

ORIGINAL RESEARCH

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# Association between knowledge and attitudes toward dental marketing among practicing dentists in Peru: A cross-sectional study.

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**Received:** April 15, 2026

**Revised:** April 18, 2026

**Accepted:** April 28, 2026

## Academic Editor

Yovana Gutierrez, MSc

## Abstract

In recent years, the integration of marketing strategies into dental practice has become essential for improving professional competitiveness, patient acquisition, and service sustainability. However, evidence on dentists' knowledge and attitudes toward dental marketing remains limited, particularly in developing countries. This study aimed to assess the association between knowledge and attitudes toward dental marketing among practicing dentists in Peru. A quantitative, observational, cross-sectional, and analytical study was conducted, including 139 dentists selected from a population of 215 professionals in Trujillo. Data were collected using a validated questionnaire developed by Calderón T, designed to evaluate knowledge and attitudes related to dental marketing. Statistical analysis was performed using the chi-square test. The results demonstrated a statistically significant association between knowledge level and attitudes toward dental marketing ( $p < 0.001$ ). Regarding knowledge, a regular level was more frequent among males (30.2%), whereas a poor level predominated among females (25.2%); by age, dentists aged  $\geq 46$  years showed mainly regular knowledge (21.6%). Concerning attitudes, poor attitudes were observed in both males (25.2%) and females (25.9%), with the highest frequency in the 36–45-year age group (23.7%). These findings indicate that insufficient knowledge is associated with unfavorable attitudes toward dental marketing. In conclusion, a significant association exists between knowledge and attitudes, highlighting the need to strengthen training in marketing competencies among dental professionals.

**Keywords:** Knowledge, Attitude, Dentists, Marketing, Health Knowledge.

## Introduction

Contemporary dental practice is increasingly shaped by competition, digital communication, and patient-centered service models. In this context, marketing is no longer limited to advertising; rather, it encompasses strategic communication, professional visibility, relationship building, and service positioning. This evolution has also reached dental education, where management, entrepreneurship, leadership, and marketing have begun to receive formal curricular attention. At the same time, the growing use of social media in dentistry has created new opportunities for professional communication, while also generating tensions between promotion, education, and professionalism. [1–3]

The available literature shows that dentists and patients increasingly interact through digital platforms, and that social media can influence how professionals are perceived and how practices attract new patients. Prior studies have shown that both patients and dentists recognize the relevance of social media in dental settings, while surveys of practitioners and practices have documented its use for communication, promotion, and organizational visibility. Research in orthodontics and dental organizations further suggests that online engagement can contribute to market positioning and strengthen patient–provider contact. [4–8]

Despite this growing relevance, the development of marketing-related competencies in dentistry remains uneven. The educational literature indicates that social media and digital communication tools have become increasingly present in dental training; however, their incorporation has also raised concerns regarding professionalism, ethics, and legal boundaries. Studies conducted among dental students and practitioners suggest that online behavior, professional self-presentation, and attitudes toward social media are important but inconsistently developed domains, which may influence how future dentists understand and use marketing-related strategies. [9–12]

In addition to visibility, the type and quality of online content appear to matter. Studies on patient testimonials, social media images, and practice-related digital content indicate that online materials may shape perceived professional credibility, willingness to become a client, and decisions to change dental provider. Thus, dental marketing should be understood not only as promotion, but also as a form of professional communication capable of influencing trust, expectations, and patient choice. [13–15]

The objective of this study was to evaluate the association between knowledge and attitudes toward dental marketing among practicing dentists in Peru. This study is justified because understanding that relationship may help clarify whether insufficient knowledge is accompanied by less favorable professional attitudes toward marketing, which has direct implications for undergraduate education, continuing professional training, and evidence-informed dental practice.

## Methods

### *Study Design and reporting guideline*

This observational cross-sectional study was conducted in practicing dentists from Trujillo, Peru, in 2023, following the recommendations of the STROBE statement for reporting observational studies.

### *Participants*

The target population comprised 215 dentists registered in the district of Trujillo, province of Trujillo, La Libertad, according to records provided by the Regional Council of the Peruvian College of Dentists. Eligible participants were dentists working in either public or private practice, with active professional licensure, who voluntarily agreed to participate by signing informed consent. Dentists with physical or mental conditions that could prevent completion of the questionnaire were excluded.

The sample consisted of 139 dentists. Sample size was calculated for a finite population using a 95% confidence level, 5% margin of error, and an expected proportion of 50%, resulting in a minimum required sample of 139 participants. A non-probability convenience sampling method was used.

### Procedures

For data collection, authorization was first requested from the corresponding academic authorities and from the professional dental association. Dentists were approached in their workplaces, and after providing informed consent, they completed the questionnaire in approximately 30 to 35 minutes. The researcher remained available to clarify any questions during administration. Data were subsequently entered into Microsoft Excel and analyzed using IBM SPSS Statistics version 25.0.

### Measurement instruments, validity, and reliability

Data were collected using a questionnaire developed by Calderón (2022), which included two sections: sociodemographic information and items assessing knowledge and attitudes toward dental marketing.

Knowledge was evaluated with five multiple-choice items, each with one correct answer, and

addition, sex, age, and years of professional practice were considered as covariates.

According to the original validation study, internal consistency was acceptable, with a Cronbach's alpha of 0.797 for the knowledge section and 0.806 for the attitudes section.

### Statistical Analysis

Descriptive statistics included absolute and relative frequencies. The association between knowledge level and attitudes toward dental marketing was evaluated using the chi-square test, with statistical significance set at  $p < 0.05$ .

### Ethical Considerations

The study was conducted in accordance with the principles of the World Medical Association Declaration of Helsinki and was approved by the institutional ethics committee of the corresponding academic institution.

### Results

A statistically significant association was observed between knowledge level and attitudes toward dental marketing among practicing dentists ( $\chi^2 = 22.943$ ,  $p < 0.001$ ), with higher proportions of moderate and poor attitudes found among those with lower knowledge levels (Table 1).

**Table 1.** Association between knowledge level and attitudes toward dental marketing among practicing dentists in Peru.

knowledge level	Attitudes						Total	X <sup>2</sup>	p	
	Good		Moderate		Poor					
	f	%	f	%	f	%				
Good	0	0,0	1	0,7	4	2,9	5	3,6	22,943	0,000
Moderate	3	2,2	37	26,6	35	25,2	75	54,0		
Poor	1	0,7	26	18,7	32	23,0	59	42,4		
Total	4	2,9	64	46,0	71	51,1	139	100,0		

categorized as good, moderate, or poor. Attitudes were assessed with five Likert-type items and categorized as favorable, neutral, or unfavorable. In

Overall, poor knowledge was the most frequent category (42.4%, n=59), followed by moderate (54.0%, n=75) and good knowledge (3.6%, n=5).

Regarding sociodemographic characteristics, moderate knowledge levels were more prevalent among both male (30.2%, n=42) and female dentists (23.7%, n=33), while poor knowledge was slightly higher among females (25.2%, n=35) compared to males (17.3%, n=24). In terms of age, dentists aged ≥46 years showed a relatively higher proportion of moderate knowledge (21.6%, n=30), whereas poor knowledge was more frequent among those aged 25–35 years (16.5%, n=23) (Table 2).

Similarly, attitudes toward dental marketing varied across sociodemographic groups, with poor attitudes being more frequent among females (25.9%, n=36) compared to males (25.2%, n=35). Across age groups, poor attitudes were more prevalent among dentists aged 25–35 years (16.5%, n=23) and 36–45 years (23.7%, n=33), while

moderate attitudes predominated in most groups. Regarding years of professional practice, dentists with ≥11 years showed a higher proportion of poor attitudes (21.6%, n=30), whereas moderate attitudes were more common among those with 6–10 years of experience (22.3%, n=31) (Table 3).

### Discussion

The present study found a significant association between knowledge and attitudes toward dental marketing among practicing dentists. Although the studies by Anshasi et al. [16] and Holden et al. [17] did not assess exactly the same variables, they provide a useful interpretive framework for these findings. Anshasi et al. described an increasingly favorable view of advertising and practice promotion among Jordanian dentists, whereas

**Table 2.** Distribution of knowledge level toward dental marketing according to sociodemographic characteristics.

Variable	Category	Good n (%)	Moderate n (%)	Poor n (%)	Total n (%)
Sex	Male	2 (1.4)	42 (30.2)	24 (17.3)	68 (48.9)
	Female	3 (2.2)	33 (23.7)	35 (25.2)	71 (51.1)
Age (years)	25–35	1 (0.7)	18 (12.9)	23 (16.5)	42 (30.2)
	36–45	4 (2.9)	27 (19.4)	23 (16.5)	54 (38.8)
	≥46	0 (0.0)	30 (21.6)	13 (9.4)	43 (30.9)
Years of professional practice	0–5	1 (0.7)	11 (7.9)	17 (12.3)	29 (20.9)
	6–10	2 (1.4)	33 (23.7)	24 (17.3)	59 (42.4)
	≥11	2 (1.4)	31 (22.3)	18 (13.0)	51 (36.7)

**Table 3.** Distribution of attitudes toward dental marketing according to sociodemographic characteristics.

Variable	Category	Good n (%)	Moderate n (%)	Poor n (%)	Total n (%)
Sex	Male	3 (2.2)	30 (21.5)	35 (25.2)	68 (48.9)
	Female	1 (0.7)	34 (24.5)	36 (25.9)	71 (51.1)
Age (years)	25–35	3 (2.1)	23 (16.5)	16 (11.4)	42 (30.2)
	36–45	0 (0.0)	21 (15.2)	33 (23.7)	54 (38.8)
	≥46	1 (0.7)	20 (14.4)	22 (15.8)	43 (30.9)
Years of professional practice	0–5	0 (0.0)	13 (9.4)	16 (11.5)	29 (20.9)
	6–10	3 (2.2)	31 (22.3)	25 (18.0)	59 (42.4)
	≥11	1 (0.7)	20 (14.4)	30 (21.6)	51 (36.7)

Holden et al. showed that dentists in private practice often navigate a tension between professional obligations and commercial realities. Taken together, these reports suggest that attitudes toward marketing are not purely spontaneous; rather, they are shaped by how dentists understand its purpose, boundaries, and legitimacy within professional practice.

From a professional standpoint, the findings also gain relevance when considered in light of recent evidence on online presence and patient choice. Pollet and Diakonoff [18] reported regulatory shortcomings in the websites of French dental practices, while Gušić et al. [19] found that social media presence can influence dentist selection in the general population, with age and education acting as significant predictors. These studies suggest that deficient knowledge in marketing may have consequences that extend beyond promotion itself, affecting how dentists present their services, comply with communication standards, and position themselves in increasingly digital care environments.

The practical relevance of attitudes toward dental marketing is further supported by studies on online reputation and patient experience. Vafeiadis [20] found that responding to online dental reviews can improve consumer reactions toward a practice, while Lin et al. [21] showed that patient online reviews capture relevant dimensions of dental care experience and perceived quality. Likewise, Kroon and Park [22] demonstrated that negative online reviews of dental services often focus on communication and service-related issues. In this context, less favorable attitudes toward marketing may limit dentists' willingness to engage constructively with digital feedback, patient communication, and reputation management.

The scientific implications of these findings should also be considered within the broader process of dental digitalization. Neville and van der Zande [22] argued that digital technologies are reshaping practice management and dentist-patient communication, making digital competencies increasingly relevant to contemporary dentistry. Under this perspective, marketing knowledge

should not be seen as an external or purely commercial skill, but as part of a wider set of professional competencies needed to communicate effectively, responsibly, and competitively in modern oral health care.

This study has important strengths, including the simultaneous evaluation of knowledge and attitudes within the same professional population and the use of an analytical approach to examine their association. However, some limitations should be acknowledged. The cross-sectional design does not permit causal inference, the use of self-reported measures may have introduced response bias, and the study was conducted in a single Peruvian city, which limits generalizability. Future studies should incorporate multicenter samples, evaluate additional explanatory variables such as prior training in communication or digital marketing, and explore whether educational interventions can improve both knowledge and attitudes in this field.

## Conclusions

The present study demonstrated a statistically significant association between knowledge level and attitudes toward dental marketing among practicing dentists. Most participants showed moderate to poor levels in both variables, indicating limited development of marketing-related competencies. Additionally, variations were observed according to sociodemographic characteristics, particularly age and years of professional practice.

## Author Contributions Statement (CRediT)

**BMFM:** Conceptualization, Methodology, Writing – Original Draft, Supervision, Formal analysis, Data curation, Validation, Visualization.

**SYO:** Resources, Project administration, Funding acquisition, Writing – Review & Editing.

## Acknowledgments and Funding

The authors express their appreciation to all participants for their collaboration and willingness

to contribute to this study. We also acknowledge the academic and administrative staff who facilitated the data collection process and provided logistical support during the development of the research.

This study did not receive any specific funding from public, commercial, or non-profit organizations. All stages of the research were carried out with the authors' own resources.

## Conflict of Interest

The authors declare that there are no competing interests of any kind, whether financial, institutional, or personal, that could have influenced the design, execution, or reporting of this study.

## Data Availability

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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