

## Original Article

# Psychosocial impacts, perceived stress, and learning effects during the transition from preclinical to clinical dental education: Validation and translation of a questionnaire

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## ABSTRACT

**Background:** During the first experiences of clinical treatment, dental students face various challenges. The purpose of the study is to standardize the questionnaire as a suitable tool for quantitative and qualitative evaluation of psychosocial impact, stress levels, and learning effect of dental students during the transition from preclinical to clinical education in Persian.

**Materials and Methods:** In this cross-sectional study a questionnaire including three areas of psychosocial impact, perceived stress, and learning effect was systematically translated. In the group of experts, face validity was examined. Then, the content validity ratio (CVR) and the content validity index (CVI) were determined. The reliability of the questionnaire was determined by the test-retest method and the Cohen's Kappa coefficient. In a cross-sectional study, the psychosocial impact, stress levels, and learning effect of all students newly admitted to the endodontic, prosthetics, periodontics, and restorative dentistry departments of Shahid Beheshti Dental School (128 people) were measured. Mann-Whitney and Spearman-Rho were used for statistical analysis ( $P = 0.05$ ).

**Results:** During the CVR and CVI evaluation, 12 statements were removed from the questionnaire, and one statement was changed. All valid statements of the questionnaire were considered reliable. The initial questionnaire was finally developed in the form of 27 items. Interest in clinical treatment and collaboration between students and faculty had the greatest psychosocial effects. The highest level of stress among students was seen in the endodontic ward (mean = 3.8). The greatest effect of learning was seen in different sections in infection control (mean >4).

**Conclusion:** This study provided a standardized tool in Persian to evaluate the psychosocial impacts, perceived stress, and learning effect of dental students during the transition to clinical education and focused on the first clinical treatment experiences. One important psychosocial factor was collegiality between teachers and students. The ability to communicate well with the patient is thought to reduce stress.

**Key Words:** Dental student, learning effect, psychosocial impact, psychological stress

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## INTRODUCTION

Dental education is known as one of the most challenging and stressful educational fields. The desired outcome of any dental education program for students during their studies should be to improve the quality of their work in the future clinical profession.<sup>[1]</sup> During dental education, students are expected to develop professional behavior, competencies, and cognitive and psychological skills, in addition to clinical skills, to meet the requirements of clinical treatment. An important phase during education in dentistry is the transition from preclinical to clinical education, which has been of some interest to researchers.<sup>[2-8]</sup> This period of transition is described as a different emotional and social experience that can cause stress and anxiety, as well as personal and professional development.<sup>[9]</sup> During the first treatment experiences in this course, which usually occur during the 3<sup>rd</sup> or 4<sup>th</sup> year of study, students face a variety of challenges that affect the psychosocial impact,<sup>[10]</sup> perceived stress, and learning effect on students. During this transition period, in a very short time (several weeks), dental students need to master cognitive and psychological skills both to treat patients and to work with clinical professors. Besides, the practical skills they have learned during the preclinic courses should quickly become a success in the clinical setting, and the main focus will be on treatment and patient care.<sup>[11]</sup> This challenge is compounded by conditions such as patient management, following clinic health guidelines, and patient file completion. All these parameters affect the psychosocial impact, perceived stress, and the learning effect in students, especially during the 1<sup>st</sup> weeks of clinical treatment.<sup>[4]</sup> Many studies believe that dental students are prone to high levels of stress during their studies. Stress will have many negative consequences for students' physical and mental health as well as their social life,<sup>[12]</sup> and increasing stress will lead to a decrease in students' optimal performance.<sup>[13]</sup>

Among the studies on the psychological impact of the transition from preclinic to the clinic, certain patterns of increased psychological distress due to changes in the educational status of students can be seen.<sup>[2]</sup> Existence of knowledge gaps and differences between what has been learned in preclinical and clinical encounters by students were mentioned as the causes of stress and psychological stress in students,

which leads to unpleasant feelings in their treatment of patients and staff and a negative impact on self-confidence and their performance in the clinical setting.<sup>[3]</sup>

Most studies of the preclinic to clinic transition phase have studied students' stress; however, in 2018, Frese *et al.* considered the psychosocial state and learning effects of the transition period in German students in addition to stress levels.<sup>[14]</sup>

In Iran, the general dentistry educational program lasts 6 years, and from the sixth semester (3<sup>rd</sup> year), the presence of students in clinical departments begins. Since no study has been conducted to evaluate the psychological condition of dental students in Iranian universities during the transition from preclinic to the clinical setting, the purpose of this study was to standardize and implement a self-estimated psychosocial impact, perceived stress, and learning effect questionnaire conducted by Frese *et al.* in Persian to comprehensively study the effects of the courses on students to improve the educational structure and improve the quality of dental education.

## MATERIALS AND METHODS

In this cross-sectional study, to assess the psychosocial status of dental students during the transition from preclinic to clinic, first of all, a comprehensive search for sources and articles in creditable databases with the keywords of "dental students," "stress," and "transitional period" and their synonyms was done. Based on the objectives of the study and the experts' opinion, the proper questionnaire was selected to assess the psychosocial status of students in the first clinical weeks.<sup>[14]</sup> The selected questionnaire was designed by Frese *et al.* in 2018 for dental students in Germany. The reason for choosing this questionnaire was the similarities between the general dentistry curriculum in Iran and Germany, including the fact that the first units of students in the clinic are restorative dentistry, endodontics, and periodontics. Besides, in addition to stress levels, psychosocial impacts and learning effects of the transition period in students were also considered in this questionnaire. The initial questionnaire consisted of 40 items in three sections; in each section, with a short question, the statements were judged by the participants. The psychosocial impacts section had 16 statements, the perceived stress had 8 statements, and the learning effects had 16 statements. The evaluation

of each statement was defined on a 5-point Likert Scale (1 = never, 5 = almost always).

### Questionnaire translation

To ensure a conceptual correlation between the original questionnaire and the translated questionnaire, an inverted translation of the questionnaire was administered. First, the English questionnaire was translated into Persian by a bilingual specialist. Then, by an English expert and an English-speaking dentist who did not know the original version of the questionnaire, the Persian translation was translated back into English and reviewed and compared. By revision of a dental professor, a language specialist, and a dental student fluent in English, the initial version of the Persian-language questionnaire was prepared. This process helped the questionnaire to follow the same meanings and objectives of the main questionnaire in addition to being terminologically correct.

### Face validity

To assess the face validity, the questionnaire was provided to six professors of the relevant departments, and they were asked to comment on their perception of the questionnaire propositions, the conceptual level of the propositions, their appropriateness for study, and ambiguity. Finally, their opinions about the questionnaire were applied.

### Content validity

To determine the validity of content, content validity ratio (CVR) and content validity index (CVI) were used; the questionnaire was given to 13 professors of the relevant departments as a group of specialists, which included professors of the departments of periodontics (4 people), prosthetics (3 people), restorative (3 people), and endodontics (3 people). They were asked to determine the appropriateness of each statement of the questionnaire in accordance with the aim of the study – evaluating students in the first clinical treatment experiences – with the terms of “necessary, useful but unnecessary and unnecessary” scale, and also evaluate the perspective of relevance, clarity, and fluency by reading each statement. The CVR varies between +1 and -1, and only the questions that have a quorum of CVR (which is 0.54 in our study according to 13 experts) remain in the questionnaire. The average opinions of experts in the three areas of relevance, transparency, and fluency should be higher than 0.7 to accept the statement of the questionnaire in terms of CVI.

### Reliability of the questionnaire

The test–retest method was used to determine the reliability of the questionnaire. The questionnaire was given to 20 students in the 4<sup>th</sup> year of general dentistry that had passed the courses of prosthodontics, periodontics, restorative, and endodontics, and they were asked to complete the questionnaire. After 2 weeks, the questionnaire was given to the same students again, and they completed the questionnaire again; then, statistical analysis was performed using SPSS v. 26 software (IBM Corp. Released 2019. IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp). To determine the reliability of each question in the test–retest method, Cohen’s Kappa coefficient is used to examine the agreement between the initial and secondary answers. Kappa and its related statistical analysis are based on a numerical measurement between -1 and +1, which the closer to +1 indicates the existence of a proportional and direct agreement.

Finally, the standardized questionnaire was adjusted, which includes three sections: psychosocial impact (10 items), perceived stress (7 items), and learning effect (10 items), and it was organized for four departments: prosthodontics, periodontics, restorative dentistry, and endodontics. According to the purpose of the study, at the beginning of the questionnaire, some background questions of gender, living with family, drug use, and students’ teachers were included.

At the beginning of the winter semester of 2019, 168 questionnaires were given to 128 students of the 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> semesters (students of the 7<sup>th</sup> semester were given two questionnaires related to the departments of periodontics and restorative dentistry). The collected information was entered into SPSS software version 26. The reliability of the questionnaire was determined by the Cohen’s Kappa coefficient. Described indicators such as interest and standard deviation were employed. Statistical analysis was also performed with the Mann–Whitney test and nonparametric correlation analysis (Spearman–Rho). The significance level was considered 0.05.

### Ethical considerations

This research has been registered with the ethics code IR.SBMU.DRC.REC.1398.005 in the ethics committee of dental research of Shahid Beheshti University of Medical Sciences. Participants were informed that participation in the study was entirely

voluntary. The information is considered strictly confidential and is used only to review the results.

## RESULTS

In the CVR determination stage, based on the opinion of 13 experts, 12 items of the questionnaire that had a CVR <0.54 were removed. In the CVI evaluation, all propositions whose CVR was above 0.54 had a minimum CVI of 0.7, except for the proposition “test conditions” (proposition 13), which changed its form to “examination situation instead of learning conditions,” and its CVI was upgraded to 0.7. Finally, the standardized questionnaire, which includes three sections of psychosocial impacts (10 statements), perceived stress (7 statements), and learning effect (10 statements), was applied under four clinics of prosthodontics, periodontics, restorative dentistry, and endodontics.

Out of 128 students (168 questionnaires) who entered the study as a sample size, 117 students (147 questionnaires) completed the questionnaire (91% response rate), of which 59 (50.4%) were boys and 58 (49.6%) were girls.

In the restorative dentistry and removable prosthesis clinic, female students had more stress ( $P = 0.033$ ,  $P = 0.041$ ), and in other clinics, there was no significant difference between the stress of male and female students.

No significant relationship was found between living with family, grade point average, and basic science test scores with students' stress level. In this study, there was no relationship between students' grade point average and basic science test score and their self-estimated learning effect in clinics.

The highest percentage of drug use to control stress was observed among 8<sup>th</sup>-semester students (29.8%). Among 6<sup>th</sup>- and 7<sup>th</sup>-semester students, more drug use was reported in girls than boys.

The first part of the questionnaire included 10 questions in the form of an evaluation of psychological effects and experienced emotions; the results for each statement were averaged (1 = rarely, 5 = almost always) in different clinical wards.

In the 1<sup>st</sup> weeks of clinical training, the highest mean score was observed in “complete and proper personal management” in the prosthetics and periodontics clinics, and in the restorative and endodontics

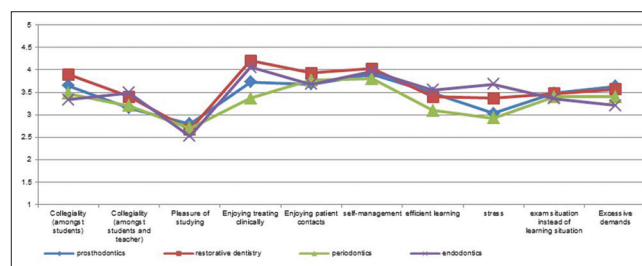
sections, “enjoying treating clinically” had the highest average. “Pleasure of studying” had the lowest mean in all sections [Figure 1].

In the prosthetics clinical ward, there is a significant relationship between “collegiality (among students and teacher)” with “collegiality (among students)” ( $P = 0.012$ ), “enjoying patient contacts” ( $P = 0.013$ ), “good and appropriate personal management” ( $P = 0.046$ ), and “efficient learning” ( $P = 0.00$ ). Further, increased stress was significantly associated with “examination situation instead of learning conditions” ( $P = 0.003$ ) and sometimes “excessive demands” (professors, ward, and patients) ( $P = 0.004$ ).

In the restorative ward, significant relationships were observed between increasing stress by decreasing the “enjoying treating clinically” ( $P = 0.029$ ), “examination situation instead of learning conditions” ( $P = 0.001$ ), and sometimes “excessive demands” ( $P = 0.006$ ).

In the periodontics clinic, “collegiality (among students and teacher)” had a significant relationship with “collegiality (among students)” ( $P = 0.024$ ), “enjoying treating clinically” ( $P = 0.024$ ), “good and appropriate personal management” ( $P = 0.048$ ), and “efficient learning” ( $P = 0.000$ ). Further, increasing stress reduces the “enjoying patient contacts” ( $P = 0.023$ ).

In the endodontics clinic, there was a significant relationship between “good and appropriate personal management” with “pleasure of studying” ( $P = 0.000$ ), “enjoying treating clinically” ( $P = 0.007$ ), “enjoying patient contacts” ( $P = 0.000$ ), and “efficient learning” ( $P = 0.000$ ). In addition, a significant relationship was found between the reduction of sometimes excessive expectations (faculty, ward, and patients) and the enjoyment of clinical treatment ( $P = 0.026$ ). Stress was significantly



**Figure 1:** Mean psychosocial impacts in different clinical wards (1 = never, 5 = almost always).



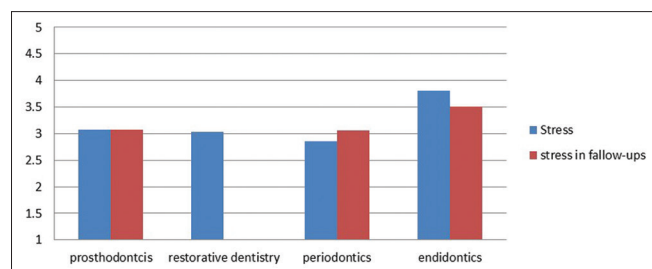
associated with test conditions instead of educational conditions ( $P = 0.046$ ) and sometimes excessive expectations (faculty, ward, and patients) ( $P = 0.011$ ).

The second part of the questionnaire for each clinical ward included two questions (for restorative dentistry, one question) asking about self-perceived stress in that ward and during the following up appointments [Figure 2].

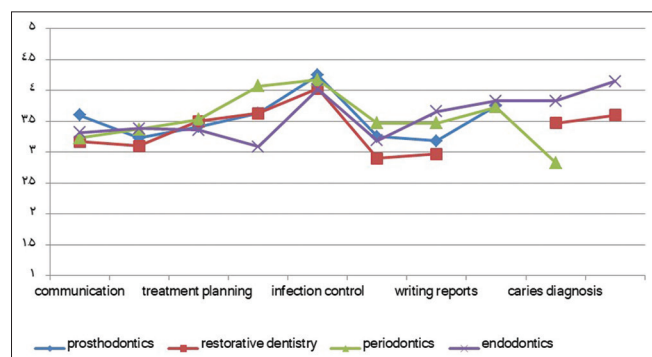
The third part of the questionnaire includes 10 questions on the self-estimated learning effects: In the 1<sup>st</sup> weeks of clinical training, the “infection control” learning effect had the highest average in the prosthodontics, restorative dentistry, and periodontics clinics, and in the endodontics clinical ward, “caries excavation” had the highest average of learning effect. The lowest average learning effects in the prosthodontics clinic was “writing treatment reports,” in the restorative dentistry was “preventive care,” in the periodontics clinic was “caries diagnosis,” and in the endodontics clinical ward was “oral hygiene instructions.” [Figure 3].

## DISCUSSION

The present study is one of the first studies to standardize and implement a Persian questionnaire



**Figure 2:** Average perception of stress in different sectors (1 = never, 5 = almost always).



**Figure 3:** Mean effect of learning in different clinical wards (1 = never, 5 = almost always).

in the field of transition from preclinic to the clinic during dental education and to analyze the psychosocial impacts, stress, and learning of dental students in the first clinical treatment experiences.

The standardized questionnaire in this study focused on students’ assessment of their first clinical treatment experiences. In previous studies, the Dental Environment Stress Questionnaire was used to assess the stress of dental students,<sup>[5,15-19]</sup> which was based on long-term preclinical and clinical experiences of students.

In Frese *et al.*’s study, the relationship between teacher and student and effective cooperation with the teacher-made students feel better, which was one of the important psychological factors.<sup>[14]</sup> In other studies, accurate feedback from the teacher helps the student to learn better, and it was found that if the evaluation is with nonthreatening feedback to students and there is a good relationship with students, the clinical education environment will be less stressful.<sup>[11,14,17,20]</sup> In the results of the present study, “collegiality (amongst students and teacher)” was associated with more psychosocial impacts in the prosthodontics and periodontics clinical wards. This proper relationship leads to improving the student’s self-management and proper learning.

One of the main identified causes of stress in dental students is the examinations and fear of failing,<sup>[5,8,15,17,18]</sup> and creating examination situation in the clinic can also lead to stress, which in the present study is often the case. Stress increased with the creation of “examination situation” and “excessive demands.”

In this study, the highest level of stress in the first clinical treatment experiences was reported in the endodontic clinic, which was confirmed by other studies.<sup>[8,14]</sup>

According to the results of previous studies, communication with the patient is another important stressor.<sup>[5,19,20]</sup> Here, as well, appropriate communication with patients in periodontic clinic leads to less perceived stress.

In this study, the greatest learning effect was reported in the field of “infection control;” however, in previous studies, important learning effects were seen in the diagnosis, treatment planning, and caries excavation.<sup>[14,20]</sup> It may be related to the curriculum content of each program. Here, in our school, “infection control” modules are constantly repeated.

One of the limitations of this study is the limited number of newly admitted students from the preclinical to the clinical course in each department, which suggests that further studies be conducted in several faculties.

## CONCLUSION

In general, the results of the present study show that the highest mean score of psychosocial impact is in the “enjoying treating clinically” in endodontics and restorative dentistry wards. In the prosthetic and periodontic sections, “collegiality (among students and teacher)” was associated with greater psychological effects. The highest level of self-estimated perceived stress was seen in the first clinical treatment experiences at the endodontic clinic.

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### Conflicts of interest

The authors of this manuscript declare that they have no conflicts of interest, real or perceived, financial or non-financial in this article.

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