Pesquisa Brasileira em Odontopediatria e Clínica Integrada 2024; 24:e230049
https://doi.org/10.1590/pboci.2024.036
ISSN 1519-0501 / eISSN 1983-4632

ORIGINAL ARTICLE

Knowing Dental Students' Discourses on Situational Planning in Integrated Clinic: A Qualitative Study

François Isnaldo Dias Caldeira[1], Mariana Martins de Vitro[2], Ihanael Ifanger[2], Leandro Araújo Fernandes[2], Renata Ribeiro Bruzadelli[2], Rodrigo Alvitos[3], Larissa Santana Rodriguez[2]

[1]Department of Diagnosis and Surgery, Araraquara School of Dentistry, Paulista State University, Araraquara, SP, Brazil.
[2]School of Dentistry, Federal University of Alfenas, Alfenas, MG, Brazil.
[3]Medical Center 2, Barra da Tijuca, Rio de Janeiro, RJ, Brazil.

Correspondence: Larissa Santana Rodriguez **E-mail:** dralarissarodriguez@gmail.com

Academic Editor: Wilton Wilney Nascimento Padilha

Received: March 12, 2023 / **Review:** May 22, 2023 / **Accepted:** July 26, 2023

How to cite: Caldeira FID, Vitro MM, Ifanger I, Fernandes LA, Bruzadelli RR, Alvitos R, et al. Knowing dental students' discourses on situational planning in the integrated clinic: A qualitative study. Pesqui Bras Odontopediatria Clín Integr. 2024; 24:e230049. https://doi.org/10.1590/pboci.2024.036

ABSTRACT

Objective: Dentistry from the Universidade Federal de Alfenas who were enrolled in the seventh period and who took the Integrated Clinic I Discipline (ICID) in the emergency remote learning model (ERLM). **Material and Methods:** This is a qualitative and descriptive study. The information was collected through questionnaires applied by the Professors during the ICID. Subsequently, the professor evaluated the treatment developed in virtual form by each student regarding its logical sequence and the most appropriate treatment for each case. The results of the answers were transcribed and submitted to lexicographical textual, Descending Hierarchical Classification, and Similitude analysis in the *Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires* (IRAMUTEQ) program. **Results:** The students described the online situational treatment planning in five essential steps: adequacy of the oral environment, restorative need, prosthetic need, rehabilitation by prosthesis on the implant, and corrective orthodontic treatment. **Conclusion:** It was observed that the students who enrolled in ICID presented well-integrated planning during ERLM, despite the COVID-19 pandemic hindering these students' contact between theoretical teaching and the integrated practices in dentistry offered by the educational institution.

Keywords: COVID-19; Dental Clinics; Education, Distance; Patient Care Planning.

Introduction

As for the premises of the Health System in Brazil, the Superior Education Institutions (SEI) operate as service providers to the population, being an option for health care. They must be able to present solutions to patients' problems using these services [1].

The vast majority of SEI that offer Dentistry courses have their curriculum to distribute the teaching throughout the academic periods. However, clinical practice is recommended to be developed in an isolated manner at the beginning so that towards the end of the course, it is necessary to integrate all the practices for the student to experience and understand the complexity of the profession [2].

The ICID was created to integrate all the knowledge acquired throughout the Dentistry course and enable the formation of a competent general practitioner [3]. This discipline is essential for the future dental surgeon. It aims to add and review all the knowledge previously obtained by the student in the disciplines to develop a professional who knows how to correctly examine, prevent, and diagnose oral, orofacial, dental, and periodontal lesions, also to plan and execute the proposed treatment, whether clinical, surgical, restorative or rehabilitating and finally, provide follow-up after treatment through periodic consultations [2,4-6].

The worldwide paralysis due to the emergence and spread of the SARS-CoV-2 virus and, consequently, the COVID-19 pandemic has fueled discussions about Distance Education (DE) and ERLM. In DE, there is all the planning and execution for the activities to be online, supporting pedagogical choices and organizing teaching and learning processes. ERLM is an alternative temporary curricular adaptation. In this form, academic activities that used to be presential could take place in a remote or hybrid way until it is possible to return to the presential form [7].

The decree from the Ministry of Education (MEC) of Brazil no. 343, 17 March 2020, regulated substituting face-to-face classes for online classes during the COVID-19 pandemic period. Also, in an attempt to support and legalize the ERLM, the National Board of Education released an opinion favoring the reorganization of the school calendar and the possibility of non-contact activities to meet the minimum annual workload during the pandemic. In May of the same year, the opinion was approved by the MEC [8].

Thus, in most educational institutions, teaching started to occur remotely and expanded the conception of education through new technologies. Adaptations in the universities, professors, and students were necessary to the alternative learning model, and some dental courses have opted to teach specific subjects online to give continuity to the content and avoid long delays while maintaining the quality of teaching [8].

Academic training in dentistry is a great concern since clinical practice is extremely important. It also requires planning for subsequent intervention, which refers to the importance of ICID. Treatment success is closely related to creating and performing an effective treatment plan for each specific case. Thus, when planning a clinical case, the student must consider numerous factors, such as the patient's oral health status, financing conditions for the procedures, longevity, likelihood of treatment success, working time, probable complications, patient's needs, and expectations [6].

The School of Dentistry of the Federal University of Alfenas [9] was one institution that offered some disciplines in the ERLM. One of the disciplines offered online during the COVID-19 period was the ICID. This study analyzed the speeches of the seventh-period students enrolled in this discipline in its remote format, demonstrating the ability to elaborate treatment plans and planning in the face of a proposed clinical case.

Material and Methods

This study followed the guidelines proposed by Checklist Standards for Reporting Qualitative Research (SRQR) for qualitative studies [10].

Ethical Clearance and Study Design

This study was approved by the Ethics Committee on Research with Human Beings of Federal University of Alfenas (UNIFAL) under opinion no. 3.664.769/2019. The informed consent form was made available via institutional e-mail to participating students over 21.

This qualitative, descriptive study was carried out with seventh-period students who took the optional ICID in the ERLM. The final sample comprised 55 students.

In Brazil, Dentistry is a science focused on caring for individuals' physical (oral health) and social (perceived quality of life in oral health) well-being. The ICID was introduced to improve knowledge and planning of clinical execution. We point out that this virtual discipline model was conducted in only one edition (Table 1).

Table 1. Characterization of the Integrated Clinic I Discipline curricular grid in the online model.

Course Unit/Optional Discipline	Integrated Clinic I
Unit of Studies	Study of clinical problems in several areas of dentistry (occlusion, dentistry, periodontics, endodontics, and prosthetics) through elaborating plans, treatment plans, and fee simulation.
Participants	Students in the Dentistry course's 7º, 8º, and 9º periods.
Requisites	Have successfully completed Periodontics I, Endodontics I, Fixed Partial Dentures, and Restorative and Preventive Dentistry I.
Period of Studies	5 months. Once a week.
Hourly Load	Theoretical: 30 hours Practice: not applicable
Learning Objective(s)	To prepare the student to act as a generalist dentist, developing critical and logical reasoning when facing different clinical situations.
Virtual Environment for Learning	Google Meet and Moodle Academic.
Communication Platform	Moodle Academic.

Data Collection

The information was collected through UNIFAL Moodle platform between September 25 and 29, 2021. Students who had participated in ICID at ERLM had to develop a treatment plan for the proposed clinical case based on the patient's socioeconomic conditions. The proposed activity was performed with radiographic, photographic (intra and extra oral), and audiovisual resources. The students had to describe all the clinical steps for the case. The test lasted 1 hour and was performed individually, without consultation. The Google Meet platform was used to apply the test, and the texts constructed by the students were attached to the Moodle Academic platform. To evaluate the clinical conduct described by the students, we used the study by Melo et al. [06], which characterized all the steps to be performed in the Integrated Clinical Planning. We emphasize that, due to ethical precepts, we chose not to make the images and videos of patients available to preserve their integrity.

Data Analysis

The information obtained by the answers of the treatment planning sequence was transcribed, standardized (textual structure and similar terms), and submitted to an analysis of the textual corpus employing the software *Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires* (IRAMUTEQ). For this study, we used lexicographic analysis, Similitude (verifies the occurrence of the words in the text corpus), and Descending Hierarchical Classification (DHC identifies the frequency and semantic connection between the words and the textual structure) [11,12].

Results

Fifty-five students from the course of Dentistry of the UNIFAL-MG participated in this study. The analysis of the textual fragments from the answers of the exams denoted 23,958 occurrences of words described in the textual corpus and 1,139 number of forms. Subsequently, to determine the cut point in the similarity analysis and the dendogram, the following operation was performed: "twice the number of occurrences (NO), divided by the number of forms (NF) (2×NO/NF)", therefore, the cut point established was 42.

The DHC analysis showed that 604 text segments were analyzed with a retention rate of 88.56% of the information described in the text corpus. In addition, five textual classes were constructed and classified according to the content illustrated in Table 2. The information contained in the textual corpus was named as: "Planning and clinical conduct developed by the students of the ICID of the Dentistry course at UNIFAL-MG". The corpus was divided into two sub-corpuses, which therefore originated the first thematic axis (class 1 and 5, named adequacy to the oral environment, which grouped 51.3% of the planning responses) and the second thematic axis (class 2, 3 and 4, named rehabilitation phase, which grouped 48.7% of the responses described by the students). Figure 1 represents the Similitude analysis of the information on the Planning and clinical conduct developed by the students.

Table 2. Planning and clinical conduct developed by the students of the Integrated Clinic I.

Class (%)	Thematic Area	Word	%	p-value
Class I (25%)	Restorative Necessity	Resin	65.5	<0.0001
		Restoration	54	<0.0001
		Resin Veneers	53	<0.0001
		Photopolymerization	72.7	0.00022
		Adhesive	75.3	<0.0001
Class II (12.9%)	Prosthetic Necessity	Crown	32.9	<0.0001
		Ceramic	37.4	<0.0001
		Disilicate	71.5	<0.0001
		Zirconia	83.4	<0.0001
		Installation	38.9	<0.0001
Class III (16.4%)	Necessity for Rehabilitation on Implants	Implant	31.7	<0.0001
		Healing screw	63.1	<0.0001
		Graft	53.6	<0.0001
		Autogenous Graft	77.8	<0.0001
		Osseointegration	70.0	<0.0001
Class IV (19.4%)	Orthodontic Necessity	Bracket	97.6	<0.0001
		Corrective	53.2	<0.0001
		Movement	96.2	<0.0001
		Intrusion	71.7	<0.0001
		Extrusion	69.3	<0.0001
Class V (26.3%)	Planning and Fitting the Oral Environment	Budget	75	0.00164
		Planning	78.2	<0.0001
		Anamnesis	86.5	<0.0001
		Radiography	76.5	<0.0001
		Prophylaxis	81.5	<0.0001

Thus, during the analysis of the treatment planning and clinical conduct developed by the students (Table 1), the main thematic axes that stood out were: restoration, prosthesis, rehabilitation on implant, orthodontics, and adequacy of the oral environment. In the thematic axis "restorative need", which corresponded to 25% of all responses, students preferably used terms "resin" (65.5%), "restoration" (54%), "veneer" (53%), and "adhesive" (75.3%). These terms associated with restorative demand may demonstrate the familiarity of students with these materials and procedures, evidencing their knowledge as exemplified in the speech of the students.

Carry out a composite resin restoration on the incisal edge of tooth 21 (preparation, phosphoric acid application, adhesive application, restoration, and finishing/polishing). Direct resin veneer on tooth 22. Occlusal wear of tooth (Student 16).

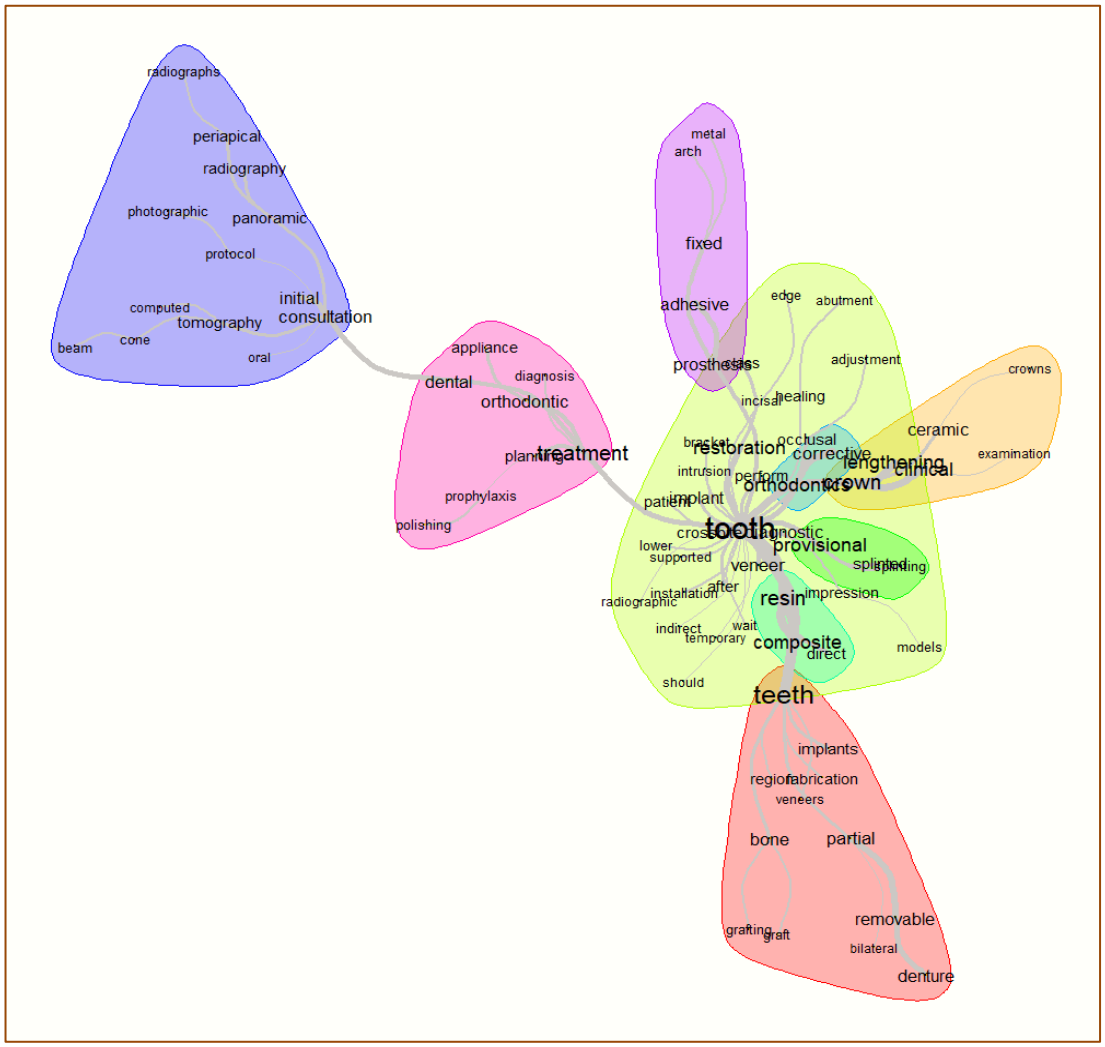

Figure 1. Results of the Similitude analysis of the information on the Planning and clinical conduct developed by the students of the Integrated Clinic I.

Regarding the axis "prosthetic need", which corresponded to 12.9%, the most common words were: "crown" (32.9%), "ceramic" (37.4%), "disilicate" (71.5%), "zirconia" (83.4%), and "installation" (38.9%). In this sense, the variety of words and material options mentioned by the students shows that they had previous knowledge about the necessity of the cases, and more than that, they can elaborate and provide possibilities and options of prosthetic materials, showing clarity about their indications.

Molding of the patient's mouth. Fabrication of study models. Installation of full crown in lithium disilicate or zirconia. Clinical crown augmentation on tooth 21. Restoration of tooth 22 with composite resin. Fabrication of lower partial removable prosthesis for elements 36 and 46 with bilateral clamps (Student 28).

The thematic axis "need for rehabilitation on implant" was in 16.4% of the responses, and the terms: "implant" (31.7%), "graft" (53.6%), "autogenous" (77.8%), and "osseointegration" (70%) were the most cited. It is interesting to note that besides the knowledge and indication of the implant, the students presented previous

knowledge about artifices used in conjunction with the surgical procedure of implant installation in order to maximize results, as well as to understand the process of bone regeneration involved.

> *Explain about the need to place an autogenous bone graft in the regions of teeth 11, 36, and 46. In another session, perform the autogenous bone graft procedure and return with the temporary adhesive prosthesis in the region of tooth 11. Wait 6 months to place the implants in the regions of teeth 11, 36, and 46. After 6 months from the bone graft procedure, install the implants and wait 4 months. After 20 days, take the transfer molding of the implants, make the working models and install provisional crowns on implants 11, 36 and 46 (Student 42).*

As for the thematic axis "orthodontic needs", indicated by 19.4% of the students, the words "bracket" (97.6%), "corrective" (53.2%), "movement" (96.2%), "intrusion" (71.7%) and "extrusion" (69.3%) were the most mentioned.

Finally, the thematic axis "planning and adaptation of the oral environment" was present in 26.3% of the answers and the terms budget (75%), planning (78.2%), anamnesis (86.5%), radiography (76.5%), and prophylaxis (81.5%) suggest that many students understood the importance of prevention and correct diagnosis for the preparation of an individualized and effective treatment plan, which ensures an assertive treatment. On the other hand, only 76.5% of 26.3% of the subject's speeches highlighted the use of imaging exams to aid in diagnosis and subsequent planning, a point that can make it difficult identifying the patient's oral problems and make an accurate diagnosis.

> *Diagnosis and planning for dental treatment. Orthodontic model. Metal orthodontic appliance. Maintenance (12 months) (Student 03).*
>
> *In the first visit, perform the imaging exams (tomography and radiographs), start the adequacy of the oral environment with supragingival scraping (Student 24).*
>
> *Initial dental consultation. Adequacy of the oral environment. Radiographic examination (periapical). Radiographic examination (panoramic). Diagnosis and planning (Student 14).*

Discussion

Although numerous studies have explored the role of Integrated Clinic I Discipline in dental education, this is the first study to qualitatively analyze students' discourse regarding this discipline, including its online version. ICID plays a crucial role in integrating knowledge and practical application, essential aspects for dental education and clinical practice. By providing students with an opportunity to apply theoretical knowledge in clinical settings, ICID facilitates the integration of different disciplines, preparing students to navigate the complexity of the profession. This study examines the importance of ICID, emphasizing the necessity of integrating multidisciplinary knowledge. Additionally, the relevance of innovative teaching methods is discussed, particularly considering the challenges posed by the COVID-19 pandemic, which has necessitated restructuring across all sectors of society to meet new demands.

The ICID aims to treat patients who need to be treated in at least three different specialties and at various levels of complexity. It is essential to integrate different specialties in order to develop effective dental planning [3]. It is worth noting that the students had already studied the basic disciplines in previous periods, but they had not yet had contact with the ICID. For the proposed activity and treatment planning, it was necessary to integrate the previous acquired knowledge to prepare treatment plans for a particular clinical case. These findings were corroborated by Melo et al. [6], who described the importance of multidisciplinary and integrative knowledge for situational planning in ICID.

The essence of this activity was to evaluate the student's ability to prepare a treatment planning and solve clinical cases, considering the knowledge acquired prior to the ICID, so that it was possible to recognize what would be the best method to instruct the student and improve their planning skills. "In pre-clinical education learning is usually based on the disciplines treated individually, without integrating the knowledge needed to make decisions and solve clinical cases" [2]. Moreover, the integration of specialties in a single clinic is the most appropriate way to develop the ability to connect, unify and consolidate the knowledge previously acquired in the various basic disciplines during graduation. Similarly, the study by Ferreira et al. [13] emphasizes the incorporation of disciplines into a single clinic, which is one of the most effective ways to securing learning for the integration of knowledge already acquired.

The necessity for integration of professional disciplines, which at the beginning of the Dentistry course are developed in isolation, allows the student to realize the real complexity of the profession [2]. The assessment of the affinity that the student shows with the disciplines in isolation, besides allowing the agglutination regarding the consolidation of segmented knowledge learned in previous periods, is extremely relevant because it allows the identification and perception of the need for intervention in each specific clinical case. Furthermore, according to Souza et al. [14], the aggregation of all acquired knowledge enables the professional to apply it in a way that improves skills in each case, acquire manual dexterity, and develop teaching-learning abilities with a humanistic approach.

Figure 1 shows the parameters for the construction of the co-occurrence tree through integrated planning in Dentistry. It is denoted that the terms "tooth", "treatment", "prosthesis", "crown", "resin", "consultation", "planning" and "radiographic exams" were the key terms identified in the discourses of the students. Moreover, it was shown that these elements were connected throughout the treatment planning options, thus demonstrating that students presented a coherent and assertive construction regarding their proposed treatment.

Therefore, regarding the integration of basic knowledge in Dentistry, the diagnosis and preparation of a treatment plan that correspond to all the real needs of the patient is indeed the most important step [2]. Given this scenario, it is possible to realize the relevance of higher education institutions in being able to apply innovative and efficient methods in the pre-clinical teaching-learning system, in previous disciplines. This methodology, when well applied, may function as an instrument that favors the learning exercise and better performance of the student in the ICID [6]. According to Ferreira et al. [13], the interdisciplinary aspect of ICID allows students to develop the ability to connect and unify the knowledge already acquired in various basic disciplines during the course.

A partial limitation of this study was the lack of longitudinal studies at the School of Dentistry of Federal University of Alfenas, which hinders a more in-depth analysis of students' performance evolution throughout their education. Additionally, the absence of additional qualitative studies in this area limits our understanding of students' perceptions and experiences regarding integrated discipline. The constraints imposed by COVID-19 also significantly impacted education, making it difficult to adapt the discipline to the online model due to internet access limitations. Furthermore, the lack of comparative data between public and private universities limits our ability to assess the relative effectiveness of this teaching method in clinical practice. These gaps underscore the need for future studies addressing these issues to provide a more comprehensive and in-depth understanding of the impact of ICID on dental education. However, it is important to highlight the innovative potential of this study for the evaluated theme, providing valuable insights and serving as a starting point for future investigations in this area.

Conclusion

The ability to develop different treatment plans was observed in the students enrolled in the Integrated Clinic I Discipline of the School of Dentistry of the Federal University of Alfenas. The treatment plans, based on patient profiles, adapted to each target audience's expectations and budget, were successfully achieved. In addition, the diversity of treatment options demonstrates that students could deepen their knowledge, encompassing several areas of dentistry (periodontics, dental, and oral rehabilitation). Students were able to provide more than one treatment option for each patient. The emergency remote learning model may not have been an aggravating factor regarding student learning in this discipline.

Authors' Contributions

FIDC	https://orcid.org/0000-0002-4688-2059	Conceptualization, Methodology, Formal Analysis and Data Curation.
MMV	https://orcid.org/0000-0003-0013-655X	Data Curation and Writing - Original Draft.
II	https://orcid.org/0000-0002-4046-4913	Writing - Original Draft and Funding Acquisition.
LAF	https://orcid.org/0000-0003-2227-5366	Writing - Review and Editing.
RRB	https://orcid.org/0009-0006-8521-7242	Writing - Review and Editing.
RA	https://orcid.org/0000-0002-6738-7612	Writing - Original Draft.
LSR	https://orcid.org/0000-0002-1928-2568	Conceptualization, Data Curation, Writing - Original Draft, Writing - Review and Editing, Supervision and Funding Acquisition.

All authors declare that they contributed to a critical review of intellectual content and approval of the final version to be published.

Financial Support

None.

Conflict of Interest

The authors declare no conflicts of interest.

Data Availability

The data used to support the findings of this study can be made available upon request to the corresponding author.

References

[1] Brandini DA, Poi WR, Mello MLM, Macedo APA, Panzarini SR, Pedrini D, et al. Social profile of the patients treated at the Discipline of Integrated Clinic of the Dental School of Araçatuba, UNESP, Araçatuba, SP, Brazil. Pesqui Bras Odontopediatria Clín Integr 2008; 8(2): 245-250. https://doi.org/10.4034/1519.0501.2008.0082.0020

[2] Arruda WB, Siviero M, Soares MS, Costa CG, Tortamano IP. Integrated Clinic: the challenge of multidisciplinary integration in dentistry. RFO-UPF 2009; 14(1):51-55. https://doi.org/10.5335/rfo.v14i1.680

[3] Reis SCGB, Santos LB, Leles CR. Undergraduate comprehensive dental care clinic: Users' profiles and dental needs. Rev Odontol Bras Central 2011; 20(52): 46-51. https://doi.org/10.36065/robrac.v20i52.543

[4] Petroucic F, Albuquerque-Júnior RF. Teaching in the discipline of integrated clinics. Rev ABENO 2005; 5(1):60-64. https://doi.org/10.30979/rev.abeno.v5i1.1485

[5] Petroucic F, Júnior RFA, Ferraudo GM. Clinical working and teaching in the discipline of integrated clinic. Rev Cien Cult 2007; 2(2):48-54.

[6] Melo CF, Silva FC, Caldeira FID, Rodriguez LS. Integração multidisciplinar em odontologia: O desafio da clínica integrada. Rev Cienc ITPAC 2021; 14(1):70-79. https://doi.org/10.29327/231587.1.14-8 [In Portuguese].

[7] Valente GSC, Moraes ÉB, Sanchez MCO, Souza DF, Pacheco MCMD. O ensino remoto frente às exigências do contexto de pandemia: Reflexões sobre a prática docente. Res Soc Dev 2020; 9(9):e843998153. https://doi.org/10.33448/rsd-v9i9.8153 [In Portuguese].

[8] Caetano R, Silva AB, Guedes ACCM, Paiva CCND, Ribeiro GDR, Santos DL, et al. Challenges and opportunities for telehealth during the COVID-19 pandemic: ideas on spaces and initiatives in the Brazilian context. Cad Saude Publica 2020; 36(5):e00088920. https://doi.org/10.1590/0102-311x00088920

[9] Caldeira FID, Cardoso B, Carvalho LS, Batista Ferreira E, Pigossi SC, Rodriguez LS. Perception of health-related quality of life, sleep quality, and sleepiness index in an educational environment at a dental school in Southeast Brazil. Eur J Dent Educ 2022; 26(4):794-800. https://doi.org/10.1111/eje.12762

[10] Altman DG, Simera I. A history of the evolution of guidelines for reporting medical research: The long road to the EQUATOR Network. J R Soc Med 2016; 109(2):67-77. https://doi.org/10.1177/0141076815625599

[11] Souza MAR, Wall ML, Thuler ACMC, Lowen IMV, Peres AM. The use of IRAMUTEQ software for data analysis in qualitative research. Rev Esc Enferm USP 2018; 52:e03353. https://doi.org/10.1590/S1980-220X2017015003353

[12] Camargo BV, Justo AM. IRAMUTEQ: a free software for analysis of textual data. Temas Psicol 2013; 21(2):513-518. https://doi.org/10.9788/TP2013.2-16

[13] Ferreira NP, Dantas TS, Sena-Filho M, Rocha DG. et al. Integrated clinic and curriculum change: clinical performance in the perspective of integrality. Pesqui Bras Odontopediatria Clin Integr 2012; 12 (1):33-39. https://doi.org/10.4034/PBOCI.2012.121.05

[14] Souza PG, Silva MB, Braga AT, Siqueira TP, Gonçalves LC, Soares PV. Evaluation of the quality of care offered in the Integrated Clinic of the Federal University of Uberlândia. Rev Odontol Bras Central 2014 23:140-145. https://doi.org/10.36065/robrac.v23i66.888