

Digital engagement in dentistry: Exploring social media adoption among Klang valley dentists through TAM

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Abstract: This study explores the factors affecting dentists' willingness to use social media in their practices, examining how consumer behavior influences their adoption decisions. Despite the growing use of social media across industries, its adoption in dentistry remains relatively underexplored. As investments in digital technologies increase, understanding dentists' intentions to integrate social media becomes crucial, especially considering the evolving consumer behavior patterns in healthcare. Using the Technology Acceptance Model (TAM) and factoring in patient pressures, this study analyzes data from 209 respondents through SPSS and Smart PLS 4.0. The results offer valuable insights for dentists, highlighting the benefits of social media integration, and justifying investments in these platforms to align with changing consumer expectations. The study also discusses its limitations and suggests future research directions to further explore social media adoption in dentistry and its potential to drive economic growth within the sector.

Keywords: social media adoption; dentistry; technology acceptance model (TAM)

1. Introduction

Social media can perform as the activities and practices to communicate with people online to share the information, knowledge and opinions using conversational media (Karimi and Naghibi, 2015; Kukreti et al., 2024). There are plenty platforms of social media such as Facebook, Twitter, YouTube, LinkedIn, Blogs and others (Althunayan et al., 2018; Amin, 2016). Social media has dramatically changed the pattern of living in today's world. Therefore, it is a great opportunity for all industries to promote their products and services to their targeted customers (Hanafizadeh et al., 2021; Hassan et al., 2015) and also to create a good relationship with them to gains the competitive advantage (Razak et al., 2016). This online communication has changed the way of interactive and collaborative between the organisations and publics (Valos et al., 2016). Besides that, many industries have been using social media for their marketing practices in Malaysia. As a result, Malaysia is one the largest user of social media in the Southeast Asian Region (Shahizan et al., 2012) and it is not a new phenomenon in Malaysia (Hassan et al., 2015).

Social media has become an integral part to all industries included healthcare industry dentistry field. For example, the benefits of social media could change the way of communication between dentists and patients and deliver different types of dental care services to them (Parmar et al., 2018). It able to create a new pave to engage with their patients to share and exchange the dental care information through their connections while advertise their dental expertise (Kazley et al., 2016). However,

dentists are still struggling to use social media to communicate with their patients, deliver the information of dental care and promote their specialization in Malaysia (Hamasha et al., 2019; Yousuf et al., 2017). It has been proved that the usage of social media marketing by dentists is very low which was stated less than 15% (Hafizah et al., 2020).

2. Literature review

The role of social media in dentistry has become increasingly significant, as dental practices continue to leverage these platforms to interact with patients, enhance visibility, and promote services. Social media platforms, including Facebook, Instagram, and LinkedIn, have become integral tools for dentists, offering a direct way to engage with patients and foster professional relationships (Aguiar et al., 2020; Nihon et al., 2021). Social media's benefits include broadening a practice's reach, improving patient education, and providing a platform for patient reviews and testimonials, which enhance credibility (Henderson et al., 2022; Kumar et al., 2021). However, these platforms also pose challenges, such as maintaining professionalism while engaging with patients in informal settings (Adnan et al., 2022; Evetts, 2021).

Despite its advantages, social media use in the dental profession is often met with resistance. Dentists face challenges in maintaining appropriate professional boundaries while participating in informal online interactions (Jhanji et al., 2021; Lodhi et al., 2021). For example, while social media provides an opportunity for greater patient engagement, it also exposes practitioners to risks related to privacy, ethical concerns, and the potential for unprofessional behavior (Bhatti et al., 2020). The blurred lines between personal and professional identities on social media often lead to hesitation among dental practitioners about fully adopting these platforms (Aboalchamat et al., 2021; Goh et al., 2020).

A prominent concern for dentists is privacy, with research indicating that personal information shared on social media can be easily accessible, which may result in professional risks (Amin et al., 2022; Holden et al., 2021). This concern about patient confidentiality and maintaining professional conduct has led some practitioners to limit their social media engagement (Mubarak et al., 2021). A recent study by Ali et al. (2023) found that 68% of dentists were hesitant to accept patient requests on social media due to the potential for compromising professional boundaries. Similarly, concerns over the potential for unprofessional behavior, such as the public sharing of personal content, have deterred dentists from fully embracing social media (Adnan et al., 2022).

The age of the dentist also plays a role in determining social media usage. Younger dentists, particularly those aged 25–35, are more likely to adopt social media for professional purposes compared to older colleagues (Kumar et al., 2020; Pott et al., 2021). This generational gap reflects differing attitudes toward digital tools, with younger dentists more comfortable navigating social media platforms to promote their practices and engage with patients (Ali et al., 2021; Henderson et al., 2022). According to Lee et al. (2022), 45% of dentists aged 30–40 use social media regularly for practice promotion, compared to just 19% of dentists aged 50 and above. This trend

underscores the growing trend of younger dentists embracing social media as a means of fostering stronger connections with their patient base (Goh et al., 2020).

Moreover, social media offers opportunities for increased income generation, especially in regions where dentists may face salary constraints. In Malaysia, where salaries for dental practitioners are often seen as inadequate (Saad et al., 2022), social media provides a cost-effective way to boost income through increased patient acquisition and enhanced service visibility (Aboalchamat et al., 2021). Social media platforms allow dentists to exhibit their expertise, promote special offers, and share patient testimonials, thus increasing their practice's exposure and attracting new patients (Bhatti et al., 2020; Nihon et al., 2021).

Despite the many benefits, the adoption of social media in dentistry is still hindered by concerns related to privacy, professionalism, and ethical considerations (Ghazali et al., 2022; Kumar et al., 2021). Furthermore, there is a noticeable gap in research on dentists' intention to adopt social media in Malaysia. While studies have addressed social media use in healthcare (Jhanji et al., 2021; Pott et al., 2021), specific research targeting Malaysian dental professionals remains sparse (Amin et al., 2022; Lee et al., 2022). **Table 1** below illustrates the limited number of studies published on this topic from 2011 to 2023, highlighting the need for more research in this region.

Table 1. Number of journals published from 2011 to 2023.

Year	Number of journals published
2011	1
2012	2
2013	3
2014	1
2015	2
2016	2
2017	3
2018	4
2019	1
2020	1
2021	1
2022	1
2023	2

Source: Science direct.

Given the lack of research, this study aims to explore the factors influencing social media adoption among dentists in Klang Valley, Malaysia, using the Technology Acceptance Model (TAM). TAM has been widely used in research on technology adoption across various industries, including healthcare (Goh et al., 2020; Jhanji et al., 2021). According to Davis (1989), the two key factors in TAM, perceived ease of use (PEOU) and perceived usefulness (PU), significantly influence individuals' decisions to adopt new technologies. In this context, PEOU refers to the ease with which dentists can use social media platforms for marketing purposes, while PU relates to the perceived benefits of social media in enhancing practice visibility,

increasing patient engagement, and fostering professional growth (Amin et al., 2022; Kumar et al., 2020).

In this study, we hypothesize that PEOU and PU play a pivotal role in dentists' intention to adopt social media. Aboalchamat et al. (2021) found that the more dentists perceive social media as easy to use and beneficial for promoting their practice, the more likely they are to adopt these platforms. Furthermore, Dentists' intention to use social media for marketing activities is expected to be influenced by patient demand and the desire for increased professional visibility (Kumar et al., 2020; Nihon et al., 2021).

The four hypotheses are drawn based on literature review:

H1: Customers' (patients') pressure positively influenced by performance of social media to use social media for their marketing activities.

H2: PEOU positively influences intention of dentists to use social media for their marketing activities.

H3: PU positively influences intention of dentists to use social media for their marketing activities.

H4: Intention of dentists positively influenced by performance of social media to use social media for their marketing activities.

3. Research methodology

This research adopts a cross-sectional analytical design to explore the acceptance of social media among dentists in Klang Valley, Malaysia. The study specifically targets licensed dentists registered with the Malaysian Dental Association (MDA), as they are actively engaged in dental practice and patient care. As of 2023, there are 9699 people practicing dentists in Malaysia, with a division between the public (6455 people) and private (3244 people) sectors, as reported by the Malaysian Dental Council (2024). Furthermore, there are 1118 dental students, underscoring the potential for social media to play an increasing role in the future of dentistry (Parmar et al., 2018). Social media platforms have become critical tools for dentists to connect with patients, promote services, and share clinical expertise, a trend that has gained traction globally (Feng et al., 2023; Hossain et al., 2023).

Participants in this study are selected based on their professional engagement in dental practice. Only licensed dentists who are actively involved in patient care will be included in the study. This ensures that the data collected represents individuals with practical experience in integrating social media into their clinical practice. Dental specialists will also be considered, as their expertise and exposure to social media can provide valuable insights. On the other hand, dental students, interns, and those in administrative roles will be excluded, as they do not meet the criteria of regularly using social media for direct patient care (Amin, 2022; Gangwar et al., 2022).

To collect data, a self-administered questionnaire will be used, drawing on established scales and constructs from the Technology Acceptance Model (TAM) (Davis, 1989), which has been widely applied to study technology adoption in healthcare (Chien et al., 2023; Zhao et al., 2022). The questionnaire consists of two sections:

Section A gathers demographic information, such as age, gender, dental specialty, sector of employment, and working hours per week.

Section B contains 30 items to assess the usage and impact of social media on dental practices. Items in Section B are derived from previous studies on social media adoption in healthcare and dental settings (Amin, 2016; Gangwar et al., 2015; Karahoca et al., 2017; Zolkepli and Kamarulzaman, 2015). These items include questions about the platforms dentists use, how they integrate social media into their patient care, and their perceptions of its effectiveness in practice (Wang and Liang, 2022). The scale is based on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree), allowing for the measurement of attitudes and behaviors toward social media adoption (Garland, 1991; Jiang et al., 2023).

To ensure the validity of the questionnaire, it will first undergo a content validation process. The initial draft will be sent to 10 experienced dentists to evaluate the relevance and clarity of the items. Their feedback will be used to revise the instrument to ensure that it accurately captures the intended constructs (Kumar et al., 2023). Following content validation, a pilot test will be conducted with 30 dentists to further refine the questionnaire. Pilot testing will help identify any ambiguities or confusion in the questions and ensure that respondents understand the items as intended (Koul et al., 2023; Kumar et al., 2013). Any necessary modifications will be made based on pilot feedback to improve the instrument's reliability.

Once finalized, the questionnaire will be distributed to 300 dentists via an online survey platform (Google Forms). The online distribution method is preferred due to its ability to reach a diverse group of participants across the Klang Valley in a cost-effective and timely manner (Patil and Yadav, 2023). The survey will be shared through email and social media platforms like Facebook, which are commonly used by dental professionals for networking and knowledge sharing. This approach maximizes the reach and response rate, aligning with findings from recent studies that suggest social media is an effective tool for engaging healthcare professionals (Liu et al., 2023; Hossain et al., 2023).

A purposive sampling technique will be employed to select dentists who meet the study's criteria. Purposive sampling is appropriate in cases where researchers seek participants with specific characteristics or expertise, which in this case are experienced dentists who use social media in their practice (Rowley, 2014). This technique allows for a more focused exploration of social media adoption in a specialized professional group. The sample will be limited to dentists practicing in the Klang Valley, which is the primary healthcare hub in Malaysia, thus ensuring that the results are relevant to the context of urban dental practices. Purposive sampling is commonly used in healthcare research, particularly when studying specialized professionals, as it provides direct access to the individuals who can offer insights into the research topic (Brown and Green, 2022; Zhang et al., 2023).

The required sample size for this study is 300 dentists, calculated based on the ten-times rule (Barclay et al., 1995), which recommends a sample size that is at least ten times the number of structural paths in the model. This study proposes a 21-path structural model, so the minimum required sample size is 210 respondents. Given that SEM analysis can be sensitive to sample size, the study will aim for a slightly larger sample size of 300 respondents to ensure adequate statistical power and reliability in

the analysis (Hair et al., 2017; Memon et al., 2023). According to Hair et al. (2017), a sample size of at least 100 respondents is necessary for reliable results in structural equation modeling (SEM), which further justifies the chosen sample size.

The data from Section A (demographics) will be analyzed using SPSS to generate descriptive statistics and summarize the characteristics of the sample. Descriptive statistics are essential for understanding the background of the respondents and ensuring that the sample accurately represents the target population. The data from Section B will be analyzed using SmartPLS 4.0, a Partial Least Squares Structural Equation Modeling (PLS-SEM) tool that is well-suited for analyzing complex models with multiple constructs and path relationships (Hair et al., 2017). PLS-SEM is particularly appropriate for studies with smaller sample sizes and exploratory research, such as this one, which seeks to understand the factors influencing social media adoption in dental practice (Chen et al., 2023; Ringle et al., 2023). The PLS-SEM technique will be used to test the relationships between perceived ease of use, perceived usefulness, and the adoption of social media in dental practice.

In conclusion, the quantitative methodology used in this study will provide a comprehensive and rigorous examination of social media adoption by dentists in Malaysia. By utilizing TAM-based scales, purposive sampling, and PLS-SEM, this study aims to offer insights into the factors that drive social media use in the dental profession and its perceived impact on dental practice and patient care. The integration of the latest research on technology adoption in healthcare and dentistry (Feng et al., 2023; Hossain et al., 2023) further strengthens the theoretical and empirical foundation of the study.

4. Result and discussion

Based on 300 respondents, only 209 are responded within three months. The demographic profile of the respondents is presented in **Table 2**. The demographic data found that there were 157 female and 52 male respondents. Most respondents were from age group 26 to 35 years old and 34.4% of the total population. Moreover, only 93 out of 209 of them are specialize in dental services while majority of them are attached in private sector. Their income range is between from RM3001 to RM5000 and their working hours per week is 54 to 66 h. It shows that the average working hour per day is 11 h with poor salary offered.

The random use of the convenient sampling method was being used for the data completion for this study. The convenience sampling method is a sampling method which takes the most efficiently collected sample (Hair et al., 2019). The online questionnaire was distributed to 300 dentists in Klang Valley by using Google forms and 209 of them are responded. The Smart PLS 4.0.9.5 programme is used to analyse the data as the Partial Least Square-Structural Equation Modelling (PLS-SEM) is a method to confirm the structural equation models and to test the link between inert developments (Hair et al., 2019). Furthermore, it can be used to test the hypotheses and quantify the path coefficients in structural models (Hair et al., 2019).

Table 2. Demographic part.

Variable	Category	Number	Percentage (%)
Age	25 years and below	4	1.9
	26 to 35 years	72	34.4
	36 to 45 years	67	32.1
	46 to 55 years	58	27.8
	56 years and above	8	3.8
Gender	Male	52	24.9
	Female	157	75.1
Dental speciality	General practitioners	116	55.5
	Specialists	93	44.5
Working sector	Government	183	87.6
	Private	26	12.4
Monthly income	RM3000 and below	18	8.6
	RM3001–5000	145	69.4
	RM5001–7000	44	21.1
	RM7001 and above	2	0.9
Hours worked per week	Less than 40 h	5	2.4
	41 to 53 h	29	13.9
	54 to 66 h	173	82.8
	67 h and above	2	0.9

Based on **Table 3**, the indicator loadings for all items are above 0.708; composite reliability and AVE for each said constructs are reported above 0.70 and 0.50 respectively. This analysis is arranged as solid and fulfilled the validity criteria. The issue is raised by the investigations are reliable where it's based on the composite reliability and cronbach's alpha values for each said construct having an incentive above 0.70. With this, the investigation met the requirements to test the model measurements. Besides that, the Monte Carlo tests are also carried out to test the validity of separation. The results are shown in **Table 4**.

Two different ways to access effectiveness can be done via HTMT; first as a rule and the second as a measurable test. HTMT value is significantly different from 1.00 or a lower threshold value such as 0.85 or 0.90 where it indicates that the value of item correlations across constructs relative to the (geometric) as the mean value of the item correlations for the items measuring the same construct (Hair et al., 2019). Based on this thumb rule, the results show that there is no HTMT issue.

Table 3. Convergent validity.

Constructs	Items	Indicator loadings	CR	AVE	VIF
PEOU	PEOU1	0.850	0.939	0.794	2.267
	PEOU2	0.911			3.336
	PEOU3	0.915			3.586
	PEOU4	0.886			2.777

Table 3. (Continued).

Constructs	Items	Indicator loadings	CR	AVE	VIF
PU	PU1	0.910	0.970	0.803	4.708
	PU2	0.917			5.803
	PU3	0.888			4.295
	PU4	0.864			3.279
	PU5	0.884			3.959
	PU6	0.905			4.945
	PU7	0.925			6.268
	PU8	0.877			3.853
Customers' (Patients') pressure	CP1	0.902	0.943	0.806	3.163
	CP2	0.875			2.620
	CP3	0.925			3.957
	CP4	0.888			2.997
Intention	ATT1	0.903	0.952	0.832	3.187
	ATT2	0.918			3.668
	ATT3	0.916			3.553
	ATT4	0.912			3.412
Performance of social media	B1	0.838	0.975	0.779	4.104
	B2	0.825			3.675
	B3	0.899			4.844
	B4	0.888			5.356
	B5	0.874			5.194
	B6	0.903			6.731
	B7	0.876			4.259
	B8	0.877			4.208
	B9	0.910			5.380
	B10	0.906			5.160

Table 4. HTMT.

Constructs	Intention	Performance of social media	Customers' (patients') pressures	PEOU	PU
Intention	HTMT				
Performance of social media	0.879	HTMT			
Customers' (patients') pressures	0.858	0.875	HTMT		
PEOU	0.842	0.868	0.844	HTMT	
PU	0.862	0.844	0.805	0.812	HTMT

Table 5 presented the results of hypothesis. It also indicates the *t*-values and *p*-value for each hypothesis. The *t*-value and *p*-value should be greater than 1.96 and lesser than 0.05 respectively (Hair et al., 2019). Based on this guideline, all hypotheses H1, H2, H3, H4 are accepted. The R^2 and f^2 are also sufficient, as indicated by Hair et al. (2019) who states that R^2 of 0.75 is strong; 0.50 is moderate; 0.25 is weak and 0.02

is small; 0.15 is medium; 0.35 is large respectively. The effect size reported is small and medium only in this study.

Based on above results, PEOU and PU significantly influence intention of dentists to use social media for their marketing activities. Besides that, customers' (patients') pressures are also main indicator for dentists to use social media. In fact, there is also positive relationship between intention of dentists and performance of social media to use social media. With this result, it can be concluded that dentists prefer to use social media to expose their expertise such as educational background, work experience, skills and endorsements through social media platforms (Parmar et al., 2018; Yousuf et al., 2017). The norms and codes of the dentists' qualifications can increase their professional image. Therefore, dentists could maximize the usage of social media to demonstrate their capabilities and expertise among patients to create a good relationship. Besides that, patients would like to get some information about dentist's medical treatment before visiting in this digital age. Once they got information and visited the particular dentist, they may start sharing their experience to others via social media platforms where it creates online word-of mouth. Thus, it helps dentists to enhance the income, attract new patients to get the different types of dental services and maintain a good relationship with existing patients (Amin et al., 2016; Parmar et al., 2018).

However, dentists should follow the rule and regulation created by Malaysian Dental Council (2014). Dentists can create a Facebook page where they can post their operating hours, updates on health topics and testimonials from satisfied patients. These online activities can increase the availability of professional people online also has the effect of reducing the social distance that traditionally separated healthcare professionals from the public (Neville and Waylen, 2015). Most social media sites such as Facebook and Instagram have privacy settings where it helps dentists to limit the number of people access the content that dentists posted on social media platforms. If dentists find social media sites' privacy settings are easy and useful for them to control the messages of dental information to public, it will lead them to use the social media marketing for their dental practices (Neville and Waylen, 2015; Parmar et al., 2018).

Table 5. Hypothesis results.

	<i>t</i> -value	<i>p</i> -value	<i>R</i> ²	<i>f</i> ²	<i>Q</i> ²	Decision
Intention → Performance of social media	6.354	0.000	0.000	0.007	0.595	Supported
Customers' (patients') pressure → Performance of social media	5.359	0.000	0.000	0.045	0.593	Supported
PEOU → Intention	3.255	0.001		0.153		Supported
PU → Intention	4.820	0.000		0.035		Supported

5. Conclusion

5.1. Practical contribution to dentistry field

One of the most significant practical contributions of social media to dentistry is in the realm of patient education. Dentists and dental practices can leverage platforms like Facebook, Instagram, YouTube, and TikTok to disseminate valuable information

about oral health (Hafizah et al., 2020). Dentists may educate patients about proper oral hygiene, common dental procedures, and preventive care through engaging videos, infographics, and live Q&A session. This is not only empowering patients to take better care of their oral health but also establishes the dentist as a trusted source of information (Unnikrishnan et al., 2018).

Social media platforms offer dentists an opportunity to showcase their expertise and build trust and credibility with their patients. Dentists can demonstrate their professional competence through sharing before and after photos of successful treatments, patient testimonials, and educational content (Gao et al., 2013; Holden, 2017). These online interactions help foster a sense of trust and confidence among potential patients, making them more likely to choose a particular dentist for their oral care needs (Hamasha et al., 2019).

Social media provides a cost-effective avenue for dentists to announce promotions, discounts, and special offers (Parmar et al., 2018). Dentists can create targeted ad campaigns, showcase their specialization, and establish a unique brand identity, enabling them to reach a broader and more diverse patients, encourage existing ones to schedule appointments for treatments or check-ups, and enhance the visibility of the dental practice within the local community (Bahabri et al., 2021). Furthermore, online reviews and feedback play a crucial role in shaping a dentist's reputation. Social media allows dentists to actively monitor and manage their online reputation (Saadeh, 2022).

The more successful the marketing efforts on social media, the higher the potential income for the practice (Ajwa et al., 2018; Gilfoil and Jobs, 2012; Marshall et al., 2012; Shojaee and Azman, 2013; Tsimonis and Dimitriadis, 2014).

5.2. Limitation and future research directions

This study provides valuable insights into the acceptance of social media among dentists; however, several limitations must be acknowledged, which also present opportunities for future research. One primary limitation is the administrative process required for conducting the research, including the need to obtain formal approvals such as the letter of support and the letter of approval from the university. These procedural requirements added a layer of complexity to the research design and extended the time required for data collection, which may have affected the overall research timeline.

Additionally, the limited availability of relevant literature on the adoption of social media by dentists, particularly in the Malaysian context, posed challenges in establishing a comprehensive theoretical foundation. As highlighted in **Table 1**, the number of studies focused specifically on the use of social media by dentists in Malaysia is minimal. This lack of empirical research underlines the need for more studies that address the unique factors influencing social media adoption in the dental profession within the Malaysian healthcare context. Future research could aim to fill this gap by exploring social media adoption in dentistry across different regions of Malaysia and by comparing these findings with other healthcare sectors. This would provide a clearer understanding of the challenges and benefits that are specific to this profession.

Another limitation pertains to the data collection process itself. Although an online questionnaire was distributed to a sample of 300 dentists, only 209 responses were received. While this response rate is reasonable, it may still limit the generalizability of the findings. Additionally, the data collection period spanned three months, which may have introduced temporal biases. Over time, dentists' perceptions and usage of social media could have been influenced by changing trends, technological advancements, or shifts in professional practices, potentially affecting the accuracy of the results. These external factors could introduce variability in how dentists respond to questions related to the perceived ease of use and usefulness of social media, which are core constructs of the Technology Acceptance Model (TAM).

To address these limitations, we recommend that future research integrate qualitative data collection methods, such as in-depth interviews or case studies, to complement the quantitative survey data. Qualitative methods would allow researchers to gain a deeper understanding of the motivations, challenges, and strategies that dentists employ in using social media. Specifically, interviews—whether conducted via telephone or face-to-face—could provide more contextual and rich insights into participants' experiences with social media adoption. These insights would enhance the validity of the study by capturing nuanced details that may not be fully addressed by survey questions alone.

Additionally, integrating qualitative data would help refine and adapt the questionnaire items to better align with the specific needs and challenges faced by dentists. This approach would also address potential misinterpretations during survey responses and ensure that the survey instrument more accurately reflects the real-world context of social media usage in the dental profession.

Expanding the geographical scope of data collection is another key direction for future research. Including dentists from various regions across Malaysia—or even incorporating an international perspective—could provide a broader understanding of the factors influencing social media adoption in different contexts. Comparative studies could help identify regional or cultural differences in social media use, offering more robust insights into the contextual variables shaping dentists' attitudes and behaviors.

Lastly, a longitudinal approach could provide valuable insights into how dentists' attitudes toward social media evolve over time. By following participants over an extended period, researchers would be able to track shifts in perceptions of social media's usefulness and ease of use, and observe the long-term impact of these changes on dentists' practices. Longitudinal studies could also explore how trends in social media and technological innovations influence the behavior of dental professionals, providing a more dynamic view of social media adoption and its impact on professional development.

In conclusion, while this study has made significant contributions to understanding social media adoption among dentists, addressing the limitations identified here and pursuing the suggested future directions will enhance the depth and reliability of future research. By incorporating qualitative methods, broadening the geographical scope, and adopting a longitudinal approach, subsequent studies could provide a more comprehensive and nuanced understanding of the factors that influence social media use in the dental profession.

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References

- Abolchamat, A., Saadeh, R., & Amin, M. (2021). Social media in healthcare: Dentists' use of digital marketing in Malaysia. *International Journal of Medical Marketing*, 15(2), 102-111.
- Adnan, M. A., Ibrahim, A. H., & Latif, M. Z. (2022). Social media's impact on dentist-patient communication: A review of ethical concerns. *Journal of Healthcare Communication*, 18(3), 1-7.
- Aguiar, P., Gonzalez, M. A., & Maluf, R. (2020). The role of social media in dental practice marketing. *Dental Research Journal*, 25(1), 29-34.
- Ahani, A., Rahim, N. Z. A., & Nilashi, M. (2017). Forecasting social CRM adoption in SMEs: A combined SEM-neural network method. *Computers in Human Behavior*, 75, 560-578.
- Ahlskog, M., Bruch, J., & Jackson, M. (2017). Knowledge integration in manufacturing technology development. *Journal of Manufacturing Technology Management*, 28(8), 1035-1054.
- Ahmad, S. Z., Bakar, A. R. A., & Ahmad, N. (2018). Social media adoption and its impact on firm performance: The case of the UAE. *International Journal of Entrepreneurial Behavior & Research*, 1355-2554.
- Ajwa, N., Mohsen, S. A., Kuwail, A., & Osaiif, E. A. (2018). The impact of using social media networks on dental treatment marketing in Saudi Arabia: The practitioners and patient's perspectives. *Journal of Oral Health and Dental Science*, 2(3), 77-85.
- Alsharji, A., Ahmad, S. Z., & Bakar, A. R. A. (2018). Understanding social media adoption in SMEs: Empirical evidence from the United Arab Emirates. *Journal of Entrepreneurship in Emerging Economies*, 10(2), 302-328.
- Althunayan, A., Alsalhi, R., & Elmoazen, R. (2018). Role of social media in dental health promotion and behavior change in Qassim province, Saudi Arabia. *International Journal of Medical and Health Research*, 4(2), 98-103.
- Amin, H. (2016). Investigating drivers of internet giving behavior in Malaysia. *Asia Pacific Journal of Marketing and Logistics*, 28(2), 256-277.
- Amin, M. T., Goh, W. P., & Saad, S. M. (2022). Influences on social media adoption among healthcare professionals in Malaysia. *Journal of Digital Health*, 6(2), 58-66.
- Barreda, A. (2014). Creating brand equity when using travel-related online social network websites. *Journal of Vacation Marketing*, 20(4), 365-379.
- Bhatti, Z., Luthra, S., & Arora, A. (2020). Privacy concerns and social media adoption in healthcare services. *Healthcare Management Review*, 45(4), 57-64.
- Brown, T., & Green, D. (2022). Purposive sampling in healthcare research: A review of applications and best practices. *Journal of Healthcare Research*, 32(4), 390-401.
- Chanthinok, K., Ussahawanitchakit, P., & Jhundra-Indra, P. (2015). Social media marketing strategy and marketing performance: Evidence from e-commerce firms in Thailand. *AU-GSB E-Journal*, 8(1), 1-19.
- Chiasson, M. A., Hirshfield, S., & Rietmeijer, C. (2010). HIV prevention and care in the digital age. *Journal of Acquired Immune Deficiency Syndromes*, 55, 94-97.
- Davis, F. D. (1986). A technology acceptance model for empirically testing new end-user information systems: Theory and results [PhD thesis]. MIT Sloan School of Management, Cambridge, MA.
- Eisingerich, A. B., Chun, H. H., & Liu, Y. (2017). The effect of social media marketing and engagement on customer behavior: The role of digital engagement. *International Journal of Research in Marketing*, 34(4), 931-946.
- Evetts, J. (2021). Professionalism in dentistry: Challenges in the age of social media. *Journal of Dental Ethics*, 36(3), 198-210.
- Feng, Y., Zhang, X., & Li, M. (2023). Social media adoption in healthcare: A systematic review. *Journal of Health Communication*, 28(3), 223-234. <https://doi.org/10.1080/10810730.2023.1878301>
- Fuchs, C. (2017). *Social media: A critical introduction*. Sage Publications.

- Gao, T., & Zhang, L. (2014). The impact of social media on business performance: Evidence from China. *Asian Social Science*, 10(17), 11-19.
- Gensler, S., Völckner, F., Liu-Thompkins, Y., & Wiertz, C. (2013). Managing brands in the social media environment. *Journal of Interactive Marketing*, 27(4), 242-257.
- Goh, K. Y., Heng, C. S., & Lin, Z. (2013). Social media brand community and consumer behavior: Quantifying the relative importance of online word-of-mouth and social media platforms. *Journal of Interactive Marketing*, 27(1), 13-27.
- Goh, W. P., Lee, J., & Kumar, M. (2020). Factors influencing social media adoption in healthcare: A study of Malaysian dentists. *Journal of Healthcare Marketing*, 33(3), 1-9.
- Hafizah, M., Zainol, Z., & Abdul, R. (2020). Social media marketing in dental practices: Adoption and utilization among Malaysian dentists. *Malaysian Journal of Dentistry*, 22(1), 45–52.
- Hamasha, A. A., Alshehri, A., & Alghamdi, M. (2019). Barriers to social media adoption by dental professionals in Malaysia. *Journal of Dental Research and Practice*, 32(5), 123–135.
- Hanafizadeh, P., Saghaei, A., & Zareravasan, A. (2021). The role of social media in enhancing business competitiveness. *Journal of Business Research*, 134, 102–117. <https://doi.org/10.1016/j.jbusres.2021.05.023>.
- Hassan, S., Azmi, N., & Jaafar, M. (2015). Social media marketing strategies and consumer engagement in Malaysia. *Journal of Marketing Studies*, 10(2), 45–58.
- Henderson, K., Martin, C., & Jovic, M. (2022). Social media marketing in dentistry: Perceptions and practices. *Journal of Dental Marketing*, 34(1), 101-110.
- Hennig-Thurau, T., Hofacker, C. F., & Bloching, B. (2013). Marketing the marketing of social media: How to engage customers and build brand loyalty. *Journal of Interactive Marketing*, 27(3), 191-203.
- Hossain, M. S., Khan, A. M., & Al Mamun, A. (2023). Social media engagement and its impact on healthcare professionals: An empirical study. *International Journal of Healthcare Management*, 16(4), 475-484. <https://doi.org/10.1080/20421338.2023.1969358>
- Hussain, A., & Fashola, A. (2019). Investigating social media's influence on consumer buying behavior: A study of young adults in Pakistan. *Journal of Consumer Research*, 19(2), 135-146.
- Ismail, A. R., & Al-Tabbaa, O. (2015). Internet adoption and impact on marketing strategies in small businesses in Malaysia. *International Journal of Emerging Markets*, 10(4), 334-355.
- Jhanji, V., Sharma, S., & Gupta, N. (2021). Social media challenges for dental professionals: Ethical concerns and practical solutions. *Journal of Dental Ethics*, 27(4), 123–135.
- Jiang, C., Li, H., & Zhang, W. (2023). Digital tools in clinical practice: The role of social media in dentistry. *Journal of Medical Internet Research*, 25(1), e21345. <https://doi.org/10.2196/21345>
- Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of social media. *Business Horizons*, 53(1), 59-68.
- Kazley, A. S., Shephard, C., & Kolb, M. (2016). Leveraging social media for patient engagement in dental care. *Journal of Health Communication*, 21(3), 67–78.
- Karimi, M., & Naghibi, M. (2015). Social media marketing: An approach to enhancing customer engagement. *Journal of Business and Marketing*, 15(4), 89–102.
- Keller, K. L. (2009). *Building strong brands*. Pearson Prentice Hall.
- Kim, J., & Kim, M. (2014). The effects of social media on brand loyalty: A case of Samsung. *Journal of Business Research*, 67(10), 2144-2150.
- Kukreti, S., Sharma, P., & Gupta, R. (2024). Digital marketing trends in healthcare: A focus on social media adoption. *Journal of Digital Marketing*, 29(1), 33–48.
- Kumar, S., Gupta, R., & Singh, P. (2021). The impact of social media reviews on dental practice credibility. *International Journal of Dental Marketing*, 19(4), 102–118.
- Kusumawati, A. E., & Suryani, N. (2018). The effect of social media marketing on consumer purchasing decision in the cosmetics industry. *Asia Pacific Journal of Marketing and Logistics*, 30(1), 112-127.
- Lodhi, S., Ahmed, R., & Rehman, N. (2021). Social media and professional boundaries: The dental perspective. *Journal of Medical Ethics and Professionalism*, 15(3), 56–68.
- Leung, L., & Wei, R. (2013). More than just talking: The role of social media in marketing. *Journal of Advertising Research*, 53(2), 181-194.

- Mazar, N., & Zhong, C. B. (2010). Do green products make us better people?. *Psychological Science*, 21(4), 494-498.
- Memon, M. A., Rahman, A., & Anwar, S. (2023). Sample size determination in structural equation modeling (SEM): A review of methodologies. *Journal of Applied Structural Equation Modeling*, 1(1), 45-58. <https://doi.org/10.1016/j.jasem.2023.04.001>
- Miller, R. (2017). *The digital age: Marketing strategies in the 21st century*. McGraw-Hill.
- Munoz-Leiva, F., & Sánchez-Fernández, J. (2015). Marketing innovation in the digital age. *European Journal of Innovation Management*, 18(2), 139-149.
- Nihon, K., Muralidharan, A., & Shaikh, K. (2021). Analyzing social media use among dental professionals. *Journal of Contemporary Dental Practice*, 12(2), 10-17.
- Parmar, N., Dong, L., & Eisingerich, A. B. (2018). Engaging patients through social media in dental care services. *Journal of Dental Research*, 97(3), 233–240.
- Razak, A., Karim, N., & Rahim, M. (2016). Gaining competitive advantage through social media marketing strategies. *Journal of Business and Management*, 22(2), 45–58.
- Shahizan, H., Mohd, R., & Azlina, Z. (2012). The role of social media in Malaysia: A comprehensive review. *Asian Journal of Social Science Research*, 9(4), 233–248.
- Sharma, P., & Bhardwaj, A. (2020). Social media adoption in small businesses: A study of the hospitality sector in India. *Tourism Management*, 34(2), 1-14.
- Sihombing, R. D., & Kristanti, N. (2022). Social media and marketing practices in dental clinics in Indonesia. *Journal of Indonesian Dental Research*, 8(1), 21-30.
- Singh, R., & Mishra, P. (2019). Digital marketing and its impact on consumer behavior in the healthcare sector. *Journal of Digital Marketing*, 7(2), 53-60.
- Tajudeen, F. P., & Sharif, S. M. (2021). A review of the impact of social media on customer loyalty: Evidence from Malaysian small businesses. *Asian Journal of Business and Marketing*, 15(3), 39-47.
- Thomson, M., & Malmberg, M. (2020). Ethical issues in the use of social media in dental marketing. *Dental Ethics Journal*, 13(2), 122-130.
- Valos, M., Habibi, M., & Casidy, R. (2016). Interactive marketing strategies through social media platforms. *Journal of Marketing Insights*, 11(3), 123–140.
- Wang, J., & Luo, J. (2021). The influence of social media on healthcare marketing: A study of dentist’s adoption in China. *Healthcare Marketing Journal*, 29(1), 45-53.
- Wong, L. L., & Mathews, C. (2019). Healthcare marketing through social media: A study of patient engagement. *Journal of Healthcare Marketing*, 16(4), 223-234.
- Yousuf, R., Ghani, H., & Latif, A. (2017). Barriers to adopting social media in dental practices: Evidence from Malaysia. *Journal of Health Communication*, 22(2), 98–112.
- Zhang, Y., & Lee, J. (2020). Social media marketing in dentistry: Impacts on patients’ perceptions and behavior. *Journal of Dental Research*, 45(3), 167-173.