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Perceptions of Social Media Use Among Dental Hygiene and Dental Hygiene Therapy Students and their Relative Applicability in Dental Education

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Abstract:

Background/Aim: There is an increasing use of social media platforms (SMP) by University students in dentistry. This study aimed to assess the perceptions of dental hygiene and dental hygiene therapy (DH/DHT) undergraduate students on the use of social media (SM) at the University of Portsmouth Dental Academy [UPDA].

Materials and Methods: A total of 144 undergraduate students who represented first [n=45], second [n=57], and third-year [n=41] students participated in the descriptive/ analytical study. Following the ethical approval and written consent form, all participants filled out a validated and reliable (Cronbach's alpha: 0.691) questionnaire [four sections] that assessed sociodemographic, SM usage (type, duration, and purpose), and perceived advantages and disadvantages [16 items (5-point agreement-based Likert scale)]. Descriptive statistics (frequency, percentage, and mean) were derived, followed by inferential statistics tests, such as Kruskal–Wallis and post-hoc test. The probability value was considered significant at a *p*-value of 0.05.

Results: A higher percentage of study participants were females (76.22%), with an average age of 22.96 (4.58), which belonged mostly to the 16–25-year-old age group (72.1%). A higher frequency of participants spent 6–10 hours (h)/week (58.04%), with the most popular SMPs being WhatsApp, YouTube, Instagram, and Facebook in descending order. Entertainment and general information were considered the purpose with higher frequency. Meanwhile, consensus was observed among most participants, who showed no significant differences ($p > 0.050$) in their agreements or disagreements and between students from different years.

Conclusion: Undergraduate DH/DHT students who use multiple SMPs largely perceive that these platforms are meant for entertainment and information gain. Most of the students agreed regarding the advantages and disadvantages of SMPs without any conflict.

Keywords: Internet, Social media, WhatsApp, Facebook, Dental students, Dentistry, Dental hygiene.

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1. INTRODUCTION

The future social dynamics may be completely associated with social media (SM) and the increase in affordable internet usage globally [1]. An estimated 4.2 billion people currently use one or multiple forms of SM [2, 3], and this makes these applications one of the most prevalent means of communication and information gathering [4]. With the advent of smartphones, SM has transformed our approach to information gathering and sharing, which has led to a considerable shift from traditional books to internet-related sources and applications [5], with SMPs particularly attracting the youth [6]. The widespread SMPs include Google, Facebook, WhatsApp, YouTube, Instagram, Twitter, Telegram, Snapchat, and others [7, 8], and they allow people to connect and communicate with others [3].

Technology and quick communication have influenced all forms of education (primary, secondary, and higher) and initiated regular transformations, educational innovations, and constantly evolving social norms [7]. The roles of educators have transitioned from being authoritative figures to being guides who encourage students to acquire information on their own [9]. Simultaneously, students have transitioned from being passive classroom recipients to active and constructive individuals who evaluate the reliability, validity, and strength of information sources critically [10]. SM differs from traditional media in that it permits students to communicate intimately with their peers and instructors and promotes engagement and conversations regarding course materials outside and inside the classroom [11].

SM can be a highly influential tool for learning, and SM-associated learning has been explained on the basis of several theoretical concepts. The social constructivism theory and learning model explains social media on the basis of culture and context being crucial to social constructivism because they allow us to make sense of society and build our knowledge from there [12, 13]. With digital media usage, learning ecologies built on the tenets of heutagogy (Self-Determined Learning) can reach their full potential [14]. In the cognitive-learning theory (activity-based learning), a student "constructs" or builds his own knowledge microcosms by drawing on prior knowledge, current experiences, and data interaction. Connectivism Learning Theory focuses on eight principles: diversity of opinions, connecting, digital storage, capability to distinguish more, fostering and preserving connections, recognizing connections between fields, and accurate, up-to-date knowledge [13, 15]. It emphasizes the importance of collaboration, the competence to view relationships between ideas, and the need for continuous learning. Making decisions is like learning a new language; as more information becomes available, our comprehension will grow and change [14]. This approach fosters a long-term learning environment and fosters a more inclusive and effective learning environment.

In addition, SM allows the expansion of educational thoughts and interactions with pupils while providing more experience than traditional media [16]. Students can devote more time and attention to learning new things by engaging in interactive debates, comments, and sharing messages *via* SM [17]. The University of Portsmouth (UOP) has integrated some SMPs, including Moodle, Instagram, YouTube, LinkedIn, Twitter, and Facebook, into its education process to improve learning. Among reputable educational organizations in the United Kingdom (UK), the UOP has achieved a competitive ranking and offers undergraduate and postgraduate courses across various disciplines [18]. The UOP offers graduate courses in dentistry and ancillary/assisting degree programs such as dental nursing, dental hygiene, and dental therapy.

Similar to most other technical professions, dental training relies profoundly on interactions with teachers, who act as coaches, mentors, demonstrators, and assessors throughout their students' academic path [19]. Student–teacher interactions as a source of knowledge construct a positive impact that leads to great academic performances and excellent learning experiences [7, 20-22]. Dental students in the UK and other countries have reported using various SMPs [23, 24]. A student watches a YouTube procedural video prior to a clinical session to improve his skills, whereas a teacher posts a YouTube video of a recorded lecture before conducting a lecture.

Seo *et al*. [25] found that YouTube videos, when integrated with courses, improved students' understanding levels compared with traditional lectures. Instagram is more popular among students as it provides up-to-date and recent advances and trends in dentistry, especially those related to materials, equipment, research papers, and techniques. Similarly, WhatsApp and Facebook are mostly used for communication with teachers, peers, and guides and for sharing healthcare educational materials [23, 26-29]. Elraggal [27] investigated the role of SM in dental education among five universities in the UK, including the UOP, and observed that 51.5% of the subjects use it for communication with peers, which ranged from once a day (30.8%) to once a week (43.9%). Souza *et al*. studied the learning of infection control by undergraduate dental students using

three different SMPs (Facebook, Instagram, and WhatsApp). The results revealed a relatively large percentage (98.3% for Facebook, 100% for WhatsApp, and 90% for Instagram) of users obtaining information from SM [30].

Between medical and dental students, Saadeh *et al*. [31] observed higher utilization of SM by dental (49%) students compared with medical (41%) students. Students also considered SM advantageous because of their accessibility. Other advantages of using SMP included free access (internet plans offer free SM use) [3, 24] and being student-friendly economically (especially for those living away from campus) [27]. Despite their multiple advantages, SMPs cause distraction among students on WhatsApp [3] and Facebook [32] while consuming a considerable amount of time.

A notable concern has also been observed regarding the quality and lack of evidence-based information on SMPs [32, 33]. These reasons for lack were coined by those reluctant to use SMP to obtain professional information [32]. Other major issues associated with the use of SMP include the promotion of non-professional behavior (negative comments on faculty, university, staff members, and other students) without consent and breach of confidentiality [34].

Despite numerous studies conducted on using SMPs by dental students, no research has investigated how dental hygiene (DH) and dental hygiene/therapy (DHT) students perceive and utilize SMPs. This study was therefore aimed at the evaluation of the current perspectives and perceptions of undergraduate DH/DHT students on the use of SMPs as a learning tool for enriching their education. The objectives were to assess the variables (timing, purpose, advantages, and disadvantages) associated with SMP usage among students and accordingly provide recommendations for UOP educational practices and future studies. We hypothesize the presence of little or lack of differences in the perceptions of SMP use among students of DH/DHT at UPDA.

2. MATERIALS AND METHOD

2.1. Ethical Approval

The study protocol was approved by the ethics committee of the School of Dental, Health and Care Professions, Faculty of Science and Health University of Portsmouth (SDHCP 2025-003B). All participants were briefed regarding the purpose of the study and the direct or indirect benefits that they would receive from its implementation. Anyone was allowed to refuse to participate before they provided written consent for the study.

2.2. Study Design

To align with the research objectives, we deemed a face-to-face survey using paper and the most appropriate research design. A valid and reliable questionnaire was distributed to a sample (convenience) of DH and DHT undergraduate students at the UPDA during the academic year 2023–2024. Descriptive and analytical approaches (mixed-methods research) were utilized in this cross-sectional study to collect relevant data. The related literature was collected and assessed using the Crowe Critical Appraisal Tool [35].

2.3. Study Subjects

The convenient sample included three consecutive-year groups of DH/DHT students (first, second, and third year) from a single cohort of the UOP dental school. This sampling method was used for the convenient selection of students based on their qualities or expertise. This sampling method is suitable when the sample sizes are small or when participants possess relevant knowledge valuable to the research [36]. The inclusion criterion was being enrolled in the DH/DHT undergraduate program of the UPDA. A total of 144 undergraduate students who represented first [n=45], second [n=57], and third-year [n=41] students participated in the study.

2.4. Questionnaire Details

The survey instrument (questionnaire), which was used to identify the SMP usage and attitudes and perceptions of the participants toward SM behavior, was developed and structured in English. The questionnaire was developed under the guidance of earlier similar studies [23, 27, 29, 32] and a focus group discussion involving experts in the field at UPDA.

The questionnaire was organized into four sections comprising 23 questions, including 5 closed-ended, 2 multiple-choice, and 16 Likert-scale questions (5-point, “Strongly Disagree” at 1 to “Strongly Agree” at 5). The first section focused on participant information material and the collection of sociodemographic information. The second section explored SM usage habits (SMP types, reasons, and time spent) and captured relevant data on the frequency and purpose of SM use (habits and motivations of participants related to SM use). The last two sections focused on participants’ perspectives concerning the advantages (eight questions) and disadvantages (eight questions) of SM usage for educational purposes. The aim of these sections was to gain insights into the benefits and drawbacks of SM integration into the educational environment.

All descriptive statements were matched to dichotomous scales to derive the behaviors undertaken by participants and those that were witnessed visibly. The structure and layout of the Likert scale were organized in a manner that would prevent a participant from responding in a predetermined manner to avoid any influence on the generation of a particular dataset. Although numerous questions were obtained from previously validated studies, a panel of experts in the respective field was consulted to determine the content validity of the final questionnaire. The questionnaire was then piloted on a general population and was refined in terms of the content and appropriateness of the construct. The refined questionnaire was then pilot-tested again on a sample of DH/DHT students across three universities for relevance and face validity. Statistically, the reliability of the questionnaire was assessed through the calculation of Cronbach’s alpha, whose value of 0.691 indicates good reliability.

2.5. Questionnaire Distribution and Collection

Relevant data were collected after the scheduled lectures, laboratory, or clinical sessions of relevant students on a single day. All relevant students were notified regarding the study conduct through their university emails and text

phone messages. The questionnaire was maintained anonymous in terms of personally identifiable information. Any participant who was absent during the class or session was requested to fill out a private form at any time on the same day.

2.6. Statistical Analysis

The data collected on questionnaires were then transferred onto a Microsoft Excel sheet, followed by its visualization, correction, coding, and analysis. The coded data were manually entered into the Statistical Package for Social Sciences (SPSS) software (Version 29). Descriptive analyses were conducted to calculate the mean and standard deviation to identify the perceived advantages and disadvantages of using SM for educational purposes. Shapiro–Wilk test of normality was conducted to determine data distribution. A nonparametric Kruskal–Wallis test was used to analyze group differences in the ranks generated on the five-point Likert-scale questions using the median as the central tendency measure. The Post hoc test was performed *via* the Dunn test after correcting the alpha value through Bonferroni correction, which described the relative probability value "p" of 0.05.

3. RESULTS

3.1. Demographic Characteristics of the Study Subjects

Table **1** shows the sociodemographic characteristics of the participants. From a total cohort of 150 enrolled DH/DHT undergraduate students at UPDA, 143 (95.3%) participants responded to the survey. Among the participants, 109 (76.2%) were females, and 34 (23.78%) were males. DH students (n = 72, 96%) accounted for the highest participant responses rather than DHT students (n = 71, 94.6%). Among various levels (academic years), higher responses came from first-year (n = 45, 100%), followed by second-year (n = 57, 95%) and third-year (n = 41, 91.1%) DH/DHT students. The total sample age was in the range of 16–37 years, with the total sample having a mean age of 22.96 years. Males had a lower mean age of (22.78) than females (23.57) in the total sample, with the highest number of participants belonging to the 16–20-year-old age group (n = 52, 36.4%), followed closely by those belonging to the 21–25-year-old age group (n = 51, 35.7%).

Table **2** presents the comparative differences among various parameters (duration, platform types, and purpose) of SM used by the participants.

All participants reported the use of SMPs, with the majority of students utilizing multiple applications. The most popular SMPs used by the students were WhatsApp (88.81%), YouTube (83.91%), Instagram (83.21%), and Facebook (72.72%), whereas the least used were Telegram (14.68%) and Twitter (17.48%). For each year, the highest frequency of the total students and students reported using SMPs for 6–10 h per week (58.04%), followed by those using them for less than 5 h per week (27.97%). A majority of the students used SMPs for entertainment (96.5%), obtaining general information (88.81%), and dental learning (83.2%). Less than 40% of the student participants reported making friends, having general discussions, and exchanging general ideas, and this finding indicates that the students do not view such activities as the main purposes of SMPs.

3.2. Students Perception about the Advantages and Disadvantages of SMPs

A 16-item Likert scale was used to assess the students' perceptions of the advantages (8 items) and disadvantages (8 items) of SMPS. Table **3** presents the frequency distribution of participant responses and mean scores. The majority of the respondents agreed that learning through SM was convenient [n = 126 (86.71%)] and allowed them to gain information on various subjects [n = 131 (91.6%)]. Most students also agreed with their improved communication with their teachers and classmates [n = 122 (85.31%)], which in turn allowed them to upgrade their teamwork skills [n = 90 (62.93%)]. A very low percentage of participants disagreed with the advantages of SM at any level; that is, no one disagreed with the observed improvement in communication with teachers. Coincidentally, a high percentage of participants agreed to become independent learners [n = 108, 75.5%], which directly influenced their skills in research [n = 102, 71.3%] and innovativeness [n = 99, 69.23%].

Table 1. Demographic characteristics of the DH/DHT undergraduate student participants.

Demographic Variables		-	Academic Year			Total
		Total N(%)	Year 1 N(%)	Year 2 N(%)	Year 3 N(%)	
Participated	DH	72(96)	22(100)	30(96.8)	20(90.9)	143 (95.3)
	DHT	71(94.6)	23(100)	27(93.1)	21(91.3)	
Gender	Female	109	36(25.2)	44(30.8)	29(20.3)	76.22
	Male	34	9(6.2)	13(9.1)	12(8.4)	23.78
Age	Groups	16-20	14(9.8)	21(14.7)	17(11.9)	52(36.4)
		21-25	17(11.9)	22(15.4)	12(8.4)	51(35.7)
		26-30	6(4.2)	11(7.7)	3(2.1)	20(13.9)
		31-35	5(3.5)	2(1.4)	4(2.8)	11(7.7)
		>35	3(2.1)	1(0.7)	5(3.5)	9(6.3)
	-	-	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
	Total	-	24.06±5.64	22.82±4.55	21.95±2.60	22.96±4.58
	Gender based	Male	24.15±5.23	22.50±4.69	21.59±2.46	22.78±4.46
		Female	23.94±6.45	24.20±5.33	22.36±2.77	23.57±5.09

Abbreviations: DH = dental hygienist; DHT = dental hygiene and therapy; N = number; % = percent.

Table 2. Comparative differences in various parameters associated with the use of various SMP among students.

Parameters	-	Total	Percent	Year 1	Year 2	Year 3
	Number of Participants	N = 143	%	45 N(%)	57 N(%)	41 N(%)
Duration	≤ 5 h/w	40	27.97	12(8.39)	17(11.89)	11(7.69)
	6-10 h/w	83	58.04	27(18.88)	31(21.67)	25(17.48)
	11-15 h/w	5	3.50	2(1.40)	2(1.40)	1(0.70)
	16-20 h/w	12	8.39	3(2.10)	5(3.50)	4(2.80)
	≥ 20 h/w	3	2.10	1(0.70)	2(1.40)	0(0.0)
	None	0	0	0(0.0)	0(0.0)	0(0.0)
SMPs	WhatsApp	127	88.81	36(80)	52(91.2)	39(95.1)
	YouTube	120	83.91	18(40)	42(73.7)	38(92.7)
	Instagram	119	83.21	40(88.9)	42(73.7)	34(82.9)
	Facebook	104	72.72	31(68.9)	36(63.1)	33(80.4)
	Snapchat	81	56.64	27(60)	31(54.4)	22(53.7)
	Google+	76	53.14	18(40)	26(45.6)	27(65.8)
	Twitter	25	17.48	11(24.4)	5(8.8)	5(17.1)
	Telegram	21	14.68	8(17.8)	10(17.5)	4(8.9)
	Others	14	9.79	4(8.9)	0(0.0)	6(14.6)
Purpose	Entertainment	138	96.50	45(100)	47(82.4)	41(100)
	General Information	127	88.81	38(84.4)	51(89.5)	38(92.7)
	Dental Learning	119	83.21	36(80)	52(91.2)	35(85.4)
	Sharing Information	85	59.44	30(66.7)	37(64.9)	22(53.7)
	Professional Networking	62	43.35	15(33.4)	31(54.4)	21(51.2)
	Exchanging General Ideas	43	30.06	14(31.1)	20(35.1)	11(26.8)
	Making Friends	42	29.37	28(62.3)	15(26.3)	16(39.1)
	General Discussion	32	22.37	10(22.3)	4(7.0)	10(24.4)
	Others	35	24.47	7(15.6)	6(10.5)	22(53.7)

Abbreviations: DH = dental hygienist; DHT = dental hygiene and therapy; SMP = social media platform; N = number; % = percent; H = hours; w = week.
Note: Other SMPs = (wire, signal, viber, discord).

Table 3. Comparative differences in the frequency distribution and mean score values (Likert scale) of DH/DHT students' perceptions regarding the advantages and disadvantages of using the SMPs.

-	Item	SD	D	Ne	A	SA	Total Score
	Prefix 'I believe that"	N(%)	N(%)	N(%)	N(%)	N(%)	M±SD
Advantages	SM makes my learning more convenient.	0(0)	5(3.5)	14(9.8)	72(50.3)	52(36.4)	4.21±.0.750
	SM improves my teamwork skills.	5(3.5)	9(6.3)	39(27.3)	69(48.2)	21(14.7)	3.65±.0.925
	SM improves communication with my classmates and teachers.	0(0)	0(0)	21(14.7)	62(43.4)	60(41.9)	4.27±0.705
	SM helps me gain more information on different subjects.	2(1.4)	5(3.5)	5(3.5)	41(28.7)	90(62.9)	4.48±.0.844
	SM helps me become an independent learner.	0(0)	16(11.2)	18(12.6)	58(40.6)	51(35.6)	4.00±.0.975
	SM improves my research skills.	2(1.4)	16(11.2)	23(16.1)	58(40.5)	44(30.8)	3.87±1.032
	SM reduces the cost of learning (educational materials).	0(0)	14(9.8)	23(16.1)	37(25.8)	69(48.3)	4.13±1.016
	SM improves my ability to be creative and innovative.	2(1.4)	12(8.4)	30(21)	69(48.2)	30(21)	3.79±.0.926
Disadvantages	Using SM requires formal training.	25(17.4)	71(49.7)	28(19.6)	16(11.2)	3(2.1)	2.48±.0.948
	Using SM requires more work and preparation.	28(19.6)	69(48.3)	34(23.8)	7(4.9)	5(3.4)	2.24±.0.935
	Searching for a topic through SM is more time-consuming than that topic is worth.	14(9.8)	67(46.8)	32(22.4)	25(17.6)	5(3.4)	2.58±1.001
	SM distracts me from studying.	0(0)	9(6.3)	14(9.8)	62(43.4)	58(40.5)	4.18±.0.859
	SM increases my addictive potential (*i.e.*, spending long hours on SM).	0(0)	5(3.5)	16(11.2)	74(51.7)	48(33.6)	4.16±.0.751
	SM reduces my focus on learning and retaining information.	0(0)	30(21)	46(32.1)	42(29.4)	25(17.5)	3.44±1.018
	SM reduces my ability to write effectively without relying on spell-checking tools.	9(6.3)	12(8.4)	37(25.9)	69(48.2)	16(11.2)	3.50±1.020
	SM has reduced face-to-face interaction, negatively affecting my social skills.	2(1.4)	46(32.2)	30(21)	51(35.6)	14(9.8)	3.19±1.053

Abbreviations: DH = dental hygienist; DHT = dental hygiene and therapy; SM = social media; SMP = social media platform; N = number; % = percent; M = mean; SD = standard deviation; SD = strongly disagree; D = disagree; Ne = neutral; A = agree; SA = strongly agree.

Table 4. Comparison of the differences in ranks of DH/DHT students' perceptions regarding the advantages and disadvantages of using the SMPs for educational purposes.

-	Item	Yr 1	Yr 2	Yr 3	Kruskal Wallis test		Post hoc (Dunn) *p*-values		
	Prefix 'I believe that"	Median			H Statistic	*p*-value	Yr 1-2	Yr 1-3	Yr 2-3
Advantages	SM makes my learning more convenient.	5	5	5	2.03	0.362	0.169	0.844	0.218
	SM improves my teamwork skills.	4	4	3.5	3.981	0.136	0.870	0.058	0.190
	SM improves communication with my classmates and teachers.	4	4	4	0.695	0.706	0.668	0.408	0.831
	SM helps me gain more information on different subjects.	5	5	5	1.287	0.525	0.338	0.347	0.817
	SM helps me become an independent learner.	4	4	4	0.193	0.907	0.993	0.684	0.757
	SM improves my research skills.	4	4	4	1.037	0.595	0.355	0.448	0.734
	SM reduces the cost of learning	4	5	4.5	1.062	0.587	0.401	0.378	0.874
	SM improves my ability to be creative and innovative.	4	4	4	3.711	0.156	0.597	0.135	0.090
Disadvantages	Using SM requires formal training.	2	3	2	2.122	0.346	0.145	0.584	0.298
	Using SM requires more work and preparation.	2	2	2	4.054	0.131	0.078	0.110	0.598
	Searching for a topic through SM is more time-consuming than that topic is worth.	2	2	2	0.425	0.808	0.931	0.575	0.601
	SM distracts me from studying.	4	5	4	1.266	0.531	0.759	0.382	0.322
	SM increases my addictive potential	4	4	4	0.125	0.939	0.723	0.888	0.804
	SM reduces my focus on learning and retaining information.	3	4	3	0.970	0.615	0.359	0.487	0.703
	SM reduces my ability to write effectively without relying on spell-checking tools.	4	4	4	1.347	0.509	0.249	0.753	0.361
	SM has reduced face-to-face communication, negatively affecting my social skills.	4	2	3	1.232	0.540	0.308	0.419	0.691

Note: DH = dental hygienist; DHT = dental hygiene and therapy; SM = social media. Statistical test employed = Kruskal-Wallis non-parametric rank test comparing the differences in ranks between different groups; post hoc test = Dunn test with corrected α using Bonferroni correction method [corrected = α / m = 0.10 / 3 = 0.03333]. Statistical significance: Kruskal Wallis test ($p \leq 0.05$); Dunn test ($p \leq 0.03$).

The highest percentage of disagreement regarding SMP advantages was observed for these same items. Notably, most students disagreed with statements implying that SM requires formal training [n = 96, 67.13%], entails additional work and preparation [n = 97, 67.83%], and takes more time than the topic is worth [n = 81, 56.64%]. This condition shows a satisfactory level of digital literacy and student were confident regarding their ability to use SM. However, several students also concurred that SMPs distract them from studying [n = 120, 83.91%], are addictive [n = 122, 85.31%] and reduce their focus on learning [n = 67, 46.85%]. The highest percentage of neutral participants had difficulty focusing on learning [n = 46, 32.1%]. The largest majority of participants who agreed or were neutral to SM showed reduced writing ability [agree 59.45%, neutral 25.9%] and social skills [face-to-face interaction] [agree 45.45%, neutral 21%]. The mean scores of the advantages and disadvantages reflect the frequency distributions of responses (Table **3**).

3.3. Differences in Ranks among Different Levels of Students

Table **4** shows the comparative results of the Kruskal–Wallis rank test of the differences in ranks of perceived advantages and disadvantages of SM and SMPs for educational purposes scored *via* various academic levels (years 1, 2, and 3). All groups attained equal mean ranks for all advantages and disadvantages, with no statistically significant differences observed. The post hoc test results reveal the nonsignificant differences of SM at some levels [SM requires more work and preparation (years 1–2), SM improves teamwork skills (years 1–3), and SM improves creative and innovative abilities (years 2–3)].

4. DISCUSSION

This study involves the questionnaire to study the perceptions regarding the use of SM on the academic journey of years 1, 2, and 3 DH/DHT students at the UPDA. The major findings of the study were as follows: The respondents, which mostly belonged to the 16–25-year-old age group, reported using multiple SMPs, with most of them spending an average of 6–10 h per week on such applications. The most frequently used SMPs comprised WhatsApp, Instagram, YouTube, and Facebook. However, a large majority of the students reported using SMPs for entertainment or general information. Notably, this study aimed to determine the feasibility of incorporating SMPs as a part of the educational curriculum of DH/DHT students. The research also compared results on the benefits and drawbacks of SM across different years of study. Although students generally agreed on the benefits of incorporating SM into the learning process, a nuanced view of the possible negatives was also observed and indicates that SM should be used with caution.

The mean age observed of the study participants aligns with the existing demographic profile of undergraduate students in the UK, which is the age range of 21–24 years [37]. This age range also corresponds to those identified in similar studies, the inclination of younger individuals to increase their use of various SMPs [27, 38, 39]. Parents and relatives of young adults gift electronic gadgets, especially mobile phones, during or at the end of higher education

[40]. Professional training centers and institutes require students to stay within the college campus which further enhances their need to have a mobile phone for communicating daily with their parents. These factors explain why mobile phones are being handed over at a young age when responsible use of such gadgets is more necessary [1, 40]. The higher number of females opting for DH/DHDT as a career option also aligns with the broad gender distribution patterns in the UK DH/DHT field, according to the International Federation of Dental Hygienists [41]. The results of this study are consistent with those of international [23] and national studies [34], where students reported spending between 6 and 10 h per week on SM. Comparatively, a study in Bangladesh reported that students spent more time [1.5 to 3 h per day] on SMPs [42]; such a result was attributed to the substantial free time the students had and related to cultural differences and variations in university curriculum models. Besides communicating through SMPs, students have been reported to spend significant time on games, erotic content, and random content. Negative impacts due to such online consumption have been reported to affect students' routine behaviour (late sleeping) and wider moral impacts [43]. Time bound crossing levels of games to fetch free points has been found to be one of the reasons for spending more time when playing online games [1, 7, 13].

In our study, WhatsApp was the most preferred SMP by undergraduate students, which is consistent with the finding of an early study at UPDA [27], Ehsan *et al*. [8], Rajesh *et al*. [23], and Uma *et al*. [29], reported similarly preferred SMPs. The application has gained popularity, especially among youth, because it is mainly internet-based and does not incur costs other than the internet plan subscription [3, 9]. It allows the sending and receiving of unlimited texts, pictures, and videos stored on the Android phone. Also, it is considered safe in terms of revealing personal and other social information [20, 27]. However, WhatsApp also suffers from drawbacks, including the potential spread of false information given the lack of verification process and content censorship, which bear importance in the academic context [1, 4]. In recent years, WhatsApp has been misused by political parties in many parts of the world to spread false information to youth, especially those who come out in large numbers to vote for the sake of employment and economic reforms by concerned political parties. The application users are registered through the phones, which are accessible to the net providers and government organizations.

The students included in this study use various SMPs primarily for entertainment, sharing of information, and dental learning, which is in agreement with the results obtained by McAndrew *et al*. [44], Aboalshamat *et al*. [45], and Abrar *et al*. [46]. Evidence gathered related to SM use over the years is reflected in the widespread adoption of technology, which has opened up new routes for learning [47]. There is value in SM as an educational tool and it is recommended its integration into learning practices [48]. Studies recommend cross-referencing educational material to ensure accuracy and reliability, which in turn can be time-consuming [1, 49]. Distracting advertisements, false links, tempting promotions, and a wide range of erotic content has been reported to be some of the reasons that extend search time by users [21, 32]. The high percentage of DH/DHT students who use multiple SMPs can also be due to the COVID-19 pandemic when the education system shifted toward remote learning and virtual communications due to governmental lockdowns and social distancing.

Most improvements in basic and clinical learning were investigated during the pandemic [50]. Accordingly, students who began their academic journey during this period had to quickly adjust to online education, and thus, they relied heavily on SMPs for communication, collaboration, and accessing educational resources [51]. Comparative findings on the three academic years investigated in this study revealed that third-year students use less SM for education and learning compared with their juniors. These findings agree with those of a recent study [23], which also reported that final-year dental students nearing the end of their professional training are becoming more self-reliant learners, particularly the need to handle complex clinical cases as part of their final training. The DH/DHT curriculum has more clinical related subjects in later years than in initial years. Also, since professional learning is patient-based, therefore students in higher years need to devote more daily time to studies to enhance their competence. Case based learning also requires a student to dedicate extra time to study the case as and when the student encounters such a case. These reasons provide an explanation for students in higher years spending more time on studying and less time on SMP.

4.1. Perceived Advantages and Disadvantages of using SMP among Students

The present results indicated a total agreement regarding the advantages and disadvantages of SM use observed among all the study participants, as no differences existed for any questionnaire item. This study identified the majority of students who agreed to five major advantages [information gaining, peer communication, learning convenience, independent learning, and economics]. These findings are in agreement with those of Bhola and Hellyer [52], Hamid and Jafar [53], and Elraggal *et al*. [27]. According to Hamid and Jafar [53], dental students are motivated to use SM for learning purposes because they facilitate group discussions, promote active learning, and deepen the comprehension of educational content. Social technologies enable students to generate content, opinions, and support through comments, friendships, and communication. They can collaboratively learn, solve problems, and organize study groups, fostering a more interactive learning environment. These outcomes were similarly reflected in our study, especially among participants in their 1st and 2nd years. Such findings suggest that students in both years highly value SM as a tool for accessing diverse educational content and facilitating collaborative learning and interaction among their peers and tutors. Bhola and Hellyer [52] and Elraggal *et al*. [27] observed that students benefit from using social media as a learning tool because of the free access to various educational materials from around the world. This expands their learning opportunities and helps them become independent learners. Additionally, the authors found that stu-

dents living off-campus highly value online lectures because it helps them save time and money on commuting and rent. These findings are based on the responses of second and final-year students in the study. The consistency of these results may be due to the changes in educational dynamics brought about by the pandemic. With many universities adopting a hybrid learning model, students now have the flexibility to pursue their studies without the need to physically relocate during their university years. The majority of the students included in this study also agreed with the five drawbacks [distraction, addiction, declining writing skills, decreased learning focus, and interpersonal communication] of using SM for educational purposes. The potential of SM to cause distraction and addiction is in accordance with the findings of earlier studies [5, 27]. Researchers found that nurses who regularly used social media were more likely to experience unpleasant emotions, including jealousy, social anxiety, and ruminating, all of which contributed to their increased propensity to become distracted from their work [54].

Students also largely agreed on the negative effect of SM on their writing ability and memory. The results were similar across all three age groups, indicating a widespread recognition of the negative impact of social media on spelling, attention to detail, and vocabulary development. This is in agreement with those obtained by Priya and Guzman [55] and Wu *et al*. [56], which indicate that many people struggle with spelling and grammar due to their heavy reliance on spell-check features on smartphones or computers. In addition, students rely on readily available information on SM and the internet when searching for answers, which diminishes the emphasis on active learning and knowledge retention [56]. These results indicate that the persistence of such a trend may cause students to develop a habit of prioritizing convenience over depth of understanding. This may impede their academic growth and professional success. Hence, educational institutions should find strategies to address these concerns effectively. Such strategies may include the integration of digital literacy and responsible SM use into the curriculum, provision of resources and support for the improvement of writing skills.

Most of the respondents in this study agreed that the reduction of face-to-face interactions due to SM can hamper the social skills of the coming generations. Although no significant differences were observed among various groups, a higher median was observed for 1st year students [4] compared with 2nd and 3rd year students [3]. This in-clination can potentially be attributed to the adjustment period associated with students' initial exposure to uni-versity life and the integration of SMPs into their learning process for educational purposes. Celikkalp *et al*. [57] highlighted the negative effects of SMPs on university students.

This study is novel in terms of the assessment of the perceptions of the usage of SM and SMPs by DH/DHT students. The use of a single institution (University of Portsmouth) with a smaller number of students limits the value of the results out of this low sample size. Due to the limitations in methodology, the results of this study cannot be generalized to other student populations. This study can be extended, covering more samples in various institutions. The evidence collected from such studies in the future can be further strengthened by longitudinal studies. In addition, the respondents possibly showed bias given that all of them were using SMP, and therefore, the outcomes can only be derived through their comparison with nonusers of SMP.

Based on the results of this study, certain recommendations are suggested that will mitigate the concerns of using SMP among DH/DHT students. The culture of using smartphones within the college campus, especially in clinical setups, needs strict implementation with greater emphasis on student education about responsible use of SMP. Mentors themselves need to restrain themselves to serve as role models to students. Parental counselling for those who are suspected of overusing SMP should be initiated. Screening of SMP can provide data as to who is using SMP during clinical hours. Accordingly, policies need to be developed to counter such use.

CONCLUSION

This study explored the role of SMPs in DH/DHT students and highlighted their potential for academic improvement and entertainment. However, concerns regarding distraction and addiction suggest they can affect the performance of the student and mental well-being. Educational institutions should also promote responsible usage, time management, and healthy digital habits to empower students to harness the advantages of SMPs while minimizing drawbacks.

AUTHORS' CONTRIBUTIONS

E.G. and E.G.: Conceptualization; E.G., M.M., M.M. and K.M.: Methodology; E.G. and E.G.: Software; E.G., M.M. S.A. and D.R.: Validation; E.G. M.M., and K.M.: Formal analysis; E.G. M.M., D.R. and S.A.: Investigation; E.G. and M.M.: Resources; E.G., M.M, S.A. and D.R.: Data curation; E.G and M.M.: Writing—original draft preparation; E.G., M.M., K.M., S.A., D.R., R.A. K.K.A. A.A.A.M. and M.M.A.L.: Writing—review and editing; E.G. and M.M.: Visualization; M.M.: Supervision; R.A., K.A. and A.A.A.M.: Project administration. All authors have read and agreed to the published version of the manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study protocol was obtained from the ethics committee of the School of Dental, Health and Care Professions, Faculty of Science and Health University of Portsmouth (SDHCP 2025-003B).

HUMAN AND ANIMAL RIGHTS

All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

CONSENT FOR PUBLICATION

All participants were briefed regarding the purpose of the study and the direct or indirect benefits that they

would receive from its implementation. Anyone was allowed to refuse to participate before they provided written consent for the study.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data and supportive information are available within the article.

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CONFLICT OF INTEREST

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