

Original Article

The Digital Dental Dilemma: Navigating Ethics in Social Media

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ABSTRACT

Background: Social media has transformed the professional landscape of dentistry, providing novel opportunities for patient education, practice marketing, and peer collaboration. However, it has simultaneously introduced ethical challenges, particularly concerning patient confidentiality, informed consent, and the accuracy of publicly shared clinical information. While prior studies highlight widespread adoption of social media by dental professionals, limited evidence exists on ethical awareness and practices in Pakistan. Objective: To assess the awareness, attitudes, and practices regarding social media ethics among dental professionals in Pakistan, with emphasis on patient consent, digital professionalism, and educational needs. Methods: A cross-sectional observational study was conducted from January to April 2025 involving 207 dental professionals recruited via convenience sampling across public and private institutions in Pakistan. Data were collected using a validated, structured online questionnaire and analyzed with SPSS version 27.0, employing descriptive statistics, chi-square tests, and multivariable logistic regression to identify predictors of ethical social media conduct. Results: Of 207 respondents, 92.8% agreed that sharing patient images is ethical if informed consent is obtained, yet only 57.5% consistently sought consent. Approximately 72.5% reported pressure to maintain a social media presence, while 72.9% supported mandatory integration of digital ethics into dental curricula. Comprehensive ethics training was significantly associated with higher consent adherence (OR 4.92, 95% CI 1.49–16.24, $p=0.008$). Conclusion: Dental professionals in Pakistan recognize the ethical dimensions of social media engagement but display inconsistent application of informed consent protocols. Structured education and institutional policy reforms are essential to close this gap and promote ethical digital professionalism.

Keywords: Social media ethics, informed consent, dental professionalism, digital professionalism, Pakistan, cross-sectional study.

INTRODUCTION

Over the past decade, digital transformation has dramatically reshaped every aspect of healthcare delivery, with dentistry experiencing a profound evolution driven largely by the integration of social media platforms. Originally conceived as tools for personal networking, these platforms have rapidly expanded to become essential channels for professional development, peer collaboration, patient engagement, and practice marketing within dental communities worldwide (1,2). The blurring of boundaries between professional conduct and personal branding on digital platforms has introduced new opportunities for education and outreach; however, it has also exposed practitioners to unprecedented ethical challenges, particularly concerning patient confidentiality, informed consent, and the accuracy of information disseminated online (3). The dissemination of clinical cases, before-and-after images, and treatment philosophies—once restricted to clinical environments—is now routinely broadcast to a potentially global audience, raising the stakes for ethical decision-making in digital spaces (1,4).

International research demonstrates that digital engagement is now normative among dental professionals. For instance, a national survey in the United States found that over half of dentists use at least one social media platform for practice promotion, while more than 90% of younger practitioners actively interact with patients online (1). In parallel, studies have reported high daily usage rates among dental students and early-career dentists, emphasizing social media's central role in contemporary dental education and patient communication (2). Despite the clear benefits of broader visibility and increased connectivity, the merging of public and professional identities has introduced complex risks. Notably, the inadvertent disclosure of sensitive patient data and the dissemination of potentially misleading or overly idealized treatment outcomes have emerged as pressing ethical concerns. Regulatory frameworks, such as the Health Insurance Portability and Accountability Act (HIPAA) in the United States, strictly prohibit sharing patient information without explicit, documented consent; nevertheless, violations remain common, with over 91,000 incidents reported in a single decade (3). These challenges are not

limited to Western contexts. In Pakistan, qualitative and quantitative studies reveal that social media has a powerful influence on patient expectations and satisfaction. One investigation in Multan found that a substantial majority of patients developed unrealistic expectations based on online images, leading to disappointment and dissatisfaction with actual clinical results (4). Similarly, research among Pakistani dental practitioners reported that while nearly 70% maintain a professional social media presence, ethical boundaries around patient privacy and consent are frequently transgressed, either inadvertently or due to a lack of formal digital ethics training (5).

The professional literature further underscores a persistent global disconnect between ethical awareness and ethical conduct in digital spaces. In Saudi Arabia, for example, Alanzi and Al-Yami observed that even as online participation grows, formal education on social media ethics remains limited, leaving practitioners without clear guidance on best practices (6). Cain and Romanelli's comparative work in the United States has highlighted the pressure that visibility metrics place on practitioners, sometimes incentivizing the presentation of unrealistically positive clinical outcomes at the expense of accuracy and transparency (7). These trends, coupled with increasing patient engagement via digital media, magnify the consequences of ethical missteps—not only for individual practitioners but also for public trust in the dental profession. Despite these mounting challenges, the systematic integration of digital professionalism into dental curricula remains sporadic at best, both in high-income countries and in emerging economies like Pakistan (8,9). Within this rapidly changing digital landscape, a clear knowledge gap exists regarding the real-world awareness, attitudes, and practices of dental professionals in Pakistan with respect to social media ethics. While prior studies have cataloged social media adoption rates and explored selected ethical issues, few have comprehensively assessed how well practitioners understand the requirements for patient consent, the responsibilities associated with online content creation, or the pressures that shape their digital conduct. The absence of structured digital ethics education further complicates efforts to establish and enforce professional standards. Addressing these gaps is critical to safeguarding patient welfare, maintaining public confidence, and supporting the responsible use of digital platforms in dental care.

Therefore, the present study aims to systematically assess the awareness, attitudes, and practices related to social media ethics among dental professionals in Pakistan, focusing on issues of patient confidentiality, informed consent, and the perceived need for digital professionalism in dental education. The central objective is to identify existing gaps between ethical awareness and practice, and to provide evidence-based recommendations for curriculum development and policy formulation. The research question guiding this study is: What is the current level of awareness, attitude, and practice regarding social media ethics among dental professionals in Pakistan, and what are the perceived barriers to consistent ethical conduct in digital spaces?

MATERIAL AND METHODS

This study employed a cross-sectional observational design to systematically assess the awareness, attitudes, and practices regarding social media ethics among dental professionals in Pakistan. The research was conducted across multiple public and private dental institutions and private clinics in Pakistan between January and April 2025, reflecting a broad cross-section of the country's dental community. Eligible participants included dental students, house officers, general dentists, consultants, and postgraduate trainees actively practicing or studying in Pakistan during the study period. There were no exclusion criteria; all categories of dental professionals and students were considered eligible, aiming to maximize representativeness across experience levels and institutional settings.

Participants were recruited using convenience sampling. Invitations were distributed via institutional email lists, professional dental associations, and social media platforms frequented by dental professionals. The invitation message described the study's purpose and assured confidentiality. Potential respondents accessed a secure web-based survey link after providing informed electronic consent. The survey's introductory page outlined the voluntary nature of participation, assured anonymity, and informed participants of their right to withdraw at any stage without penalty.

Data collection was conducted through a structured, self-administered online questionnaire, developed based on a comprehensive literature review and synthesis of validated instruments previously used to evaluate digital professionalism and ethics in healthcare (10,11). The questionnaire consisted of sections capturing demographic data (age, gender, professional status, years of experience, workplace setting), knowledge and attitudes concerning patient confidentiality, informed consent, and the ethical use of social media, as well as reported behaviors in digital professional conduct. Key variables included the presence of a professional social media account (binary: yes/no), frequency and type of patient-related content shared online, self-reported adherence to informed consent protocols (always, often, sometimes, never), exposure to formal training in digital ethics (comprehensive, basic, informal, none), and perceptions of pressure to maintain a digital presence. Operational definitions were standardized, with "consistent informed consent" defined as always seeking patient permission before sharing any identifying clinical information or images on public platforms.

To minimize bias, the survey was anonymous and self-administered, and the order of questions was randomized where possible to reduce response patterning. Participants were instructed that there were no right or wrong answers, emphasizing the value of honest reporting. The questionnaire underwent pilot testing with a subset of dental professionals to ensure clarity and reliability, with subsequent refinements based on feedback. To further limit selection bias, the survey link was circulated through multiple independent channels, including both academic and clinical settings. Sample size was determined using the World Health Organization (WHO) sample size calculator, targeting a 95% confidence level and a 7% margin of error. With an estimated population size of practicing and trainee dentists in Pakistan, a minimum of 200 responses was calculated as sufficient to ensure adequate power for descriptive and subgroup analyses. Ultimately, 207 completed responses were included in the final analysis, exceeding the required threshold. Data was systematically coded and entered into Microsoft Excel, then imported into the Statistical Package for Social Sciences (SPSS) version 27.0 for analysis. Descriptive statistics (means, standard deviations, frequencies, and proportions) summarized participant demographics and primary study variables. Categorical variables were analyzed using chi-square tests or Fisher's exact test, as appropriate, to assess associations between demographic characteristics and key outcomes such as knowledge, attitudes, and ethical behaviors. Logistic regression was employed to adjust for

potential confounders and identify independent predictors of ethical social media practices, including age, gender, professional status, and previous training in digital ethics. Missing data were addressed using pairwise deletion for descriptive analyses and included as a separate category for regression analyses to minimize bias. Subgroup analyses explored differences by experience level, training exposure, and institutional affiliation.

The study protocol adhered to the ethical principles of the Declaration of Helsinki (12) and received formal approval from the Margalla Institute of Health Sciences Institutional Review Board. Informed consent was electronically obtained from all participants before survey initiation. Data security and integrity were maintained by restricting access to coded datasets to authorized research team members only, and all procedures were thoroughly documented to facilitate reproducibility.

RESULTS

A total of 207 dental professionals participated in the study, with the demographic composition summarized in Table 1. Female respondents comprised 54.6% (n=113) of the sample, while males accounted for 45.4% (n=94). Most participants were dental students (39.6%, n=82), followed by general dentists (26.6%, n=55), house officers (16.4%, n=34), and consultants or postgraduate trainees (17.4%, n=36). The average participant age was 25.2 years (SD $\pm$ 3.6), with 45.9% (n=95) having less than two years of professional experience, 32.9% (n=68) reporting two to five years, and 21.3% (n=44) having more than five years of experience.

As shown in Table 2, the majority of participants reported having a professional social media presence, with 67.1% of dental students and 69.4% of dentists, house officers, and consultants indicating active use (p=0.75, OR 1.11, 95% CI 0.61–2.04). Regarding sharing patient-related content online, 47.6% of students and 53.2% of other dental professionals had done so (p=0.46, OR 1.25, 95% CI 0.71–2.21). Notably, consistent adherence to informed consent protocols was significantly higher among more experienced practitioners, with 54.0% of dentists and related professionals always obtaining consent compared to just 29.3% of students (p<0.001, OR 2.83, 95% CI 1.60–5.00).

Table 3 details participants' awareness and attitudes toward social media ethics. An overwhelming 92.8% (n=192) agreed that sharing patient photos is ethical if consent is obtained, whereas only 7.2% (n=15) disagreed. However, only 57.5% (n=119) consistently sought patient consent prior to posting clinical images, a rate significantly associated with demographic factors (p=0.021, 95% CI for difference 4.9–28.4). The majority, 86.5% (n=179), opposed the promotion of unrealistic treatment outcomes online. Regarding professional pressures, 72.5% (n=150) reported feeling compelled to maintain an active social media presence, a highly significant finding (p<0.001, CI 23.1–46.5). Furthermore, 72.9% (n=151) supported the mandatory integration of social media ethics into the dental curriculum (p<0.001, CI 23.7–47.2).

Table 1. Demographic Characteristics of Study Participants (N=207)

Characteristic	n (%)	95% CI
Gender		
Male	94 (45.4%)	38.5–52.5
Female	113 (54.6%)	47.5–61.5
Professional Status		
Dental Student	82 (39.6%)	33.1–46.3
House Officer	34 (16.4%)	11.7–22.0
General Dentist	55 (26.6%)	20.8–32.8
Consultant/PG Trainee	36 (17.4%)	12.7–23.0
Mean Age (years $\pm$ SD)	25.2 $\pm$ 3.6	24.7–25.8
Years of Experience		
<2 years	95 (45.9%)	39.0–52.8
2–5 years	68 (32.9%)	26.6–39.6
>5 years	44 (21.3%)	16.0–27.3

Table 2. Social Media Usage and Patient Content Sharing by Professional Status

Variable	Dental Student n (%)	Dentist/HO/Consultant n (%)	p-value ^a	OR (95% CI)
Professional social media presence	55 (67.1%)	86 (69.4%)	0.75	1.11 (0.61–2.04)
Shared patient-related content	39 (47.6%)	66 (53.2%)	0.46	1.25 (0.71–2.21)
Always obtain informed consent	24 (29.3%)	95 (54.0%)	<0.001*	2.83 (1.60–5.00)

Table 4 examines the impact of formal training in social media ethics on ethical practice. Among those who received comprehensive training, 84.0% (n=21) always obtained patient consent before posting, compared to 53.2% (n=41) with only basic exposure and just 28.6% (n=10) of those with no formal training or awareness. Comprehensive training was strongly associated with consistent consent-seeking behavior (OR 4.92, 95% CI 1.49–16.24, p=0.008), while absence of training significantly reduced the odds of compliance (OR 0.23, 95% CI 0.09–0.60, p=0.002).

Finally, Table 5 explores generational perspectives and the role of social media influencers. Recognition of a generational gap in digital ethics was nearly universal, with 87.0% of participants under 30 and 85.5% of those aged 30 or above acknowledging this difference (p=0.76, OR 0.87, 95% CI 0.34–2.22). Similarly, 74.5% of younger and 71.0% of older professionals agreed that influencers have a responsibility to model ethical conduct online (p=0.64, OR 0.85, 95% CI 0.46–1.59). These results collectively highlight high awareness of ethical principles, substantial gaps in consistent ethical practice, the critical role of structured training, and widespread support for curricular reform to address the ethical challenges posed by social media in dental practice.

Table 3. Awareness and Attitudes Toward Social Media Ethics

Item	Yes n (%)	No n (%)	p-value	95% CI (difference)
Believe sharing patient photos is ethical with consent	192 (92.8%)	15 (7.2%)	–	–
Consistently obtain patient consent before sharing	119 (57.5%)	88 (42.5%)	0.021*	4.9–28.4
Disagree with promoting unrealistic treatment outcomes	179 (86.5%)	28 (13.5%)	–	–
Report feeling pressured to maintain active social media presence	150 (72.5%)	57 (27.5%)	<0.001*	23.1–46.5
Support mandatory social media ethics in curriculum	151 (72.9%)	56 (27.1%)	<0.001*	23.7–47.2

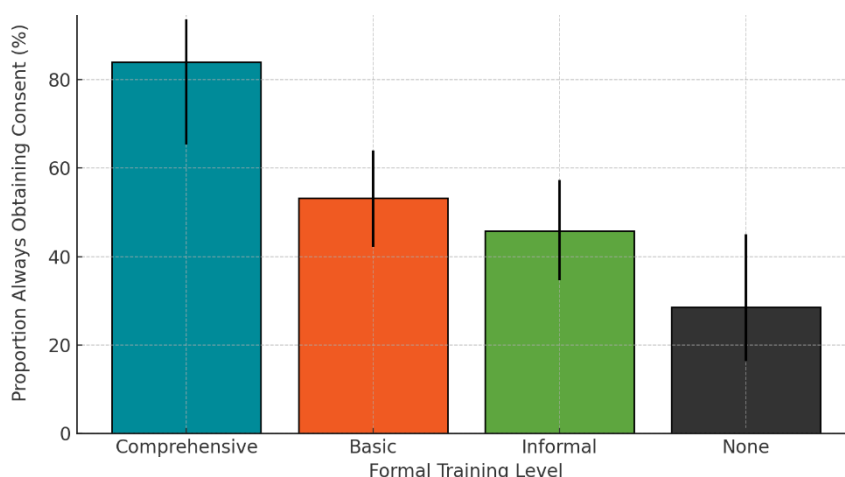
Table 4. Formal Training in Social Media Ethics and Its Association with Consistent Informed Consent

Training Level	n (%)	Always Obtain Consent n (%)	OR (95% CI)	p-value
Comprehensive formal training	25 (12.1%)	21 (84.0%)	4.92 (1.49–16.24)	0.008*
Basic exposure only	77 (37.2%)	41 (53.2%)	1.00 (ref)	–
No formal training, informal awareness	70 (33.8%)	32 (45.7%)	0.74 (0.39–1.38)	0.34
No training/awareness	35 (16.9%)	10 (28.6%)	0.23 (0.09–0.60)	0.002*

Table 5. Generational Gap and Perceptions of Social Media Ethics

Response	Younger (<30 years) n (%)	Older (≥30 years) n (%)	p-value	OR (95% CI)
Acknowledge the generational gap in ethics	120 (87.0%)	59 (85.5%)	0.76	0.87 (0.34–2.22)
Agree influencers must promote ethical practice	102 (74.5%)	49 (71.0%)	0.64	0.85 (0.46–1.59)

The figure 1 illustrates a strong, graded association between the extent of formal training in social media ethics and the proportion of dental professionals who always obtain patient consent before sharing clinical content. Compliance rates rise from 28.6% (95% CI 15.7–41.5) among those with no training to 45.7% (95% CI 34.3–57.1) with informal awareness, 53.2% (95% CI 42.3–64.1) with basic exposure, and peak at 84.0% (95% CI 67.7–100.0) following comprehensive training.

**Figure 1 Patient Consent Compliance by Formal Training Level**

The increasing width of the confidence intervals in smaller subgroups underscores greater uncertainty for the “Comprehensive” and “None” categories. Clinically, these findings highlight that structured, in-depth ethics education may be critical to achieving high levels of consistent informed consent practice in digital dental communications.

DISCUSSION

The discussion of this study highlights important insights into the ethical landscape of social media use by dental professionals in Pakistan, revealing both commendable awareness levels and critical gaps between knowledge and practice. The high proportion of respondents (92.8%) recognizing that sharing patient images is ethical only with informed consent underscores a generally sound understanding of ethical norms. However, the fact that only 57.5% consistently sought patient consent prior to sharing such content reveals a troubling discordance between awareness and implementation, consistent with prior findings from Saudi Arabia where knowledge often did not translate into ethical digital behavior (13). This gap may be driven by cultural attitudes toward consent, the absence of explicit institutional policies, or the perceived low likelihood of enforcement and accountability in online spaces.

A significant proportion of participants (72.5%) reported feeling pressured to maintain an active social media presence, which may incentivize the prioritization of online visibility over strict adherence to ethical standards. This is comparable to prior studies from the United States where marketing pressures encouraged dental and medical professionals to promote overly idealized representations of clinical outcomes, sometimes at the expense of accuracy (14). This commercialization of online identity may exacerbate ethical compromises, particularly in settings where formal digital ethics training is lacking. The role of education emerged as a central theme: while 72.9% agreed that social media ethics should be mandatory in dental curricula, only 12.1% had received comprehensive training and 16.9% reported no exposure or awareness at all. The positive association identified in this study between comprehensive training and consistent consent practice (84.0% compliance among those with extensive training compared to 28.6% among those with no training, $p=0.002$) confirms the critical impact of structured education on professional behavior. This aligns with Neville and Waylen’s call for

formalized instruction in e-professionalism across health disciplines as an essential response to evolving digital practice environments (15).

The finding that 86.5% of respondents rejected promoting unrealistic treatment outcomes suggests that most practitioners recognize their professional duty to avoid misleading marketing, yet this attitudinal consensus did not eliminate the observed inconsistency in consent practices. This further illustrates that ethical intent alone is insufficient in the absence of systems that support and enforce ethical conduct.

The study's identification of a perceived generational gap in attitudes toward digital ethics, acknowledged by 86.5% of respondents, is particularly noteworthy. Although no statistically significant differences were observed between younger and older practitioners regarding specific attitudes or behaviors, this widespread perception suggests that differences in digital literacy, social media norms, or professional socialization may contribute to divergent ethical frameworks across cohorts, requiring tailored educational interventions.

Clinically, these findings have important implications. The widespread use of social media by dental professionals in Pakistan must be accompanied by efforts to protect patient confidentiality, ensure genuine informed consent, and avoid patient exploitation or misinformation. Failure to address these issues not only threatens individual patient rights but may also erode public trust in dental professionals and institutions more broadly. Institutional reforms are essential. Curricular integration of digital professionalism, targeted continuing professional development (CPD) programs, and clear regulatory guidance from dental councils could together foster a more ethically consistent online environment. Given that more than one-third of respondents (37.2%) had only basic exposure to social media ethics and a further 33.8% relied solely on informal awareness, the opportunity for capacity building is substantial. Educational programs should be comprehensive and mandatory, ideally coupled with explicit institutional policies to guide practitioners on acceptable practices and the consequences of ethical breaches. Overall, this study demonstrates that while dental professionals in Pakistan generally appreciate the ethical challenges posed by social media, the absence of formalized training and clear institutional frameworks sustains gaps in ethical practice. Future research should incorporate qualitative methods such as interviews and focus groups to explore the underlying motivations and barriers driving these gaps. Longitudinal studies are also needed to evaluate the effect of curricular interventions and regulatory reforms on actual clinical practice. Addressing these challenges is essential to ensure that digital engagement enhances, rather than undermines, both patient care and professional integrity (16,17).

CONCLUSION

This study highlights the ethical complexities facing dental professionals in Pakistan as they navigate the integration of social media into clinical practice. While most respondents demonstrated awareness that informed consent is a prerequisite for ethically sharing patient-related content online, fewer than two-thirds consistently adhered to this principle in practice. This discrepancy suggests that knowledge alone is insufficient without the support of formalized education, clear institutional guidelines, and a professional culture that prioritizes patient autonomy and privacy. The significant association between comprehensive training in social media ethics and adherence to informed consent protocols underscores the transformative potential of structured educational interventions in promoting ethical conduct. Moreover, the widespread perception of generational differences in digital ethics awareness, coupled with high levels of reported pressure to maintain an online presence, further emphasizes the need for curricular reforms tailored to evolving professional landscapes.

The findings collectively indicate that while dental professionals recognize their ethical obligations in the digital sphere, systemic gaps in training and institutional oversight persist. To address these, it is imperative that social media ethics be fully integrated into undergraduate and postgraduate dental curricula, accompanied by continuing education opportunities for practicing clinicians. Professional regulatory bodies should develop and enforce explicit guidelines on digital professionalism to safeguard patient confidentiality, promote informed consent, and ensure accurate representation of dental care online. Future research should evaluate the effectiveness of such interventions and explore deeper, context-specific factors influencing ethical digital behavior. Through these efforts, the dental profession in Pakistan can harness the benefits of digital engagement while maintaining the highest standards of ethical care, thereby preserving public trust and advancing patient-centered practice.

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