KATHOLIEKE UNIVERSITEIT LEUVEN

FACULTEIT GENEESKUNDE

DEPT. MONDGEZONDHEIDSWETENSCHAPPEN

Use of social media e-learning by dental students

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Masterpaper ingediend
tot het behalen van het
Diploma van Master
in de Tandheelkunde
door

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Leuven academiejaar 2022 – 2023

USE OF SOCIAL MEDIA E-LEARNING BY DENTAL STUDENTS

ABSTRACT

Background: The development of digital content on social media may become even more essential to the education of students. Research has shown that medical students feel inadequately prepared and responsible for treating their patients, making them more inclined to use extracurricular online learning (OL).

Objective: This study aimed to investigate the usage of OL among dental students. Comparison is made between students during the bachelor's phase, master's phase and specialization phase.

Methods: A self-created questionnaire were distributed online to dental students. Gender and academic degree were gathered for each participant, as well as their experience and interest in extra-curricular OL. Also, the platforms they utilized for OL were examined.

Results: The questionnaire was fully completed by 314 students. 86,2% of all students use OL for educational purposes. A significant correlation was found between education level and the reasons for use of OL. Also for the correlation between education level and hours spent on OL, added value to their studies, recommendation to other students, better exam results (self-reported) and greater insight in clinical actions/topics significant results were found ($p<0.001$). A correlation was found when comparing the education level and whether they found the information (of video's) on platforms such as Youtube and Facebook reliable and evidence-based.

Conclusion: It can be concluded that the majority of students use OL, but they lack reliable information on social media and feel there is a need for monitoring correctness on these platforms.

Keywords: dental education, online learning, social media, e-learning, digital learning

GEBRUIK VAN SOCIAL MEDIA E-LEARNING DOOR STUDENTEN TANDHEELKUNDE

ABSTRACT

Achtergrond: De ontwikkeling van digitale content op sociale media kan nog essentiëler worden voor het onderwijs aan studenten. Onderzoek heeft aangetoond dat studenten die een medische opleiding volgen onvoldoende voorbereid zijn en zich onvoldoende verantwoordelijk voelen voor de behandeling van hun patiënten, waardoor ze meer geneigd zijn gebruik te maken van extra-curriculair online leren (OL).

Doelstelling: Deze studie had als doel het gebruik van OL onder studenten tandheelkunde te onderzoeken. Er werd een vergelijking gemaakt tussen studenten in de bachelorfase, masterfase en specialisatiefase.

Methoden: Een zelf opgestelde vragenlijst werd online verspreid onder studenten tandheelkunde. Geslacht en opleidingsniveau werden verzameld voor elke deelnemer, evenals hun ervaring en interesse in extra-curriculair OL. Ook werd er onderzocht welke platforms zij gebruikten voor OL.

Resultaten: De vragenlijst werd volledig ingevuld door 314 studenten. 86,2% van alle studenten gebruikten OL voor educatieve doeleinden. Er werd een significante correlatie gevonden tussen opleidingsniveau en de redenen voor het gebruik van OL. Ook voor de correlatie tussen opleidingsniveau en het aantal uren besteed aan OL, toegevoegde waarde aan hun studie, aanbeveling aan andere studenten, betere examenresultaten (zelf gerapporteerd), en meer inzicht in klinische handelingen/onderwerpen werden significante resulaten gevonden ($p<0.001$). Ook werd er een correlatie gevonden bij het vergelijken van het opleidingsniveau en of zij de informatie (van video's) op platforms als Youtube en Facebook betrouwbaar en evidence-based vonden.

Conclusie: Er kan geconcludeerd worden dat de meerderheid van de studenten OL gebruikt, maar ze vinden dat er een gebrek is aan betrouwbare informatie op sociale media en dat er behoefte is aan controle op de correctheid van deze platforms.

Trefwoorden: tandheelkundig onderwijs, online leren, sociale media, e-learning, digitaal leren

INTRODUCTION

Students now live in a fast evolving digital world[1]. This digital world may become even more essential to the education of students, as the Covid-19 pandemic forced educational institutions to shift to online education[2].

In recent decades, there has been a shift in education from traditional forms of education to other media using online learning[3]. Students see online learning as an addition to traditional education rather than as a replacement for it, as part of a blending-learning approach to education[4].

Online learning can be described as the delivery, support and enhancement of learning and teaching through the use of electronic technology and media. It additionally includes communication between students and educators using online content[3].

There is evidence that e-learning is more efficient because learners acquire knowledge, skills and attitudes faster than in traditional instructor-led methods[4]. Students have also demonstrated that they are better able to retain and apply the material when provided online. This efficiency is probably to result in increased performance and motivation. Online learning provides students with effective and easy access to a large amount of information[4]. Furthermore, medical students feel inadequately prepared and responsible for treating their patients[5], making them more likely to use OL.

Platforms commonly used by students are Youtube, Instagram and Facebook. It is not limited in time and space which makes the platform very accessible[1]. Youtube provides the opportunity for feedback and interaction among users[6]. This creates both greater student engagement in learning and more critical awareness, thus students become automatically more inclined to learn deeply[1].

Despite the many benefits of these platforms, there are some limitations to its use. Content may be misleading, inaccurate or biased[1]. Often there is almost no regulation of content. As there is an overabundance of Youtube videos, students can be overwhelmed and unsure where to start looking for certain content. Some students who utilize Youtube to learn about clinical procedures are uncertain about the scientific basis and correctness of the videos[7 8]. Until now, no peer-reviewed evaluation process exists for educational videos on social media. Very little has been mapped on the use of this OL among dental students. This study aims to get an insight into OL use among dental students. Moving away from certified scientific platforms to social media platforms where (para)medical videos are published. In particular, we compare students during the bachelor's phase, master's phase and specialization phase. The experiences of the participants and the type of platforms they used, were investigated.

METHODS

Study design and participant inclusion

A self-administered cross-sectional survey was conducted from September to November, 2022. The inclusion criteria for this study were Dutch speaking students enrolled in 'Bachelor of Dentistry', 'Master of Dentistry' and 'Master of Specialist Oral Care' at the University of Leuven during the academic year 2021-2022. Excluded from the study were students enrolled in the first bachelor year during the 2022-2023 academic year because they have only just started their studies. Participants provided informed consent prior to answering the questionnaire.

Data collection

After approval by the local ethics committee (MP019596), potential participants were contacted through the Facebook groups of the graduating years and through their institutional email to complete the questionnaire. A QR-code with the link to the questionnaire was also published in the student newspaper to reach more peers.

Questionnaire

Participation in the study by completing the questionnaire took less than 5 minutes.

The questionnaire (annex B and C) was completed through Qualtrics (Qualtrics, Provo, Utah, USA), which is linked to the educational platform provided by the university of Leuven (KU Leuven and UZ Leuven).

The questionnaire probed student's epidemiological data, in particular their current level of education, gender and specialization if applicable. Furthermore, the survey included more specific questions on whether or not students use social media and OL during their study, mainly using multiple-choice questions. The last part of the survey contained some specific questions that probe the positives and negatives of using social media for OL during their training, using a Likert scale with a possible score from 0 (totally disagree) to 5 (totally agree). This allowed difficult-to-quantify data to be surveyed.

Statistical analysis

At the end of the study period, the data were downloaded from Qualtrics and entered for statistical analysis into the program SPSS 28.0.1.1 (14) (SPSS Inc. Chicago, IL, VS).

Imputation was applied to fill in the missing data.

Multiple response sets were used for the questions where respondents were allowed to indicate more than one answer in a single question.

For this study, students from the bachelor's phase, master's phase and specialization phase were compared.

Inferential statistics were utilized to examine respondents' responses and to analyze the categorical variables. Both education level and gender of the participants were always compared using the chi-squared test. The pearson chi-square coëfficiënt was examined, but if one of the assumptions for the chi-square test was not met, the likelihood ratio was used instead. P-value of 0.05 was considered statistically significant. To demonstrate specific significances, post hoc tests of chi-square were used. The margin of error was then reduced by adjusted p-values (p_a).

RESULTS

Participants characteristics

350 participants completed the survey, with 46 dropping out before completion, resulting in a population of 314 patients for statistical analysis. The estimated response rate was 60% (n=340). Table 1 summarises the responses' distribution by gender and education level.

Variable	Domain	n=314	%
Gender			
	Male	77	24.5
	Female	234	74.5
	Unidentified	3	0.96
Education level			
	Bachelor phase	168	53.5
	Master phase	109	34.7
	Specialization phase	37	11.8

Table 1. Gender and education level

271 (86.2%) respondents reported using OL as part of their studies. The main reason why people did not use OL was because it is too distracting and because the social media platforms do not provide assurance of validated information (74.2%). Others (25.8%) don't utilise OL since they don't require it and receive sufficient knowledge from the university.

Figure 1 summarises the results discussed below.

A significant correlation was found between the education level and the use of OL ($p<0.001$). The master and specialization phases used OL significantly more during their programme than the bachelor phase. This is shown in figure 1A.

As for the correlation between the level of education and the amount of hours per week they spend using OL, a significant result was found as well ($p<0.001$). This is shown in figure 1B. Significantly more students from the bachelor phase spend more time per week using OL as part of their studies compared to students in the master and specialization phases (figure 1B).

When asked whether students consider the use of OL as part of their studies to add value to their preparations, it was clear that significantly more master's students agreed with this statement than bachelor's students. This is shown in figure 1C.

Shown in figure 1D, master's phase students recommend OL more to fellow students than bachelor's phase students ($p_a<0.008$).

These results can be found in figure 1E. A significant result ($p<0.001$) was found between level of education and getting better results (self-reported) for an exam through OL.
For instance, bachelor students in particular significantly believed they obtained better results for an exam by using OL compared to the other groups.

The findings indicated that most respondents do not consider platforms on social media to be reliable and be evidence-based ways of gathering objective information, shown in figure 1F. Significantly more master students have this opinion compared to bachelor students.

Students in the master's phase are significantly more convinced that the use of OL provides them greater insight into clinical topics compared to the bachelor's phase. This is shown in figure 1G.

No correlation was found between education level and the desire among students to receive controlled, accurate information offered on social media platforms. The majority of each group (77,7% for bachelor phase, 79,7% for master phase, and 73,7% for specialization phase) generally agreed that this information should be checked for correctness by recognized authorities. This is shown in figure 1H.

Figure 1I shows which platforms are used by different educational levels. Significantly more master's students use Youtube than bachelor's students. Significantly more undergraduates than master's students use Twitter as OL. The platform TikTok is used significantly more as OL by students from the undergraduate phase compared to students from the master's and specialization phase. Significantly more specialists are using Instagram as a platform for OL. Both for the use of Google and academic resources as a platform for OL, a significant result was found with bachelor students using this significantly more than master students.

A significant correlation was found between education level and the reason for using OL in their education ($p<0.005$), as shown in figure 1J. It was found that master students use OL significantly more for preparation of pre-clinical skills than bachelor students. For the preparation of written exams, it was concluded that undergraduate students use OL significantly more than master's and specialization. The use of OL for the reason of preparing clinical topics was used significantly more by specialists than by bachelor and master students.

89.6% of male respondents, 85% of female respondents and 100% of unidentified gender indicated that they use OL in their education. 6.5% of male students and 11.5% of female students do not use OL because it is too distracting or social media platforms do not provide validated information. Another reason why students do not use OL in their courses is because they have no need for it, because there is enough information available from the university (3.9% of males and 3.5% of females).

There is a significant correlation between the gender and the reason for using OL in their education ($p<0.001$). 65.7% of men use it to prepare for written exams, 59% for preclinical skills preparation and 66.4% for clinical skills preparation. Among the female respondents, it is clear that OL is mainly used to prepare for written exams (73.8%).

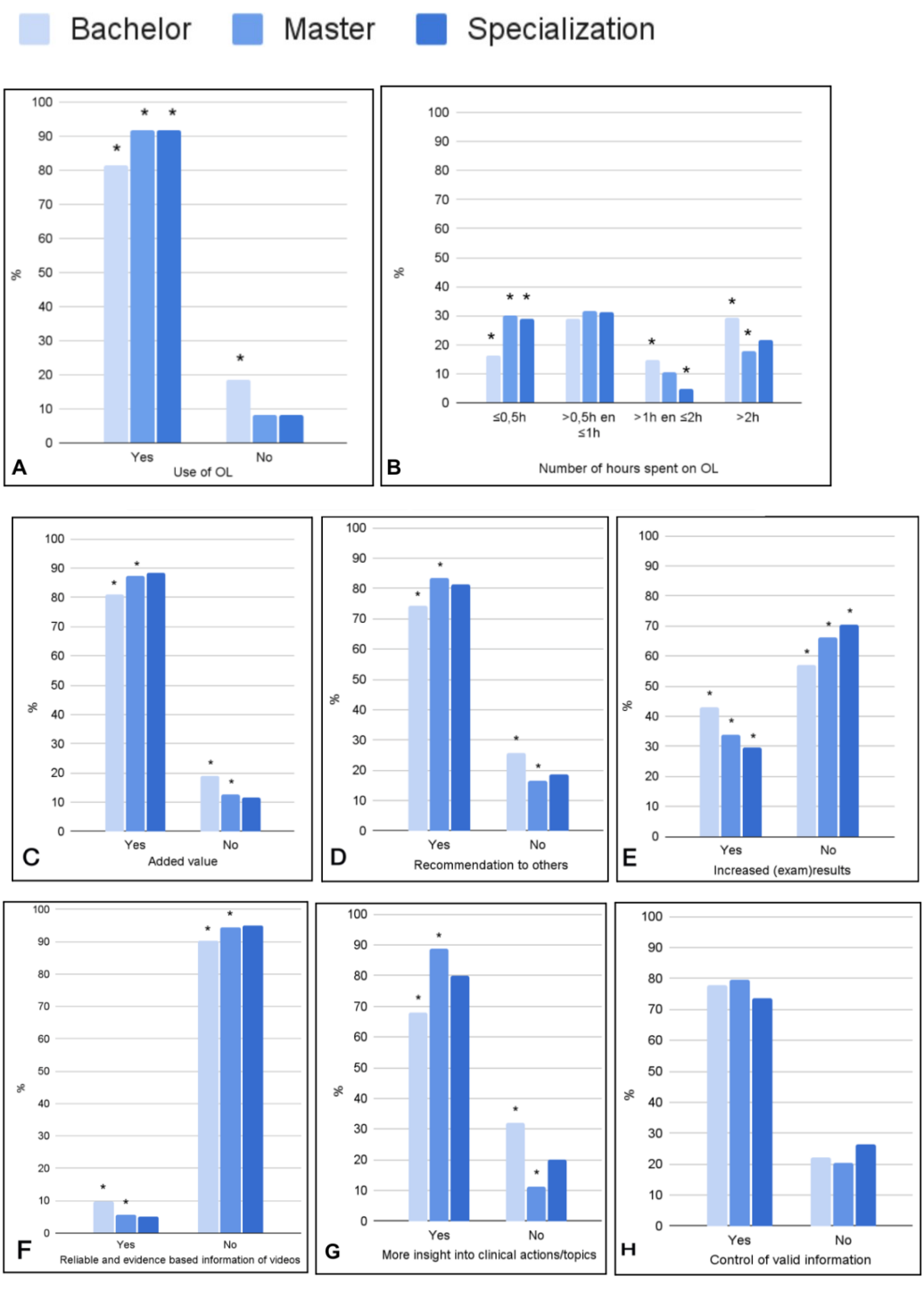
The amount of hours spent each week on OL and gender are significantly correlated ($p<0.001$). No significant correlation was found between the gender of the respondents and whether they would recommend the use of OL to other students; 75.9% of men, 79.1% of women and 87.5% of the unidentified gender.

For the correlation between gender and the contribution of OL to self-reported better exam results, a significant result was found ($p<0.01$).

The majority of men (92.5%), women (92.6%) and the unknown gender (75%) did not find the information on social media platforms to be reliable and evidence-based information for their study ($p<0.05$).

82.5% of men and 75.2% of women agree that social media platforms help gain more insight into practical topics ($p<0.05$).

Majority of each gender; 77.2% of men, 78.2% of women and 81.3% of unknown gender; feels that there is a need for monitoring the correctness of information on social media platforms.



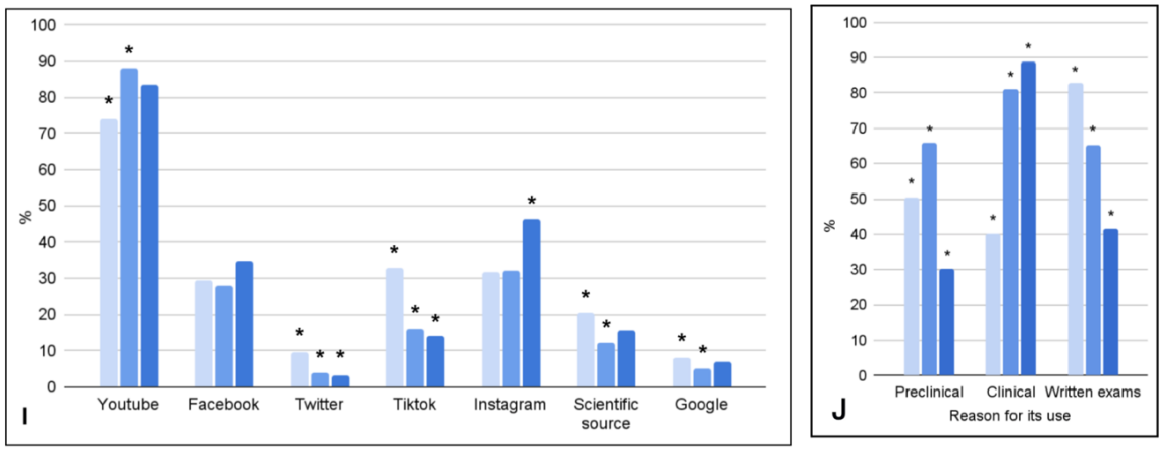


Figure 1. Comparison of education level and correlation to different parameters.
*$p_a \leq 0.008$

DISCUSSION

Research has shown that medical students feel inadequately prepared for treating their patients, making them more inclined to use OL[5]. Youtube, as an example, can not only help students during their studies to overcome these barriers, but also address certain psychological barriers[9]. Given this rapidly developing new aspect in student education, the current research aims to better understand the needs of today's students.

All generations use technology and preferences for certain teaching methods in a variety of ways. For some students, a recommended teaching method might not be effective. It may be possible to accommodate more students with different learning preferences by applying active learning techniques (such as digital learning) and altering the types of learning activities[10].

The results of this study shows a significant difference between education level and the reason why students use OL, as students in the specialization phase have less theoretical exams than students in the bachelor phase according to the curriculum of the KU Leuven. Bachelor students are less likely to use OL for clinics, as clinical skills are less presented in their courses. They use OL more often to prepare for written exams, as well as master students compared to specialists. The use of OL to prepare for preclinical skills is used most often by students in the master's phase. Again, this could be explained as this education level has the most frequent preclinical exercises at KU Leuven. Specialization-students use it mainly in preparation for the clinic and to check cases from other specialists.

Youtube is regularly used among students as a learning platform for conducting dental procedures, in particular endodontic treatments. The main reason for its use is to increase their confidence and understanding of endodontic procedures[9]. Also, dental graduates are

expected to keep up with the latest technologies in healthcare and constantly update their skills[3]. Moreover, teledentistry promotes contact between regular dentists and specialists, encourages more streamlined referrals from general dentists to specialists and takes over urgent dental requirements from hospital emergency departments[11].

The outcomes of this study also reveal that master's and specialization students spend significantly fewer hours per week using OL as part of their studies compared to bachelor's students. This could possibly be explained by the fact that master's and specialist students are more experienced and know exactly what information they want. Because of this, compared to undergraduate students, they might use a more focused search strategy to find desired information and might be better able to select sources due to their years of training, which results in less hours per week spent on OL.

Significantly more undergraduate students use the platform TikTok for OL. Approximately 32.5% of TikTok users in the United States are aged between 10 and 19 and 29.5% are aged between 20 and 29. Higher age groups have substantially lower utilization[12 13]. Previous research from The Netherlands confirms that in 2021 TikTok use was highest in the 15-19 age group. In the last year, a large increase was seen in the 20-24 age group, which ensured that this group became the main user[14]. This platform could potentially play a larger role in the near future[13]. With its short videos, this platform has the ability to reach many students but also patients with medical education. However, these short videos have limited space for references and the time limit reduces the depth of information given[15].

A significant different use of Instagram as OL platform was found between specialists on the one hand and bachelor and master students on the other. Instagram is becoming increasingly popular in the dental world. A lot of dental professionals use the platform to easily share clinical images, videos, techniques and tips with fellow dentists. By sharing their clinical work on Instagram, they hope to provide an engaging way for others to learn. Instagram quickly displays before-and-after treatment images as well as various treatment stages at varied time intervals, such as in endodontic or orthodontic cases.
Young dentists use these cases on Instagram to experiment with certain methods and hope to get better clinical results[16]. As students in higher levels of education (such as master's and specialization phase) perform more clinical skills at the KU Leuven, it is likely that they will be more interested in the use of Instagram as OL platform.

A striking contradiction in the results is that while many students use OL in their studies to better understand subject matter, they do not always find the online content trustworthy.

A substantial percentage of respondents actually recommended greater validation of information.

Burns and colleagues (2020)[8] showed that students expressed some level of dissatisfaction or uncertainty with the Youtube videos. This is in line with the teachers' doubts about the accuracy and quality of these resources. Knösel and colleagues (2011)[17] discovered that the majority of the content was not reliable. Many dentists believe it is important to remain alert for desinformation on social media and feel that it is their own responsibility to reject misinformation[18]. Students still favor Youtube over internal institutional online platforms[19]. It may be crucial for dental school professors to think about how to direct their students to reliable sources on Youtube or how they can make their own videos for the site[8]. Their pedagogy can be adapted to fit these needs of the students[8].

Azer's and colleagues (2014)[20] showed that the most easily accessible or most viewed Youtube videos are not necessarily educational or scientifically accurate. Such websites can give students the information they need, but the accuracy, validity and reliability of the sources can not be guaranteed. For example, Youtube does not have reviewers or experts checking and correcting content on the platform. They recommend that Youtube should evaluate its videos and assess which videos are for educational use. Raikos and colleagues (2014)[21] and Rabees and colleagues (2015)[6] also propose watching Youtube videos with a critical eye because information can be misleading due to the lack of review. A study of Barry and colleagues (2016)[22] shows that, given that a significant part of students use online resources like Facebook or Youtube rather than asking the professor to answer a question, instructors' perception on the use of social media need to be adjusted. Social media could be a useful tool for practitioners to refresh their knowledge and communicate with colleagues about clinical cases through continuous learning, because the scientific knowledge in dentistry doubles every five years[23].

A possible solution to check the quality of the videos and to conclude whether or not the information is evidence based, would be an authorization of these medical videos[6]. Universities can play an important role in this field by ensuring regulation of medical videos and encouraging only those that are content correct[6 8].

Facebook has the ability to join private groups, where topics can be discussed[24]. In these groups, students can ask questions about a particular topic to fellow students. Professors can also be members of this group and check that the information given is effectively correct[24]. This method of education could be more effective than using a system supported by the University (such as Blackboard or Collaborate) for interaction and asking questions.

Social media platforms such as Youtube, Instagram, and Twitter use blue verification badges on accounts of certain users. The significance of these verified badges serves to confirm the

authenticity of an account. It is used to verify the identity of users and as a tool to give people assurance that it is the official channel of a certain creator, artist, public figure or a company. Thus, the verified badge does not serve as a symbol to demonstrate authority, importance or subject matter experience[25 26 27].

Despite the importance of researchers spreading accurate knowledge online, Twitter's account verification service does not have a specific category for scientists. However, a platform such as Twitter would benefit from being able to provide reliable scientific reference points to their users. Scientists rarely qualify for a verification badge on such social platforms because they are not as well known to social media users. Furthermore, their social media engagement is not comparable to that of celebrities and influencers. It would be interesting to categorize scientists as a distinct group on social media based on verification by an institutional account or on scientific publications[28]. There is little evidence that the verification badges are seen by social media users as a symbol for judging the quality of content and contributing to the credibility of accounts. Platforms may need to revise their verification badges to ensure that they provide more information to users about the quality of content on such accounts[29].

In the dentistrycurriculum at KU Leuven, the course 'scientific thinking, questioning and reasoning' tries to teach students how to distinguish between scientific and non-scientific information. However, this mainly focuses on finding reliable sources on the platform Pubmed, rather than on social media platforms such as Youtube, Facebook, Instagram etc. The possibility of validating the information on these social media platforms should be further explored.

The study of Ghandi and colleagues (2022)[18] has shown that some dentists are also sometimes uncomfortable with the ethical issues associated with sharing such clinical information on social media. To make social media use safer and more professional, it has also been recommended that stricter rules must be put in place[18]. Platforms such as Facebook or Instagram often feature patient cases. It is important to consider privacy and security concerns using social media in healthcare settings[30].

In this study, we observed that most dentistry students had access to OL and were able to use it. However, this study was performed with specific settings in a single country. As a result, the findings might not apply to other countries. It must be confirmed by more research conducted in various countries. Those replication studies could help determine whether OL has added value for students, particularly in clinical skills or exams.

We did not examine whether men or women make greater use of OL. This may be investigated in further research. According to a survey, female students were more satisfied with online education than male ones[31]. The use of supplementary online resources to go deeper into subjects was more crucial for female students[31]. A study by Ganjoo and colleagues (2021)[32] conducted at Malaysian universities reveals that there are differences in the terms in usage by men and women when referring to online learning portals. OL usage is more present in female students[33].

Another limitation of the study design is the cross-sectional nature. In several countries, longitudinal studies are required. Is the extent of use of OL different in the 1st bachelor year of the study compared to the last master phase within the same person?

This study did not compare different ages among the correspondents, only the level of education. If age had been included in the questionnaire, we could have been able to see which platform is mostly used in different age groups. All age groups have a significant interest in using social media in the medical profession, but younger individuals are generally more comfortable and active in this digital world[30].

CONCLUSION

The results of this survey show that dental students at KU Leuven generally use OL relatively frequently as part of their studies. Nevertheless, the majority of these students do not consider social media platforms to be reliable and not an evidence-based way of gathering objective information. Almost all respondents believe it is necessary for information offered on these platforms to be checked for accuracy by recognised authorities. Further research is needed to determine whether videos can be validated.

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