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Profile of dentistry students in the use of Instagram as a mobile and ubiquitous learning tool: a cross-sectional study

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ABSTRACT

Objective: Characterizing the profile of Instagram use as a ubiquitous learning tool by dentistry students from public and private teaching institutions. **Method:** This is a cross-sectional, qualitative-quantitative, prospective, exploratory study, using a structured questionnaire, on the use of Instagram as a learning tool by students of a Public Higher Education Institution (Federal University of Uberlândia) and a Private Higher Education one (Centro Universitário de Patos de Minas) with students from the first to the last year of the Dentistry course. Statistical analyzes were performed using the Bioestat software version 5.3, and the significance level was equal to 5% or ($p=0.05$). **Result:** The sociodemographic characteristics revealed that most dentistry students are women, young and white. The frequency of cell phone use is an average of 5 hours a day (38.2%). The most accessed social network is Instagram (33.5%) and most students find it easy (44.7%) or very easy (44.1%) to access content about oral health on social networks. Most respondents are concerned with viewing content with scientific evidence (44.4%). **Conclusion:** It is demonstrated that Instagram can be a useful tool for the teaching-learning process since students report its use for academic activities and that professors should encourage the use of social media, even after the return to the face-to-face learning method.

KEYWORDS

Information technology. Dentistry. Social media. Learning methods.

Perfil dos estudantes de Odontologia no uso do Instagram como ferramenta de aprendizagem móvel e ubíqua: estudo transversal

RESUMO

Objetivo: Caracterizar o perfil de uso do Instagram como ferramenta de aprendizagem ubíqua por parte dos estudantes de Odontologia de instituições de ensino públicas e privadas. **Método:** Trata-se de um estudo transversal, quali-quantitativo, prospectivo, exploratório, utilizando um questionário estruturado, sobre o uso do Instagram como ferramenta de aprendizagem por estudantes de uma Instituição de Ensino Superior Pública (Universidade Federal de Uberlândia) e uma Instituição de Ensino Superior Privada (Centro Universitário de Patos de Minas) com estudantes do primeiro ao último ano do curso de Odontologia. As análises estatísticas foram realizadas através do software Bioestat versão 5.3, e o nível de significância foi igual 5% ou ($p=0,05$). **Resultado:** As características sociodemográficas revelaram que a maioria dos estudantes de Odontologia são mulheres, jovens e brancas. A frequência do uso do celular é média de 5 horas diárias (38,2%). A rede mais acessada é o Instagram (33,5%) e a maioria dos estudantes tem facilidade (44,7%) ou muita facilidade (44,1%) em acessar conteúdos sobre saúde bucal nas redes sociais. A maior parte dos entrevistados se preocupa em visualizar conteúdos com evidência científica (44,4%). **Conclusão:** Demonstra-se que o Instagram pode ser uma ferramenta útil para o processo ensino-aprendizagem, já que estudantes relatam seu uso para atividades acadêmicas e que professores devem estimular o uso dessa mídia social, mesmo após o retorno do regime presencial.

PALAVRAS-CHAVE

Tecnologia da Informação. Redes sociais. Odontologia. Metodologias de aprendizagem.

Perfil del uso de Instagram como herramienta de aprendizaje móvil y ubicuo por parte de estudiantes de odontología: estudio transversal

RESUMEN

Objetivo: Caracterizar el perfil de uso de Instagram como herramienta de aprendizaje por parte de los estudiantes de Odontología de instituciones de enseñanza públicas y privadas. **Método:** Se trata de un estudio transversal, cuali-cuantitativo, prospectivo y exploratorio, mediante un cuestionario estructurado, sobre el uso de Instagram como herramienta de aprendizaje por parte de los estudiantes de una IES Pública (Universidade Federal de Uberlândia) y de una IES Privada (Centro Universitário de Patos de Minas) con alumnos del primer al último año del curso de Odontología. Los análisis estadísticos se realizaron con el programa informático Bioestat versión 5.3, y el nivel de significación fue del 5% o ($p=0,05$). **Resultados:** Las características sociodemográficas revelaron que los estudiantes de odontología son mujeres, jóvenes y de raza blanca. La frecuencia de uso del teléfono móvil es de una media de 5 horas diarias (38,2%). La red a la que más se accede es Instagram (33,5%) y a la mayoría de los estudiantes les resulta fácil (44,7%) o muy fácil (44,1%) acceder a contenidos sobre salud bucodental en las redes sociales. La mayoría de los encuestados se preocupan por ver contenidos con evidencia científica (44,4%). **Conclusión:** Se demuestra que Instagram puede ser una herramienta útil para el proceso de enseñanza-aprendizaje, ya que los estudiantes informan de su uso para las actividades académicas y que los profesores deben fomentar el uso de este medio social, incluso después de la vuelta del régimen presencial.

PALABRAS CLAVE

Tecnología de la información. Odontología. Medios sociales. Método de aprendizaje.

Introduction

A global crisis caused by the new coronavirus (SARS-CoV-2) has shaken the world, directly affecting health, economy, communication, and education. Several countries were affected, which, in 2020, was one of the biggest health challenges of the decade (FARIA *et al.*, 2020). COVID-19 has drastically modified health services, making the discussion on adapting innovative work methods and tools to continue social activities mandatory, to significantly reduce the possibility of infection (FERNANDEZ *et al.*, 2020; GIUDICE, 2020). Amid this, educational instruments were planned and prepared to help the population, concerning guidelines, care, and forms of prevention and contagion of the new coronavirus (FARIA *et al.*, 2020).

Society has uninterrupted access to information from different fields, especially regarding digital resources that, today, are entirely linked to the daily life of the population (FALEIRO; SALVAGO, 2018). These resources favored the execution of numerous activities during the period of social isolation caused by the coronavirus. In undergraduate dentistry courses, several activities had to be suspended, which led to the need for other teaching methods, such as remote learning and the direct application of digital tools (FERNANDEZ *et al.*, 2020; GUSSO *et al.*, 2020; QUINN *et al.*, 2020; SOUZA *et al.*, 2020). In this context, understanding technological advances from the 21st century becomes relevant, such as the Fourth Industrial Revolution or Industry 4.0, which focused on technological innovations and experiences in the teaching-learning process (BALSAN; FRANZ; SOUZA, 2019). Additionally, the industry has increased the levels of qualification and learning, giving rise to what we now call Education 4.0, focused on innovation and maximizing the use of information, the internet, and technology in education, which, amid social distancing, allows for continuity in education (ANGGRAENI, 2018; SOUZA *et al.*, 2019).

This new learning method must be focused on the *maker* culture model based on "*Learning by doing*", so students can learn on their own and, consequently, change the scenario of traditional teaching, facilitating the use of technologies and favoring digital education. In addition, terms such as ubiquitous learning have become frequent in areas outside education careers and, according to Santaella (2010), this term corresponds to the use of technological tools at any time and place with educational purposes and favoring the teaching-learning process. Associated with mobile learning, which with the advancement of technology has become a possible reality, the use of applications beyond mere distraction has been increasingly frequent by students to favor their study routine and, consequently, their learning (BALSAN; FRANZ; SOUZA, 2019; SOUZA *et al.*, 2019).

Currently, digital information and communication technologies (DICTs) generate a great impact on remote learning, contributing to the academic training of dental surgeons. These technologies allow numerous innovations, in addition to developing new ways of learning; being guided by the use of social media such as Instagram, which help in communication, improve creativity, development of ideas and technical skills; and allow increased access to

DICTs that facilitate the promotion of knowledge and education in digital health (FALEIRO; SALVAGO, 2018; TANTAWI *et al.*, 2019; GUSSO *et al.*, 2020; RAJEH *et al.*, 2020). It is suggested that these digital resources enable the enrichment of teaching methods along with the role of the professor, besides allowing students to gain greater autonomy when seeking and selecting information and improving self-management of knowledge. Estimates reveal that the number of Instagram users could reach 1 billion in the next few years (VAALA *et al.*, 2015; BRAZ *et al.*, 2018; TANTAWI *et al.*, 2019; SANTOS *et al.*, 2016).

The use of digital tools supporting traditional teaching allows numerous advantages, which led teaching institutions (TIs) to innovate in teaching and combat misinformation regarding current relevant issues, demanding the delivery of quality information as well as oral health information supported by scientific evidence (SOUZA *et al.*, 2019; XAVIER *et al.*, 2020; FALEIRO; SALVAGO, 2018). Therefore, several digital tools were used, including Instagram, which made it possible to keep conducting activities guided by practice based on scientific evidence and associated with the application and evaluation of extracurricular activities (ZIMMER *et al.*, 2018; ARAÚJO *et al.*, 2020; MONTANDON *et al.*, 2020; XAVIER *et al.*, 2020). In this context, the present study aims to characterize the profile of the use of Instagram as a ubiquitous and mobile learning tool by dentistry students from two institutions, one public and the other from the private sector, in the state of Minas Gerais.

Materials and methods

The present study was approved by the Research Ethics Committee under the number CAAE 43986721.7.0000.5549. This is an exploratory, prospective, quali-quantitative, cross-sectional, multicenter study, conducted from April to September in the year 2021, with students from the Dentistry Course of the Centro Universitário de Patos de Minas - UNIPAM and the Faculty of Dentistry of the Federal University of Uberlândia. The sample comprised 152 participants duly enrolled and following classes at the two TIs. Undergraduate students between the first and last year of Dentistry, over 18 years old, and had an Instagram account were included in the research. We have excluded those who were not willing to participate, were not familiar with the Google Forms tool, and studied during the night shift, due to the absence of classes in this shift at the institutions participating in the research.

A structured questionnaire, with 17 questions, was applied remotely to students from the first to last year of the Dentistry courses of the participating institutions. It was prepared using Google Forms by the authors themselves, addressing sociodemographic criteria in objective questions about the use of Instagram by dentistry students, the questions were elaborated from the need for answers in the objectives of this study, i.e., information necessary to establish the use of Instagram as a learning tool. The research instrument was sent to the course coordinator of each institution, that sent it via e-mails and WhatsApp messages according to their lists, which were not made available to researchers in agreement with the Data Protection Law. Students answered the questionnaire after reading and agreeing with the

consent form and, of the respondents, all who started by reading the consent form advanced to the next page containing the questions. There were no refusals to participate.

After data collection, they were analyzed using descriptive statistics and the study groups were categorized with frequency tables for qualitative variables. The nonparametric hypothesis G-test for independence was used to estimate the association between different categories of data, such as type of institution x family income, ethnicity x income, type of institution x ease of accessing digital content, type of TI x search of referenced information, income x ease of accessing digital content, ethnicity x type of institution. This is a non-parametric test for two independent samples, similar to the Chi-squared test for categorical data. The scores were measured at the nominal or ordinal level, and the samples presented two or more categories arranged in $l \times c$ contingency tables. The degrees of freedom are calculated as follows: $(l - 1) \times (c - 1)$. In the entire study, the significance level was 5%, and the analyzes were performed using the Bioestat software, version 5.

Results

In Table 1, we can observe the descriptive statistics of the data obtained in this study, presented in absolute and relative frequency, and categorized by groups. Of the students enrolled in both institutions, which comprised a universe of 400 students attending from the first to the last year of the undergraduate course, 152 answered the questionnaire, which was compatible with the sample previously calculated. The sociodemographic characteristics revealed that most dentistry students are women, young and white. More than half of the respondents are white, 65.1%, which reinforces one of the sociodemographic characteristics of dental students. Of the total number of respondents, about 62.5% are from private TIs. No relationship was observed between type of teaching institution and family income ($p=0.5063$), in this study.

Table 1- Frequency of parameters analyzed in dentistry pages.

Description of the analyzed parameters	Classes of the analyzed parameters	Frequency % (n)
Age group	18 and 19 years old	13.8 (21)
	20 to 29 years old	82.2 (125)
	30 to 39 years old	3.3 (5)
	40 to 49 years old	0.7 (1)
Gender	Female	79.6 (121)
	Male	20.4 (31)
Ethnicity	Yellow	4.6 (7)
	White	65.1 (99)
	Mixed-race	25.7 (39)
	Black	4.6 (7)
Period / What is the phase of the	First period	14.5 (22)

undergraduate course you are currently studying?	Second period	3.9 (6)
	Third period	4.6 (7)
	Fourth period	9.9 (15)
	Fifth period	12.5 (19)
	Sixth period	3.9 (6)
	Seventh period	4.6 (7)
	Eighth period	0.0 (0)
	Ninth period	31.6 (48)
	Tenth period	14.5 (22)
	How often do you use your cell phone daily?	1 hour
2 hours		7.2 (11)
3 hours		16.4 (25)
4 hours		20.4 (31)
5 hours		14.5 (22)
More than 5 hours		38.2 (58)
What networks and social media do you have access to?	Instagram	33.5 (150)
	Facebook	19.2 (86)
	Linkedin	3.3 (15)
	YouTube	29.5 (132)
	TikTok	14.5 (65)
How do you judge how easy it is to access oral health content on social networks and digital media?	I don't think it's easy or difficult.	9.9 (15)
	It's difficult for me	1.3 (2)
	It's easy for me	44.7 (68)
	It's very easy for me	44.1 (67)
What is the family income in your home?	Up to 1 salary	3.3 (5)
	Between 1 and 3 salaries	31.6 (48)
	Between 4 and 6 salaries	32.9 (50)
	Between 6 and 9 salaries	15.1 (23)
	More than 10 salaries	17.1 (26)
Type of teaching institution	Private	62.5 (95)
	Public	37.5 (57)
Do you follow Dentistry pages on Instagram?	Yes	97.4 (148)
	No	2.6 (4)
How often do you access Dentistry pages to search or review content?	Often	32.2 (49)
	Never	3.9 (6)
	Rarely	19.1 (29)
	Regularly	34.9 (53)
	Always	9.9 (15)
Are you concerned about viewing content on pages whose publications present scientific evidence?	Often	27.6 (42)
	Never	1.3 (2)
	Rarely	9.9 (15)

	Regularly	19.7 (30)
	Always	41.4 (63)
	Often	23.0 (35)
Is the content on Instagram more interesting if it is followed by references and sources?	Never	1.3 (2)
	Rarely	9.2 (14)
	Regularly	9.2 (14)
	Always	57.2 (87)
Do you believe that your learning can be favored by the user-friendliness and language used on Instagram?	Yes	94.7 (144)
	No	5.3 (8)
Do your professors use Instagram for teaching-learning actions?	Often	24.3 (37)
	Never	11.8 (18)
	Rarely	25.7 (39)
	Regularly	34.2 (52)
	Always	3.9 (6)
Do you believe that, if professors use and promote Instagram, this could contribute to your learning?	Yes	91.4 (139)
	No	8.6 (13)

Source: Research data, 2021.

Research data show that when ethnicity and family income are associated, it was found that white respondents have a higher income than the other groups ($p=0.0471$). Ethnic differences are reflected in the inequality of income distribution, as white students have more favorable socioeconomic conditions (Table 2).

Table 2- Analysis of the dependence between ethnicity and income of dentistry students.

	<i>Yellow</i>	<i>White</i>	<i>Mixed-race</i>	<i>Black</i>
<i>Up to 1 salary</i>	0	1	4	0
<i>Between 1 and 3</i>	5	32	7	4
<i>Between 4 and 6</i>	1	33	15	1
<i>Between 6 and 9</i>	0	14	7	2
<i>> 10</i>	1	19	6	0
	Results		Results	
<i>Contingency Table =</i>	5 x 4		<i>Contingency Table =</i>	5 x 4
<i>Chi-squared =</i>	20.619		<i>Sum of categories =</i>	152
<i>Degrees of freedom =</i>	12		<i>Degrees of freedom =</i>	12

$(p) =$	0.0562	G-Test =	21.2316
		$(p) =$	0.0471
		G-Test (Williams) =	17.5441
		$(p) =$	0.1303

Source: Research data, 2021

Approximately 38.2% of respondents spend more than 5 hours using social networks. Most students find it very easy (44.7%) or easy (44.1%) to access oral health content on social networks (Table 1). However, no relationship was observed between the type of TI and ease of accessing content ($p= 0.9154$), which reflects that, regardless of the institution, students find it easy. In Table 3, the remarkable association between family income and ease of access is shown, in which families with 1 to 6 salaries find it easy or very easy to access content ($p= 0.0171$).

Table 3- Analysis of the dependence between income and the ease of accessing content on social networks.

	<i>Neutral</i>	<i>Difficult</i>	<i>Easy</i>	<i>Very easy</i>
<i>Up to 1 salary</i>	1	0	4	0
<i>Between 1 and 3</i>	1	2	25	20
<i>Between 4 and 6</i>	9	0	16	25
<i>Between 6 and 9</i>	3	0	8	12
<i>> 10</i>	1	0	16	10
	Results		Results	
<i>Contingency Table =</i>	5 x 4		Contingency Table = 5 x 4	
<i>Chi-squared =</i>	21.365		Sum of categories = 153	
<i>Degrees of freedom =</i>	12		Degrees of freedom = 12	
$(p) =$	0.0453		G-Test = 24.5522	
			$(p) = 0.0171$	
			G-Test (Williams) = 17.6078	
			$(p) = 0.1281$	

Source: Research data, 2021

When questioned about which social networks and media are most accessed, Instagram is the most accessed platform (33.5%), followed by Youtube (29.5%) and Facebook (19.2%). They demonstrated no relationship with ethnicity ($p=0.6662$), which exemplifies that skin color is not linked to the use or not of social networks, despite socioeconomic differences. Of the total sample, 97.4% of respondents reported following Instagram pages in their daily lives. Of this percentage, 34.9% of respondents access it regularly. These answers allowed the verification of what type of institution influences the frequency of access to these pages to search or review content. Therefore, we have observed that students from private TIs access this type of page more often.

It was possible to verify that 41.4% of respondents are always concerned about visiting pages that have publications with scientific evidence. The association between the type of institution and the concern with content accompanied by scientific evidence was not observed ($p=0.8538$), showing that students from both institutions have this concern. Regarding the references and sources of the content, more than half of the students (57.2%) are more interested in referenced publications when using Instagram. In Table 4, it is demonstrated that there was significance between the type of institution and the use of references and sources in Instagram publications since, in the vast majority, students from private institutions always think content becomes more interesting when accompanied by scientific references/evidence ($p. =0.0061$).

Table 4- Analysis of the dependence between the type of Teaching Institution and the search for referenced publications

	<i>Private</i>	<i>Public</i>
<i>Often</i>	20	15
<i>Never</i>	2	0
<i>Rarely</i>	3	11
<i>Regularly</i>	9	5
<i>Always</i>	61	26

	Results		Results
<i>Contingency Table =</i>	5 x 2	<i>Contingency Table =</i>	5 x 2
<i>Chi-squared =</i>	13.876	<i>Sum of categories =</i>	152
<i>Degrees of freedom =</i>	4	<i>Degrees of freedom =</i>	4
<i>(p) =</i>	0.0077	<i>G-Test =</i>	14.3939
		<i>(p) =</i>	0.0061
		<i>G-Test (Williams) =</i>	
	13.1805	<i>(p) =</i>	0.0104

Source: Research data, 2021

Most participants (94.7%) believe that learning can be favored by the user-friendliness and language of **Instagram** publications, regardless of the type of institution.

Discussion

The results clearly showed the profile of dentistry students regarding their social characteristics and perceptions on the use of digital tools for dental education. To propose innovations or changes in andragogy practices, knowledge of student behavior is essential so that the actions generate significant and actual learning, meeting the interests and demands presented by this target audience.

The student profile found in this study shows the predominance of female undergraduates in Dentistry courses, exemplifying the process of feminization of the profession. This increase is due to the number of women in the population and their progressive integration into the higher education system (SALES, 2020), corroborating findings by other authors (LATREILLE *et al.*, 2015; SANTOS *et al.*, 2015; SOUZA *et al.*, 2015; GRANJA *et al.*, 2016; MENDES *et al.*, 2018; ECHEVERRIA *et al.*, 2020). A profile of younger students in higher education could be evidenced in this research since 82.2% of participants are between 20 and 29 years old. This is similar to the study by Latreille *et al.* (2015) in which 65.4% of subjects were between 21 and 25 years old, and the study by the Faculty of Dentistry of the University of São Paulo (FOUSP - São Paulo, Brazil), with a prevalence of students between 17 and 27 years of age (SANTOS *et al.*, 2015).

Most of the Dentistry students in this study have a family income between 1 and 6 minimum wages, which agrees with the study by Granja *et al.* (2016) in which the predominant family income was 3 to 6 minimum wages (40.8%) and diverges from that by Mendes *et al.* (2018), in which most of the income was above BRL 8,800.00 (54.0%). The higher income of students is associated with an old point of view on Dentistry, which was seen as an elitist profession; this might even be based on the need to acquire dental materials and tools during the undergraduate course. Professional work in private offices is still a reality in the Dentistry job market. In this context, financial support is essential. Despite this, it has been noticed in recent times, a greater demand for professionals by the public sector (PINHEIRO; NORO, 2016; MARTINS; DIAS; LIMA, 2018).

This is a multicenter study, in which two teaching institutions were chosen, a public and a private one. According to official documents and works, such as that of Morita *et al.* (2021), a greater rigor in the selection process for studying in public TIs could influence student performance and, consequently, their choosing and acceptability of innovations and the proper use of digital tools. Therefore, the division into two levels, for public and private TI students is relevant. Most of the participants are from a private institution (62.5%). According to the last higher education census by the Anísio Teixeira National Institute of Educational Studies and Research (Inep) in 2019, about 88.4% of higher education institutions are private (BRASIL, 2020, MORITA *et al.*, 2021).

Social networks are currently gaining importance as a means of entertainment and as a potential tool for teaching, enabling the discussion of relevant topics, dissemination of information, and sharing of collective knowledge (LOPES; PEREIRA; SILVA, 2016). The use of *smartphones* is currently more accessible and comfortable for users and, as an

example, this study reports that 38.2% of the participants use their cell phones for more than 5 hours a day. This figure is consistent with a majority worldwide, where today, the amount of time people spend online varies from country to country. Given this, internet users in the Philippines currently spend an average of 9 hours and 45 minutes online per day, compared to Japan with 4 hours and 22 minutes per day, so our sample falls within a global variable, with an average considered high (DIGITAL 2020, 2020; KEMP, 2020).

The familiarity of young people with the digital world is expressed by a large number of young Internet users in the world and students who master technology and the use of digital tools. This situation clearly presents itself as a facilitator of the process of inserting tools in teaching that may be used at a distance, synchronously, or asynchronously (FERREIRA; MOTA, 2014; FAROOQ *et al.*, 2020). In this study, the ease of accessing oral health content on social media and networks was between easy (44.7%) and very easy (44.1%), showing that most students find it easy to access digital tools, and even surprisingly, families with lower average incomes (1 to 3 minimum wages) find it easy or very easy to do it, which suggests improvements, without, however, definitively solving the problems in the process of democratization of access to social media and consequently to the Internet. This information goes against great discussions for implementing remote and hybrid learning because of the social inequality still present in Brazil.

Faced with the COVID-19 pandemic, dental education suddenly suffered from the challenges imposed by social isolation (TOMAZ; SILVA; BORGES, 2021). In this scenario, the use of digital tools was suggested as a way to continue the teaching-learning process, implementing different types of technological resources and innovative strategies (CHANG *et al.*, 2020). In this way, social networks and digital platforms reached their peaks of use during the pandemic, reinvented themselves, and allowed greater access to new needs. Although user-friendliness favors digital education, in times of crisis, there is evidence of large gaps in social inequality. In the pandemic, the level of inequality was evident when it exposed a large number of students with no access to cell phones, computers, and even the internet. In addition, the quality of the connection also becomes a limiting factor for access (TOKARNIA, 2020; SOUZA, 2021).

The social network with the greatest number of accesses in this study is Instagram, comprising 33.5% of the sample, followed by YouTube (29.5%) and Facebook (19.2%). This data diverges from a study conducted on social media usage statistics in the United Arab Emirates (2021) where YouTube had first place, with 8.65 million users; Facebook was second, with 7.77 million; and Instagram was third, with 6.68 million (UAE, 2021).

Regarding Instagram, about 97.4% of students report following Dentistry pages, and approximately, 34.9% of them regularly access them as a way of searching and reviewing content, which ends up expressing that social networks gained importance not only as a means of entertainment but as a form of teaching-learning and the use of ICTs (LOPES; PEREIRA; SILVA, 2016). On Instagram pages, there are several types of information sources, and because of this, 41.4% of respondents are concerned with checking whether the contents of these pages have scientific evidence. However, in the study by Lopes *et al.* (2016)

only 63% of students could identify the source or detect the reliability of the pages accessed, given this, it is necessary for students to be aware of these limitations and seek the most reliable information possible in this learning tool. Most respondents are concerned about the level of scientific evidence of publications, and for that, specific parameters such as *the Grading of Recommendations Assessment, Developing and Evaluation (GRADE)* method and the Oxford evidence levels, that assess the quality of evidence and its respective level, allow greater reliability on the information received (GALVÃO; PEREIRA, 2015; BROZEK *et al.*, 2020). Another important point asked during the research was whether, when using Instagram, the references accompanying the content make it more interesting. The most intriguing is that more than half of the students (57.2%) are concerned with the referenced publications, which highlights another characteristic of the profile of the Dentistry student.

Currently, Instagram is seen as a network that stands out for its great user-friendliness and for prioritizing the sharing of photos and videos. In this survey, about 94.7% of respondents believe that this factor and the language register used in the application favor learning.

During the pandemic, professors had to rethink their processes, focusing on the use of alternative means to continue dental education, mainly regarding the use of information and communication technologies (ICTs) (SILUS; FONSECA; JESUS, 2020.; SILVA *et al.*, 2021). Professors already use digital tools to establish actions based on andragogy, which can be explained by the ease of use of the platform to disseminate new information, which is a possibility, and, interestingly, actions are also implemented in digital media to further dynamize the dental teaching process (CHANG *et al.*, 2020; OLIVEIRA, 2020).

Although there are numerous advantages to the use of social media, such as Instagram, in educational processes, there are limitations and challenges to be overcome. Respect for professional ethics, in this case, regulated by the Federal Council of Dentistry, is not always maintained when thinking about academic content, which may generate a gap in the construction of knowledge for students and be a negative example for professionals still in training; e.g., the dissemination of images and often confidential information regarding patients (MARTORELL, 2017).

In addition, scientific evidence is not always properly demonstrated, or even used, when considering adequate levels needed for professional practice, which is extremely necessary for the health area. The encouragement for the use of Instagram by students as a source of content must be done judiciously, combined with common and critical senses by both students and professors (DOUGLAS *et al.*, 2019).

Despite presenting important results, the present study has limitations, such as the need to obtain data from the students themselves, since they may be suggested to answer the questions in a biased way that contemplates the good use of social networks, given the generation of digital natives that made up the sample. Digital media enhance teaching and provide new methods, tools, and strategies for teaching and learning. During the pandemic, the importance of continuing the educational processes combined with remote learning under

the supervision of teachers was clear, as this union provides new ways of thinking about the teaching-learning process, expands the perspective on it, and brings information to the digital world, a place that students are already so used to inhabit (REIS; SILVA; SILVA, 2020).

Conclusion

With all this in mind, we could observe that Instagram is the preferred social network for dentistry students from both TIs evaluated in this study. The focus is on the search for publications that present clear references, especially among students from private TIs, and students have accessed this social network as a ubiquitous and mobile learning tool, given their user-friendliness. Although social gaps can still be observed, which is demonstrated by the elite profile of Dentistry students, it is also demonstrated that Instagram may be a useful tool for the teaching-learning process and that professors should encourage its use, even after the return to face-to-face learning. Further studies are needed given the increasingly frequent entry of the generation of digital natives into undergraduate courses in Dentistry and their consequent ease of use of social networks, making these practices recurrent in the context of teaching Dentistry.

Nevertheless, face-to-face learning is still the gold standard for the teaching-learning process, given the range of possibilities for the development of skills and competencies that go beyond the construction of solid learning, such as the ability for having interpersonal relationships and establishing contact networks. In this context, digital tools may complement, but not replace, educational processes, since, due to their ubiquity, they adapt to the reality of digital natives but lack constant surveillance and regulation regarding ethical factors and the shared content itself.

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