

Considering the importance of self-assessment skills, and their effect on student's learning, the present study aimed to evaluate the perceived SA skills of general students and residents of Kerman Faculty of Dentistry.

Methods

The present cross-sectional descriptive-analytical study was conducted on 220 dental residents, and third to sixth-year general students of the dentistry faculty of Kerman University of Medical Sciences selected by

census sampling method in 2020-2021. Initially, a comprehensive roster was compiled for both third to sixth-year general dental students and residents, which were obtained independently from the vice chancellor for education office of the dentistry faculty. The total number of students was 220 (137 general and 83 residents), all them were included in the study except the ones with no tendency for participation.

The data collection tool included a questionnaire consisting of two parts. The first part contains questions on gender, age, level of education, academic year, and type of admission (public or private colleges). The second part consists of 14 questions on perceived self-assessment skills. These questions were taken from the study by Abdullah et al. (11).

To assess the validity, the questionnaire was given to ten pediatricians and oral and dental disease specialists, and a content validity index (CVI) of 0.83 was obtained, which was acceptable, and their comments were applied to the questionnaire. To assess the reliability, the questionnaire was distributed and then collected among 20 students. Two weeks later, the same students completed the questionnaire again, and the intra-class coefficient (ICC) was calculated at 0.72, as well as Cronbach's alpha 0.68. The questionnaire was scored based on a five-point Likert scale as follows: totally agree=4, I agree =3, I have no opinion = 2, I disagree = 1, Totally disagree = 0. Furthermore, the score of the answers in the questions with the opposite direction (questions 8, 9, and 14) is as follows: Totally agree = 0, I agree = 1, I have no opinion = 2, I disagree = 3, and I Totally disagree = 4. The possible score range is 0 to 56, which indicates the lowest and the highest level of student-perceived self-evaluation skills. Regarding the response rate of 100%, to categorize the questionnaire scores, students' self-assessment skills were divided into three levels: low (0-18), moderate (19-37), and high (38-56).

Data analysis was done using a t-test, analysis of variance, and multivariate linear regression analysis in SPSS Ver. 21. P-value<0.05 was considered as the statistical significance level. Kerman University has approved this study of Medical Sciences with the code of ethics IR.KMU.REC.1398.712.

Results

A total of 220 students and residents of Kerman Faculty of Dentistry participated in the present study. The mean \pm SD of participants' age was 24.38 ± 2.68 . The demographic characteristics of the study population in

demonstrated in table 1. The lowest and the highest scores obtained were 30 and 56, respectively (mean \pm SD = 43.69 ± 6.03), which is at an acceptable level. The mean score obtained by general dental students was 42.99 ± 5.80 , and the mean score residents was 46.4 ± 6.21 , respectively (Table 2).

Table 1. Frequency distribution of the participants according to demographic characteristics

Demographic characteristics	Frequency (%)	
Gender	Female	129(58.6)
	Male	91(41.4)
Study level	General dentistry	175(79.5)
	Dental residency	45(20.5)
Academic year	Third	37(21.1)
	Fourth	36(20.7)
	Fifth	51(29.1)
	Sixth	51(29.1)
Type of admission	Public	160(72.7)
	Private	60(27.3)

Students' SA scores were classified into three low (0-18), medium (19-37), and high (38-56) groups, which are shown in figure 1 in the form of percentages (be noted that there is no score in the low group). Based on figure 1, most students (84.1%) obtained high scores in SA skills.

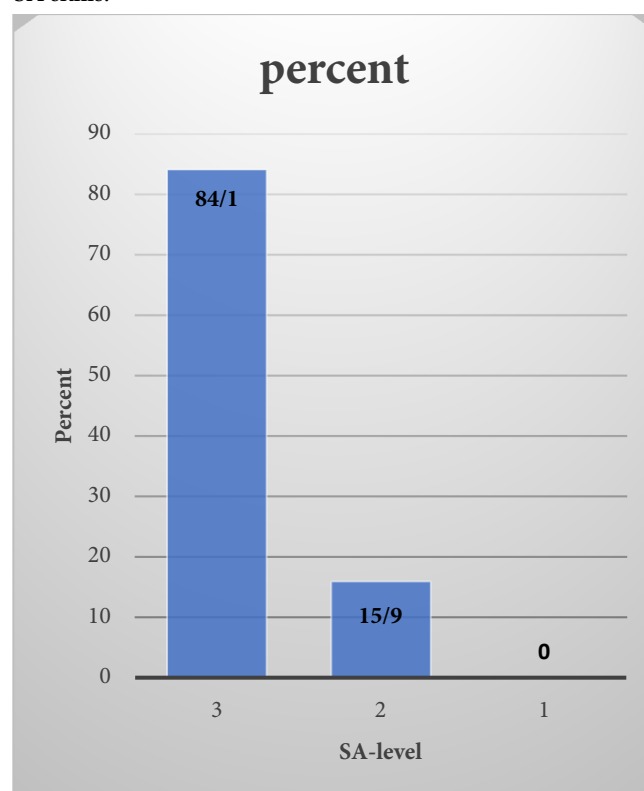


Figure 1: Student-perceived self-assessment

Table 2. Comparison of questionnaire scores by demographic information

Demographic characteristics	Number	Mean (SD)	P-value
Gender	Female	91	42.60 (5.00)
	Male	129	44.45 (6.58)
Study level	General dentistry	175	42.99 (5.80)
	Dental residency	45	46.40 (6.21)
Type of admission	Third	160	44.48 (6.10)
	Private	60	41.56 (5.35)

Table 2 shows the results of T-test regarding average questionnaire scores based on gender, educational level, and type of admission. Based on the findings, female students demonstrated superior performance in terms of their understanding of self-assessment abilities compared to their male counterparts ($P=0.02$). Thus, the residents showed higher knowledge compared to general students in this regard, which is statistically significant ($P=0.01$). Hence, table 2 shows that students which were admitted in the form of public, have higher self-assessment skills compared to the ones with private type of admission in the university ($P=0.01$).

Regression analysis showed that female students, residents, and public college students scored significantly higher, which confirms the results of table 2 which was done by T-test. In other words, the regression analysis shows that the probability of the presence of higher self-assessment skills in students increases with age, higher level of education, and also difficulty in university acceptance (Table 3). Also, table 3 suggests that increasing the level of academic year in general dental students did not affect the perceived self-assessment skills in any way.

Table 3. The relationship between SA knowledge and study variables according to multiple regression analysis

Model	B	SE	T	P-value
(Constant)	49.024	4.145	11.828	0.000
Sex	1.726	0.811	2.128	0.034
Age*	-0.436	0.199	-2.190	0.030
Grade	4.306	1.412	3.049	0.003
Academic year	-0.176	0.505	-0.348	0.728
Type of admission	-1.784	0.966	-1.846	0.066

SE: Standard error

Dependent Variable: SA.

Sex: male, female. Grade: general dental student, resident. Academic year: third year, fourth year, fifth year, sixth year. Type of admission: public, private. *reference level is 20 and over.

Discussion

The findings of the current research indicate that the mean self-assessment skill score of the students was deemed satisfactory, aligning with the findings of Abdullah et al. and Munoz et al., who indicated favorable views among students (11, 40). Siow et al.

studied the perceived SA of nutrition students using a questionnaire, and suggested that most of the participants agreed that SA makes them independent; however, only half of the participants stated that SA helps them learn independently. This discrepancy may be because there is a greater need for dental professor training than nutrition science (6).

Siow et al. reported that 52% of students believed that SA benefits them, and only 13% disagreed with this idea (6). However, 85.9% of students in the present study agreed, and 7.7% disagreed.

Gholami Salehabadi et al. stated that most students were satisfied with self-assessment and believed that concentration, and thinking were effective in learning. According to the source, self-assessment has been shown to have a favorable impact on students' performance in reading comprehension examinations, long-term education, and understanding of relevant methods (41). The students stated that self-assessment improves their performance, which is consistent with Salehabadi's study.

In a systematic review by Mays et al., limited information was found about any systematic student self-assessment training. They found that the effect of self-assessment on students' performance needed to be clarified in most of the studies. Mays showed a need to pay more attention to regular self-assessment training in the oral health curriculum (42).

Wiley et al. found that more than 69% of the participants believed that self-assessment and peer assessment improve their learning ability, consistent with the present study (43). McDonald et al., concluded that SA training could positively affect students' performance, and students of the current study had a favorable view in this regard (44).

The current study showed that female students achieved superior scores compared to male students, in line with the findings of Wiener et al. (26), which indicated that the self-assessment scores of female students were higher than those of male students. The result of present study was consistent with the results of studies that analyzed the self-assessment skills of

American dental and medical students by gender (25, 26). This result was consistent with another study that analyzed European non-medical students (45). The findings of this study and their consistency with other studies indicate that despite different educational systems, and curricula in different parts of the world, gender differences cause differences between male and female students due to perceived self-assessment skills. Colbert-Getz et al. (22) also stated that these scores are affected by anxiety and self-confidence. Female students may outperform male students because they study harder and are more prepared (46). Therefore, it can be concluded that female students had more self-confidence than male students. As a result, female students showed a far higher level of willingness to rate the items in the self-assessment questionnaire compared to male students. On the contrary, Vivekananda-Schmidt et al. (47), Deveze et al. (23), and Rees et al. (48) stated that female students tend to underestimate their self-assessment scores compared to male students (23, 48). There is a need for further studies on the relationship between self-assessment scores and gender.

Dental residents obtained higher scores than general students, and it is completely predictable, maybe because they have received more training courses, and the residency courses are more student-based compared to general dentistry curricula, which leads to more learning independence. White et al. stated that nursing students who gradually gain self-confidence in the clinical environment would gain a greater understanding of the clinical environment, better self-understanding, and be able to function independently, and focus on patients (49). Such findings could be applied to the dental educational environment, and as our study suggests, improving SA knowledge increases learning independence and performance. Bagherzadeh et al. suggested that public college students obtained higher scores than private college students, and the self-confidence of public college students is probably higher than private college students in some cases, which affects their self-assessment score, which is completely in line with our findings (50).

Yazdani et al. studied the opinions of final-year students of dental schools in Tehran, Qazvin, Semnan, and Qom regarding the acquired clinical skills using a self-assessment questionnaire. The authors stated that dental schools must make positive and constructive learning changes based on students' points of view to encourage and create more motivation and thus ensure

sustainable and continuous learning which is completely consistent with our findings (51). Biglerkhani et al. measured the knowledge and mastery of oral surgery skills among final-year students through a self-assessment method. The researchers documented the most elevated self-evaluation rating for the abilities that students had encountered in the corresponding departments (52). Also, the findings of Willey et al. (43), Iguchi et al. (53) and Muñoz et al. (40) seem familiar to our results, because we found that residents SA skills are at a higher level compared to general dental students, and that is attributed to their advanced learning courses along with more independence in training.

It is necessary to explain that the present study had some limitations, which affected the results to some extent. The most important of these limitations are as follows:

- The lack of a clear and precise definition of self-assessment skills caused students to answer questions based on their experiences, and personal understanding of its meaning.
- It was challenging to have access to the students considering the current pandemic and subsequent closure of the Kerman Faculty of Dentistry. Consequently, the researchers sent the questionnaires online, reducing the opportunity to explain the subject and clarify the study objective somewhat, although the self-assessment was defined at baseline.

Conclusion

The results of present study show that dental students of Kerman University of Medical Sciences have a high level of knowledge and understanding of practical self-assessment skills. The results also indicated that female students exhibited a greater level of knowledge and comprehension in SA skills compared to male students. Additionally, students enrolled in public universities shown a better level of SA skills compared to those in private institutions. Furthermore, residents exhibited a higher level of SA skills compared to general students. Considering the importance of self-assessment in the learning process, it is suggested to design SA teaching programs for professors as well as students, especially dental students.

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Conflict of interests: There is no conflict of interest.

Ethical approval: This study was approved by the Ethics Committee of Kerman University of Medical Sciences with the code of ethics IR.KMU.REC.1398.712.

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