



Dentistry course student monitors' performance in the construction of the diagnosis and treatment plan for dental patients

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Abstract The aim of the present study was to evaluate the performance of students, who participated in the Monitoring Program of the Dentistry Course at the Federal University of Juiz de Fora, in subjects with clinical practices, relative to construction of the diagnosis and treatment plan, to compare these skills with those presented by non-monitor students. For this purpose, a questionnaire was applied to 12 students who had participated in the monitoring program in subjects with clinical practices, and to 12 students who were not monitors. The questionnaire consisted of six questions about the profile of student monitors and their experience with the program; and three fictitious clinical cases that allowed evaluation of the construction of the diagnosis and treatment plan. The answers to the questions about the students' profile were presented in absolute and relative frequencies. For each clinical case, T-tests for independent samples were used to compare the scores of student monitors and students who were not monitors. The results obtained showed that there was no significant difference between the two groups evaluated, relative to the scores attributed to the responses to the clinical cases. Among the reasons that led students to participating in monitoring programs, the following were outstanding: "opportunity to reinforce knowledge", "increase the CV score" and "because of the remuneration". Interest in teaching was the least prevalent justification. It can be concluded that although the result did not show a difference between students, the practice of monitoring has been relevant, by contributing to the development of skills and abilities that are essential to the training of dental surgeons.

Descriptors: Education, Dental. Students, Dental. Mentoring, Diagnosis. Patient Care Planning.

Desempeño de los estudiantes tutores del curso de odontología en la construcción del plan de diagnóstico y tratamiento de pacientes odontológicos

Resumen El objetivo del presente estudio fue evaluar el desempeño de los estudiantes que participaron del Programa de Tutoría de la Carrera de Odontología de la Universidade Federal de Juiz de Fora en materias con prácticas clínicas, en relación a la construcción del plan de diagnóstico y tratamiento, comparando estas habilidades con las presentadas por estudiantes no tutores. Para ello se aplicó un cuestionario a 12 estudiantes que habían participado en el programa de tutoría en asignaturas con prácticas clínicas y a 12 estudiantes no tutores. El cuestionario constaba de seis preguntas sobre el perfil de los estudiantes tutores y su experiencia con el programa; y tres casos clínicos ficticios, que permitieron evaluar la construcción del diagnóstico y plan de tratamiento. Las respuestas a las preguntas sobre el perfil de los estudiantes se presentaron en frecuencias absolutas y relativas. Se utilizaron pruebas T para muestras independientes para comparar las puntuaciones de los estudiantes tutores y no tutores para cada caso clínico. Los resultados obtenidos mostraron que no hubo diferencia significativa entre los dos grupos evaluados en las puntuaciones obtenidas de las respuestas a los casos clínicos. Entre los motivos que llevaron a los estudiantes a participar en programas de tutoría destacan: "oportunidad de reforzar conocimientos", "aumentar la puntuación del currículo" y "por la remuneración". El interés por la enseñanza fue la justificación menos frecuente. Se puede concluir que, si bien el resultado no mostró diferencia entre los estudiantes, la práctica de tutoría ha sido relevante, contribuyendo al desarrollo de habilidades y habilidades esenciales para la formación de los cirujanos dentistas.

Descriptorios: Educación en Odontología. Estudiantes de Odontología. Tutoría. Diagnóstico. Planificación de Atención al Paciente.

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Desempenho de discentes monitores do curso de Odontologia na construção do diagnóstico e plano de tratamento de pacientes odontológicos

Resumo O objetivo no presente estudo foi avaliar o desempenho de discentes, que participaram do Programa de Monitoria no Curso de Odontologia da Universidade Federal de Juiz de Fora em disciplinas com práticas clínicas, em relação à construção do diagnóstico e plano de tratamento, comparando essas habilidades com as apresentadas por alunos não monitores. Para isso foi aplicado um questionário a 12 alunos que haviam participado do programa de monitoria em disciplinas com práticas clínicas e a 12 alunos não monitores. O questionário foi composto por seis questões sobre o perfil dos discentes monitores e a experiência desses alunos com o programa; e por três casos clínicos fictícios, que permitiram a avaliação da construção do diagnóstico e do plano de tratamento. As respostas das questões sobre o perfil dos discentes foram apresentadas em frequências absolutas e relativas. Testes t para amostras independentes foram utilizados para comparar as notas dos discentes monitores e não monitores para cada caso clínico. Os resultados obtidos mostraram que não houve diferença significativa entre os dois grupos avaliados nas pontuações obtidas pelas respostas aos casos clínicos. Dentre os motivos que levaram os discentes a participar dos programas de monitoria, destacam-se: "oportunidade de reforçar o conhecimento", "aumentar a pontuação do currículo" e "por causa da remuneração". O interesse pela docência foi a justificativa menos prevalente. Pode-se concluir que, mesmo que o resultado não tenha mostrado diferença entre os discentes, a prática da monitoria tem sido relevante, colaborando para o desenvolvimento de competências e habilidades que são indispensáveis à formação do cirurgião-dentista.

Descritores: Educação em Odontologia. Estudantes de Odontologia. Tutoria. Diagnóstico. Planejamento de Assistência ao Paciente.

INTRODUCTION

Article 84 of Law No. 9,394/1996¹, which defines the guidelines and bases of education, regulates the monitoring functions carried out by higher education students, according to their performance and study plan. In accomplishing their activities, monitors are responsible for assisting teachers in attending to other students, with the aim of clarifying doubts about a specific subject in the course. Furthermore, to be a monitor, characteristics such as: affinity for the teaching career, ease in passing on knowledge, having passed the target subject of monitoring and having a minimum available workload are essential attributes².

The monitoring program can be pointed out as being precursor and strengthener of the teaching-learning process, as it helps to create a space for dialog and contribution, in which students and teachers allow themselves to learn and teach, refuting the bases of learning traditional, in which there is no room for horizontal transfer of learning content³. This process, which seeks to break with the traditional teaching bases, guided by strategies of verticality, has been shown to be a challenge to teachers, students, and educational institutions. In view of the foregoing, the experience gained through participation in monitoring programs allows the student monitor to gain a critical-reflexive experience, the refinement of criticality relative to the performance of their functions and stimulates their aptitude for teaching⁴.

Monitors engaged in teaching practice, acquire skills that help them in their academic development towards professional life, by acquiring skills such as: organization, communication, body language, personal and professional planning, leadership, teamwork, decision making, the formation of bonds and empathy; providing the training of a professional with critical sense and autonomy⁵. Student monitor training and acquisition of the skills referred to through the monitoring program can be exceptionally important for undergraduate Dentistry students, as health education predisposes students to combining the knowledge obtained in the classroom with clinical practice, emphasizing the capacity for clinical judgment is inseparably related to practical experience^{6,7}. Furthermore, it is important to develop studies in the field of dental education to identify challenges and barriers in relation to the integration of knowledge from the basic and clinical cycles during graduation, thereby helping to develop future programs that place value on and encourage integrative proposals⁸.

Although the importance of the monitoring program in the construction of the monitoring student's training, in the continued training of teachers and in the construction of active teaching-learning methodologies is understood, however, a gap is pointed out relative to the offer of this program, associated with the lack of a tool to evaluate it systematically. The acquisition of knowledge about these aspects would minimize compromising the quality and performance of the program, by becoming aware of its limitations and potential^{9,10}. Greater visibility on the topic should be encouraged, with a view to measuring the relevance of monitoring in the development of professionals and its impact on the pedagogical plan of courses, in studies that focus on these relationships³. At present, there are few studies that evaluate monitoring programs in Dentistry courses in Brazil⁴, especially with more objective approaches, involving assessment of the application of specific knowledge acquired by monitoring professors. Reul *et al.* (2016)⁴ presented a report on experience with active methodologies used in teaching Dentistry and only mention the contribution of monitoring to the creation of a critical-reflexive student profile and to stimulate the vocation for teaching.

With the purpose of understanding the role of the University Monitoring Program in the academic training of undergraduate Dentistry students, in the maturation of their self-confidence, development of their skills and application of the knowledge learned, this study proposed to evaluate the performance of monitors, who worked in dental disciplines with clinical practices, in the task of constructing the diagnosis and treatment plan. These skills were compared with those presented by non-monitor students.

METHOD

This cross-sectional quantitative research was developed after approval by the Research Ethics Committee of the Federal University of Juiz de Fora (UFJF) (CAAE: 55817722.3.0000.5147), is in accordance with Resolution No. 466/2012¹¹ of the National Health Council. The study sample was composed of 12 students from the Undergraduate Dentistry course at UFJF, who participated in a monitoring program in subjects with clinical practices; and 12 non-monitor students from the Undergraduate Dentistry course at UFJF, who were in the same graduation period as the participating monitor students, for at least one academic semester during the period from August 2021 to May 2022. Considering that 19 (55.8%) of the 34 vacancies for monitor scholarships at the UFJF School of Dentistry are for disciplines with clinical practices, the sample number of 12 student monitors was associated with a confidence level of 95%, with a maximum error of estimated 18%. It was not possible to increase the sample number, due to the COVID-19 pandemic since in-person practical activities were suspended in the periods prior to data collection. All participants were duly informed about the present study and signed the Informed Consent Form (ICF).

Students who were studying the last three periods of the Dentistry course (eighth, ninth and tenth) were included. Student monitors could or could not be scholarship holders. Student monitors who worked in exclusively theoretical or laboratory monitoring programs or those who did not have the opportunity to carry out monitoring in person in subjects with clinical practices were excluded from the study due to the pandemic. Relative to non-monitoring students, those who participated in any monitoring were excluded, even those related to exclusively theoretical or laboratory disciplines.

The strategy of this study was based on the application of an anonymous questionnaire, in which no personal identification (name and/or any identification documents, such as: Identity, Tax Registration or enrollment number) were requested. This instrument was applied in person in June 2022.

The questionnaire consisted of six initial questions with the aim of better understanding the profile of student monitors and their experience with the program. These questions had answer options that varied between: "completely agree, partially agree, neither agree nor disagree, partially disagree and totally disagree" in addition to an option to be marked by non-monitoring students, in which they informed that they had not participated in the monitoring program.

After the initial questions, three fictitious clinical cases characteristic of 1) periapical endodontic changes, 2) included or impacted teeth and 3) maxillomandibular bone lesions were also described in the questionnaire.

The cases covered presented fictitious clinical situations described in detail, including relevant data from anamnesis, symptoms, intra and extraoral clinical examinations, presenting the pattern of development of the lesions, time of evolution, and representation by complementary imaging exams, if necessary. The clinical situations presented were designed to allow students who had already completed up to the seventh period of the Dentistry course to understand the questions asked. The clinical cases were written by the professor responsible (KLD) for the Clinical Propaedeutics

discipline at the UFJF School of Dentistry together with other specialist professors and set out both objective and discursive questions.

In the clinical case concerning periapical endodontic alteration, the participant was asked to indicate the correct diagnosis of the alteration, treatment (biopulpectomy or necropulpectomy), systemic medication recommended for the condition and the indication of possible restorative materials that could be used for the provisional sealing of the dental crown in question. In the case referring to the impacted tooth (mandibular third molar), the student was asked to indicate which nerves should undergo anesthetic block to perform the extraction, which surgical technique should be used in the case presented, two possible complications resulting from the extraction, in addition to indicating the classes of medication that could be prescribed for the fictitious patient. For the case of bone tumor, volunteers were asked to indicate the diagnostic hypotheses, possible therapeutic approaches, and a possible differential diagnosis for the lesion that had been illustrated.

Participants had a maximum time interval of 1 hour to answer the questionnaire. The answers provided were duly evaluated by two calibrated teachers and members of the research team, who carried out the corrections independently, but followed a correction key that was applied jointly. If there was disagreement in the score of any question, a consensus was reached between them. Each question had a maximum score of 1 point, with 11 points being the highest possible score.

Shapiro-Wilk normality tests were applied to verify the sample distribution. T-tests for independent samples were used to compare the scores of student monitors and students who were not monitors in general, and for each clinical case individually. The program *Statistical Package for the Social Sciences* (SPSS for Windows, version 21.0, IBM, Armonk, NY, USA) was used, with a significance level of 5%.

RESULTS

The student monitors had previously participated in monitoring in the following subjects: Dentistry (25%), Periodontics (16.7%), Pediatric Dentistry (16.7%), Surgery (8.3%), Occlusion (8.3%) and Total Prosthesis (8.3%). Two students (16.7%) had been monitors in two different subjects in the last year.

When asked whether participation in the monitoring program had added knowledge and experience to their academic experience, and whether the student would recommend the monitoring they had undertaken, all participants responded positively, with 83.3% completely agreeing with the statements and 16.7% partially agreeing.

Table 1 shows the responses of student monitors relative to the reason that led them to participating in monitoring programs, with the following justifications being emphasized: "having the opportunity to be in more contact with clinical cases and solidifying knowledge", "increasing the score on my CV" and "because of the remuneration related to scholarships".

Table 1. Prevalence of responses from student monitors relative to the reason that led them to participating in monitoring programs.

Variable	1 n (%)	2 n (%)	3 n (%)	4 n (%)	5 n (%)
More contact with clinical cases	12 (100.0)	-	-	-	-
Increase curriculum score	7 (58.4)	3 (25.0)	1 (8.3)	-	1 (8.3)
Because of the scholarship (remuneration)	5 (41.7)	3 (25.0)	1 (8.3)	-	3 (25.0)
To get closer to teaching	3 (25.0)	3 (25.0)	3 (25.0)	1 (8.3)	2 (16.7)

1. Completely agree; 2. Partially agree; 3. Neither agree nor disagree; 4. Partially disagree; 5. Totally disagree.

Relative to the comparison of monitor and non-monitor students' performance, there was no significant difference in the grades obtained (Table 2).

Participants took an average of 35 minutes to answer the questionnaire and no significant complications were identified during the application.

Table 2. Comparison between monitor and non-monitor students.

Caso	Monitor			Non-Monitor			P value
	Minimum	Maximum	Mean (SD)	Minimum	Maximum	Mean (SD)	
1 (4 points)	1.5	4.0	2.7 (0.8)	1.5	4.0	2.7 (0.8)	0.82
2 (4 points)	2.5	4.0	3.4 (0.5)	2.5	4.0	3.3 (0.6)	0.73
3 (3 points)	-	2.0	1.1 (0.6)	0.5	2.5	1.3 (0.5)	0.51
Total (11 points)	4.5	10.0	7.2 (1.4)	5.0	9.5	7.4 (1.4)	0.78

SD: Standard deviation.

DISCUSSION

In accordance with the provisions of law No. 9,394/1996¹ and with the purpose of improving the policy and standards that regulate the activity of undergraduate monitoring, and performing constant evaluation of the program, the UFJF resolution No.123/2016¹², establishes the guidelines for implementing the monitoring program at the institution. In accordance with these guidelines, students who meet prerequisites such as: approval in the subject(s) object of monitoring; are considered eligible to participate in monitoring programs; approval in the selection process and availability of 6 or 12 hours per week, according to the work regime approved by the Academic Unit². From this perspective, the practical disciplines of the Dentistry course may, annually request monitors, who will work in the clinic, based on the presentation of the project to a collegiate body of the Academic Unit. It is worth emphasizing that most Brazilian Federal Public Universities also have monitoring programs in their undergraduate courses¹³.

Aware of the need for studies on the impacts of the monitoring program on students' academic performance⁹, this study sought to evaluate student monitors of the Undergraduate Dentistry Course, regarding the construction of the diagnosis and treatment plan, by comparing these skills with those presented by non-monitor students. Considering that student monitors are more experienced, nevertheless, they did not obtain higher average grades than non-monitor students, several studies that have compared participants with varied clinical experience have also obtained similar results. Mileman and van der Hout (2002)¹⁴ observed the absence of significant differences in the diagnostic accuracy of dentistry students and dental surgeons when diagnosing dentin cavities. Bussaneli *et al.* (2015)¹⁵ who compared the influence of clinical experience in the detection and treatment decision of occlusal caries lesions in primary molars between participants with experience in clinical practice and second-year undergraduate Dentistry students. They concluded that experience did not influence the visual ability and radiographic interpretation to detect caries lesions, however, it did interfere in the lesion treatment planning process. Kratz *et al.* (2018)¹⁶ found no significant differences between second-year undergraduate students, when compared with those enrolled in the third and fourth year, regarding the interpretation and identification of errors in the positioning of panoramic radiographs. Maeda *et al.* (2018)¹⁷ found no significant differences between students in the fifth and sixth year of the undergraduate Dentistry course, relative to improvement in understanding the anatomical structures present in radiographs. Furthermore, Éder *et al.* (2021)¹⁸, conducted a study that sought to evaluate improvement in the diagnostic performance of Dentistry students in the interpretation of panoramic radiographs. They observed that there was no significant improvement in diagnostic performance among students in the seventh and ninth semester of the Dentistry course.

However, despite the absence of significant differences in student grades, in the study of Kumar and Gadbury-Amyot (2012)¹⁹, on teaching transition models, they compared the traditional model with a team using a learning model based on clinical cases. These authors pointed out that although there was no significant difference between the groups evaluated, they observed that the active, student-centered methodology was well accepted by Dentistry students, who perceived a more extensive acquisition of knowledge through case discussions. Moreover, the students also considered that learning was more meaningful and relevant. Therefore, the cited authors pointed out that active teaching methodologies allowed the search for complementary sources of learning, in addition to the recommended books and texts. Furthermore, there was greater interaction between students, and the attribution of additional responsibility. Considering that monitoring programs lead to active participation of students in the teaching-learning process, we can point out that the advantages of participating in these programs go beyond grades. In the present study, this was perceived by the positive evaluations of the students who participated in the monitoring, considering that these programs

added knowledge and experience to their academic experience, to the point that these students recommended the monitoring activities to other students.

When evaluating the reasons that led students to participating in monitoring programs, the option "to have the opportunity for greater contact with clinical cases and solidification of knowledge" had 100% positive responses, with all participants completely agreeing with the affirmation. This information was in agreement with the findings of Tostes *et al.* (2020)²⁰, who researched the degree of perception of Dentistry students relative to learning based on clinical cases. In their study, the authors concluded that this learning method generated a positive impact, as it allowed the student to work in more realistic situations, by means of the combination of theory and practice. In view of the foregoing, we understood that the student's critical vision could be transformed by exercising the role of monitor, with the added possibility of awakening and searching for scientific knowledge²¹. The monitor function enables honing of the skills and technical dexterity that are imperative requirements of practical activity²².

When observing the objectives of the monitoring program, among which the function of providing students with an interest in a teaching career¹², is emphasized, in the perception of the participants in this study, it was noted that the statement "to bring me closer to teaching" was the response option that received more variable answers, with 25% of students completely agreeing, 25% partially agreeing, 8.3% partially disagreeing and 16.7% totally disagreeing. Despite the different perspectives presented relative to this topic, this practice is known to lead to the discovery of teaching skills²³. Academic monitoring provides students with opportunities to gain information that extends beyond their curricular component, which requires the students to engage in constant study, in favor of effective performance, together with the teacher, who supervises and guides their functions, thereby contributing to the development of skills for a future of teaching in higher education⁵. Jesus *et al.* (2012)¹³ in an approach to the objectives of monitoring programs at 59 Brazilian federal universities, highlighted three objectives in common among the universities: 1. Arouse (students) interest in research and teaching; 2. Contribute to the quality of teaching and undergraduate courses; 3 Promote cooperation and academic interaction between students and teachers.

Working in academic monitoring can provide improvements in the teaching-learning process, as the monitor has autonomy relative to the choice of learning tools. They can work on their teaching and complement gaps in the target content of the monitoring process^{5,24}. Learning how to engage in clinical reasoning is complex. It requires the application of professional knowledge arising from the accumulation of experience gained from participating in real clinical cases²⁵. Therefore, encouraging students to use all the available tools to sharpen critical thinking and skills will provide better results in health education and practice⁶.

The positive result of the self-perception of the students evaluated relative to the monitoring programs, contributes to increasing their self-esteem, helping them to maintain their degree course, thereby reducing the number of withdrawals and dropouts. Furthermore, the possibility of experiencing different monitoring projects, reduces the risk of early specialization, which could compromise the professional training of a generalist dental surgeon, recommended by the National Curricular Guidelines for the Dentistry course^{26, 27}.

In the present study, due to the clinical activities and, consequently, their respective monitoring programs that were interrupted for a long period of time, the number of participating monitors was limited. Continued evaluations involving a larger number of students are necessary to verify the real impact of these programs on the training of the students participating in them. In this study, it was possible to use quantitative analysis to evaluate the students' performance relative to the construction of the diagnosis and treatment plan, the students' self-perception relative to monitoring, and the reasons that led them to participate in the program. Future evaluations could be made by using qualitative and quantitative research, to improve understanding of the numerical data found.

Finally, it is important to emphasize that training and clinical practice during graduation in Dentistry are essential activities for a solid education, guided by scientific knowledge that allows correct exercise of the profession, thereby guaranteeing quality and excellent care. Therefore, during the undergraduate Dentistry course, work in extracurricular programs that provide a greater workload of clinical experience and close contact with faculty advisors, should be encouraged.

CONCLUSION

The results found in this study showed that there is no significant difference between the performance of students who participated in the Monitoring Program in the UFJF Dentistry Course in subjects with clinical practices, relative to

construction of the diagnosis and treatment plan, when compared with students who were not monitors. Among the reasons that led students to participating in monitoring programs, the following were outstanding: "opportunity to reinforce knowledge", "increase the curriculum score" and "because of the remuneration". Interest in teaching was the least prevalent justification. It was also possible to verify that the monitoring program has a positive impact on the experience of its participants and contributes to the development of skills and abilities that are essential to the training of dental surgeons.

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