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Original Article

Enhancing patient-centred care in Taiwan's dental education system: Exploring the feasibility of doctor-patient communication education and training

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Abstract *Background/purpose:* Improved communication can optimize treatment outcomes and patient satisfaction. Findings emphasize the need for tailored communication strategies based on patient characteristics. Implementing communication courses can enhance patient-centered care and reduce conflicts. Therefore, this study examined the feasibility of integrating doctor-patient communication education in Taiwan's dental education system.
Materials and methods: Using interviews and questionnaires, we conducted descriptive statistics and generalized linear mixed-effects model analysis on the importance of doctor-patient communication from the dentist and patient perspectives.
Results: More than 600 patient surveys and four interviewed dentists with 20+ years of experience stressed doctor-patient communication in dentistry. Patients' age and income were positively related to the emphasis on physician-patient communication but negatively associated with dental assistants' communication. Dentists valued communication education but differed in its execution and importance.
Conclusion: It is recommended to initiate dentist-patient communication education during university studies and continue its practice to adapt to the changing societal dynamics. Individuals with higher socioeconomic status and older age show a greater appreciation for dentist-patient communication, potentially driven by self-promotion, thereby highlighting the diverse nature of doctor-patient relationships. Based on our findings, we suggest to implement the doctor-patient communication courses in Taiwan.

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Introduction

Communication skills are fundamental to successful medical practice and can greatly impact patient satisfaction, adherence and outcomes.[1] These include skills such as empathy and listening skills. There are studies showing different ways of expressing empathy and their positive impact on patient outcomes and doctor-patient communication.[2]

Effective doctor-patient communication helps to build a trusting relationship between doctors and patients. When patients feel understood, respected and cared for, they are more likely to trust their doctors and follow medical advice.[3] The rise of artificial intelligence in recent years has brought about major changes in the communication between doctors and patients. Although Artificial Intelligence (AI) can provide convenience and enhance medical capabilities, in terms of sensitive medical issues and humane care, the interaction between people still remains is irreplaceable.[4]

In recent years, school courses, such as clinical practice courses,[5] have been affected by the pandemic of COVID-19.[6] Clinical practice courses are a vital part of the dental department curriculum.[7] Online courses are hard to replace in replicating patient and doctor interactions.[8,9]

In various countries, in addition to the internship, many courses are related to interactions between patients and doctors.[10] For example, Japan Dental University offers a course titled "Doctor-Patient Relationship".[11] That teaches practical communication skills to students through hands-on interaction with patients,[12] whereas such courses are not included in dental education in Taiwan. There is another course called Medical Ethics in Taiwan. However, it focuses on medical disputes and cases, with little reference to doctor-patient communication,[13] and seldom discussion of the patient's physical and mental condition, the socio-economic status of medical treatment, and the impact of communication.[13] In today's Taiwan, fierce conflicts often occur between doctors and patients due to poor medical communication, leading to medical disputes and, in severe cases, even lawsuits. Such courses are thus essential.[14]

Clear communication is also beneficial in designing effective treatment plans that expected outcomes throughout the treatment process. Communication methods may vary depending on the patient's age and medical history.[15] For elderly patients, dentists may need to spend more time explaining medical techniques and considering existing chronic conditions.[16] Communication with children should be simplified, and emotional support should be given.[17] Sometimes, communication with family members may be necessary.[18] Adolescent or adult patients may have differing opinions and preferences regarding treatment plans,[19] necessitating extensive discussions with their dentists. Additionally, these patients tend to prioritize their appearance and image,[20] and dentists should tailor treatment plans accordingly.

In summary, effective doctor-patient communication is essential in dental care to avoid disputes over treatment costs and time issues. Patients can make informed decisions and receive optimal dental care through effective communication. Through interviews with dentists, this study explored whether Taiwan universities should offer doctor-patient communication courses to their dental students.

Materials and methods

In this study, a mixed methods research approach was adopted, combining qualitative and quantitative research methods to obtain more comprehensive and in-depth research results. By simultaneously collecting opinions from doctors and patients, this study aimed to elucidate the differences in doctor-patient communication between the two perspectives.

To obtain doctors' opinions, qualitative research was conducted through interviews. Due to the limited number of interviews, the data obtained from doctors were qualitative in nature, allowing for an exploration of the underlying reasons behind their viewpoints. On the other hand, quantitative research was conducted using online questionnaires to gather patients' thoughts and ideas, providing a better understanding of their perspectives.

Semi-structured interviews were conducted as the primary research method to explore the current and future development of doctor-patient communication in dental courses in Taiwan. Four dentistry professors were interviewed using an interview outline developed based on previous studies.[21]

Prior to the interviews, consent was obtained from the experts and scholars who were selected as interviewees. The confidentiality of the interviewees' data was strictly maintained. A preliminary conversation was initiated before the face-to-face interviews to establish trust between the interviewer and interviewee. During this conversation, the research background and purpose were introduced. The interview questions were based on a standardized outline, incorporating open-ended questions to elicit valuable information from the interviewees. Follow-up questions and guidance were provided to delve deeper into the topics of discussion. The interviews lasted between 30 min and 1 h, and the interviewees were allowed to interrupt the interview if needed.

The interviews were recorded using audio recordings and notes, and the interviewees had given consent for the use of these recordings and notes. The accuracy of the interview content was ensured to maintain research rigor.

For the patient survey, questionnaires were distributed online. The survey was conducted from March 29 to April 30, 2023, and a total of 618 valid questionnaires were collected. The questionnaire was administered and collected in the form of an online questionnaire. Sample sources were collected from high school, college, and college alumni. The age groups sampled ranged from high school students to the elderly. To increase sampling diversity, we also used Facebook and LINE groups as a means of distributing the questionnaire. While online questionnaires allow for quick and comprehensive data collection, it is acknowledged that some respondents may have provided careless or inaccurate responses, which is a limitation of this study.

The questionnaire focused on two aspects. The first aspect examined whether patients have good communication with medical staff, which can influence their choice of

Table 1 The proportion of the basic structure of the patient questionnaire (gender, education, income, age and structure of medical practitioners).

Items	Option	Proportion
Gender	Male	33.60%
	Female	66.40%
Education	High school diploma	18.20%
	Bachelor's degree	50.00%
	Master's degree	28.00%
	Doctor's degree	3.80%
Income (Taiwan $)	<200 K	53.60%
	200–500 K	10.00%
	500–1000 K	18.00%
	1000–1500 K	11.00%
	1500–2000 K	3.30%
	>2000 K	4.20%
Age (yrs old)	<20	29.80%
	21–30	31.60%
	31–40	5.90%
	41–50	16.50%
	51–60	13.40%
	>60	2.80%
Medical personnel	Medical personnel	3.50%
	Non-medical personnel	96.50%

healthcare providers. The second aspect investigated at which stage medical professionals should receive training in doctor-patient communication. The questionnaire included factors measured on a five-point Likert scale, ranging from strongly agree to strongly disagree. The study also explored the association between doctor-patient communication responses and patient demographic factors, such as sex, age, and income. A generalized linear mixed-effects model (GLMM) was employed to test these relationships, with the doctor's medical skills considered as a random effect. The GLMM is a regression model detection method utilized to determine the presence of a significant linear relationship between predictors and the response variable. GLMM accommodates various types of predictors, such as continuous, count-based, and categorical data, making it well-suited for analyzing complex questionnaires with diverse types of answers. The GLMM analysis was conducted using the R packages lme4[22] and lmerTest.[23] To visualize and compare the results in terms of the interdependence between communication responses and patient choice of healthcare providers, a heatmap was generated using the R package pheatmap.[24]

Results

Patient expectations of medical communication

Among the objects of the questionnaire survey, the male to female ratio in this questionnaire was 33.6% male and 66.4% female. Education is mostly bachelor's degree. Most of the income falls below 200,000 yuan, and the age group is mainly between 20 and 30 years old, followed by those under 20 years old. and most of the samples were non-medical practitioners (Table 1).

The results of the questionnaire survey showed that 66.7% of patients highly valued the doctor's medical skills when selecting a dentist, and an additional 30.5% of respondents also considered medical skills in their decision. However, apart from medical skills, patients also considered the dentist's communication abilities as a factor influencing their choice, with 45.4% strongly agreeing and 49.3% agreeing. In terms of communication with dental assistants, the influence of their communication skills was slightly diminished, with 23.0% strongly agreeing and 42.2% agreeing. The questionnaire also sought to understand the preferences of patients' family members when assisting in the selection of a dentist. Among them, 28.1% strongly considered and 48.3% considered doctor-patient communication when choosing a dentist (Table 2).

To gain a better understanding of the questionnaire structure, the data underwent GLMM analysis, with the

Table 2 Questionnaire questions on patients' expectations of doctor-patient communication and course start time.

	Strongly agree	Agree	General	Disagree	Strongly disagree
1. Do you think the dentist's medical technology affects your choice of dentist?	66.7%	30.5%	2.3%	0.0%	0.5%
2. On the premise of not considering the medical technology, the doctor-patient communication skills of the dentist will affect your choice of the dentist?	45.4%	49.3%	4.6%	0.0%	0.7%
3. How does the communication between the dentist and the patient's family affect your choice of dentist?	28.1%	48.3%	19.9%	3.7%	0.0%
4. Does the communication between the dental assistant and you (the patient) affect your choice of dentist without considering medical technology?	23.0%	42.2%	29.4%	4.4%	1.0%
5. At what stage do you think dentists should take courses related to "medical-patient communication" (multiple answers available)?	University stage	Internship stage	Career stage		
	43.5%	23.3%	33.3%		

The first four questions use a five-point Like-style scale, ranging from strongly agree to strongly disagree. The fifth question is divided into three options, the university stage, the internship stage, and the career stage, and the options can be multiple-answered.

Table 3 Relationship between the questionnaire answers and the patients' age and income estimated by the generalized linear mixed-effects model (GLMM).

Response	Fixed effect	Estimate	Std. error	df	*t*	*P*
Communication with dentists	age	0.0043	0.0019	600.9	2.320	0.021*
Communication with assistants	age	−0.0041	0.0026	601.6	−1.565	0.118
Communication with dentists	income	0.0009	0.0005	592.9	1.773	0.077†
Communication with assistants	income	−0.0016	0.0007	593.4	−2.318	0.021*

*$P < 0.05$; †$P < 0.10$.
Only the significant and marginal significant results were shown.

doctor's medical expertise treated as a random effect, and factors such as sex, age, and income were analyzed for their impact on patients' choice of doctors or medical staff. The results indicated that as individuals aged, they placed increasing emphasis on effective communication with doctors ($t = 2.320$, $P = 0.021$) (Table 3). Conversely, there was a trend that older individuals attributed less importance to the communication skills of dental assistants, although the trend was not statistically significant ($t = -1.565$, $P = 0.118$) (Table 3). A marginal positive correlation was found between income and doctor-patient communication ($t = 1.773$, $P = 0.077$) (Table 3). In contrast, income was negatively correlated with the importance attributed to dental assistants' communication skills ($t = -2.318$, $P = 0.021$) (Table 3).

Furthermore, the structure of each topic was analyzed to understand the relationship between each option. As depicted in Fig. 1a, patients expressed their expectations for doctors to enhance their communication skills and promote better doctor-patient communication. Conversely, doctors could improve their medical expertise through college education, internships, and career advancement (Fig. 1b). Additionally, doctors could enhance their communication skills by participating in communication courses at different stages of their careers (Fig. 1c). Recognizing the significance of involving dental assistants in the communication process, efforts were made to improve overall communication effectiveness (Fig. 1d).

Physicians' expectations of medical communication

We conducted interviews with four doctors to gather their perspectives on doctor-patient communication and the necessity of communication courses. The interviewed doctors specialized in Pediatric Dentistry, Periodontics, Disabled Dentistry, and General Dentistry, and had over 20 years of experience in their respective fields. The patients they dealt with ranged from individuals under 12 years old to those over 65 (Table 4).

In dealing with patients of different age groups, doctors employed various communication strategies. When interacting with young or elderly patients, doctors would communicate directly with family members or utilize metaphors and analogies to effectively convey medical information. It was crucial to identify the stage at which doctors recognized the importance of good doctor-patient communication (Table 5). Based on our interviews, most doctors acknowledged the significance of effective communication through their practical experiences and interactions in the workplace. They recognized that developing excellent communication skills required guidance from senior or fellow doctors and could also be acquired through participation in university clubs or direct interaction with patients (Table 5).

Doctors often required assistance in communicating with patients, especially in cases where patients may have difficulty understanding medical plans or procedures, such as young children. However, doctors and patients are distinct individuals, and doctors may sometimes find it challenging to empathize with patients. Additionally, there may be cognitive conflicts between doctors and patients due to differences in their status and medical knowledge. Some patients may also seek medical opinions to validate their predetermined treatment plan, which can further complicate doctor-patient communication (Table 5).

In general, doctors held a positive attitude towards incorporating medical-patient communication courses in universities. However, there were differing opinions on the optimal teaching methodologies. Some physicians advocated for formal courses that supplemented practical course experience to enhance the learning effect. Others suggested using workshops to achieve specific goals, while some believed that all communication and learning between doctors and patients should be acquired through real-world patient interaction in the workplace (Table 5).

Regarding the course content, doctors believed it was necessary to address patients' psychological states and socioeconomic backgrounds. Communication-related courses should focus on integrating theory and practice to ensure an effective learning experience.

Discussion

Based on this study, it was evident that most Taiwanese patients not only considered the medical proficiency of their doctor but also prioritized effective communication between themselves and their healthcare provider when seeking medical treatment. This contrasted with the earlier societal norms in Taiwan, where doctors were regarded with high esteem and were not to be challenged,[25] which was even reflected in the early ethos of gift-giving. The shift in patient attitudes could be attributed to the widespread availability of health and medical information on the internet,[26] which allowed patients to better understand and become more involved in the medical decision-making process.[27–29] As a result, doctor-patient communication

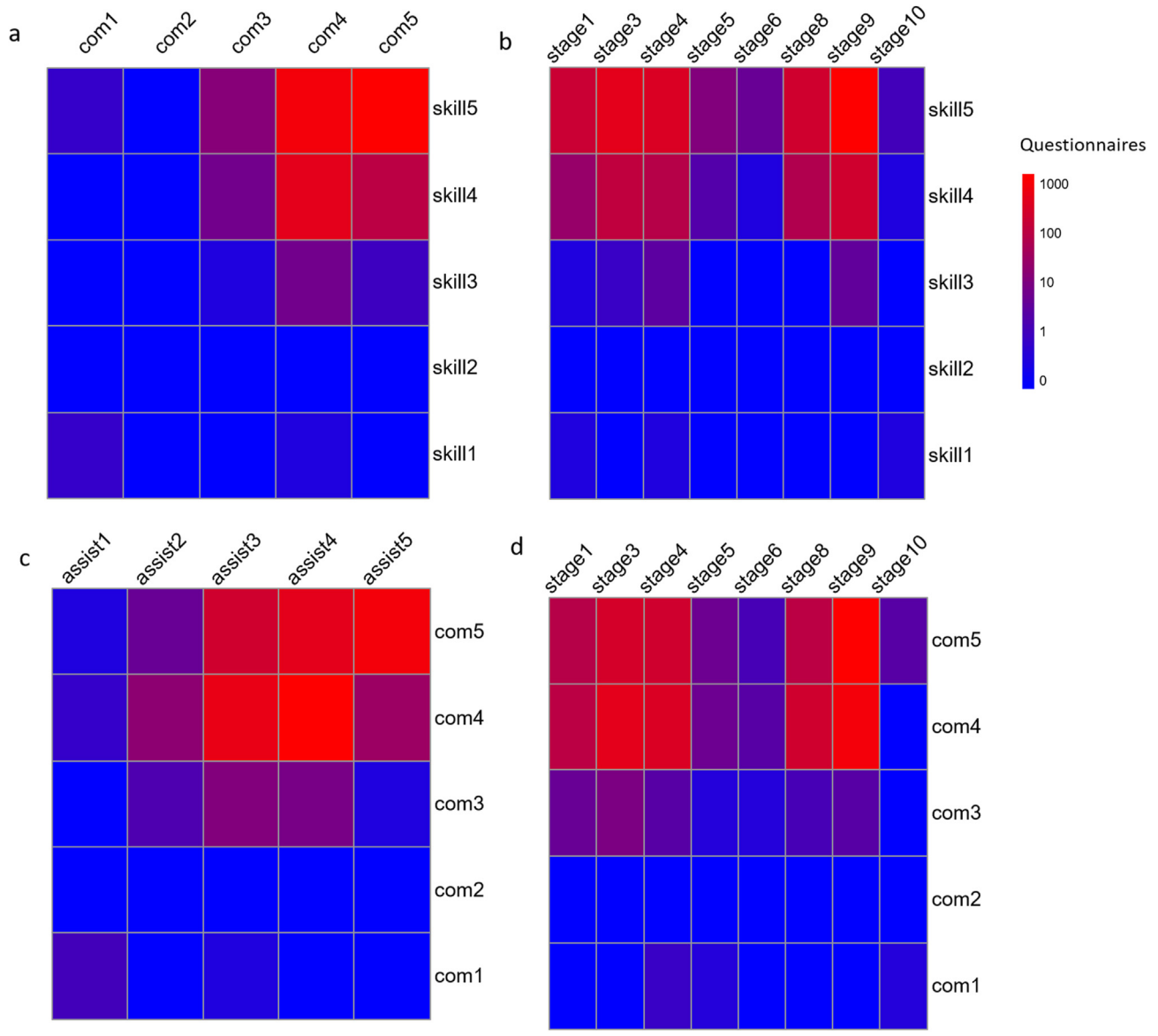

Fig. 1 Relationship of answers in patient questionnaires to each other. a. between answers of Q2 (doctor-patient communication, referred to as "com") and Q1 (Doctor's medical skill, referred to as "skill"), b. between answers of Q5 (training stage, referred to as "stage") and Q1 ("skill"), c. between Q4 (dental assistant-patient communication, referred to as "assist") and Q2 ("com"), d. between Q5 ("stage") and Q2 ("com"). The questionnaire adopts a five-point scale. In Q5, the "stage" denotes when the patients expect dentists to learn doctor-patient communication, where "stage1" is the study stage at college, "stage3" is the intern stage, and "stage5" is the stage of work. This answer is multiple-answer choice, so stages 4, 6, 8, 9 represent the sum of stages1, 3, and 5. For example, "stage4" is stage1 + stage3. The meaning of stage 10 is that the dentist does not need to learn doctor-patient communication at all stages. The color represents the number of responses of the questionnaires.

Table 4 Basic information of interviewed dentists.

Doctor code	Actual age	Occupational experience	Department	Patient age group
D1	57	30 yrs	Pediatric Dentistry	<12 yrs old
D2	50	24 yrs	Periodontics	>12 yrs old
D3	47	23 yrs	Disabled Dentistry	<12 yrs old and >65 yrs old
D4	50	20 yrs	General Dentistry	12–65 yrs old

had transitioned from one-way information sharing to a two-way dialogue, making the doctor's communication skills a crucial factor alongside medical expertise in attracting patients seeking medical treatment.

The study also indicated a positive correlation between age and income and the level of importance placed on doctor-patient communication. Older patients, who had experienced long periods of a "doctor knows best" culture, had a stronger desire for effective communication with their doctors but were relatively less concerned with communication with dental assistants. This phenomenon suggested that elderly patients were more eager to

Table 5 Summary of interview questions and the answers from dentists.

	Dentist 1	Dentist 2	Dentist 3	Dentist 4
1. How do older or younger patients communicate effectively?	1. Ask the parents 2. Metaphor or analogy	Patient understandable language	1. Ask family members 2. Foreign caregivers	1. Ask family members
2. At which stage did you realize the importance of good doctor-patient communication in college, internship, workplace, and self-study?	1. Internship 2. Traineeship	1. Internship 2. Workplace	1. Workplace 2. Self-learning	1. Workplace 2. Self-learning
3. From which teacher or scholar did you learn to establish good communication skills between doctors and patients?	1. Senior physician	1. Refresher courses in the hospital 2. University 3. Internship time 4. Self-learning in the workplace	1. Internship 2. Self-learning	1. Workplace 2. Peer support
4. What difficulties do you find when communicating with doctors and patients?	1. Children need help to understand the treatment process 2. Metaphor or analogy 3. Do a rehearse	1. No way to empathize fully 2. Inequality between doctors and patients	Purposeful	No way to empathize fully
5. Do you think it is necessary to start college courses to facilitate good communication between doctors and patients?	1. It is necessary to establish a curriculum 2. Practical experience and then class	1. It is necessary to hold courses but in the form of non-formal courses	Unnecessary	More and more need
6. What content should be included in this course in university?	Mental state and socio-economic background	Share decision-making courses or workshops	Naturally, in the workplace	1. Combination of theory and practice 2. Communication

understand their doctor's treatment plans and wanted their doctors to understand their pain,[30,31] but still tended to trust dentists with higher levels of medical expertise over dental assistants. This selective option for doctor-patient communication emphasized the need for doctors to spend more time and effort communicating with elderly patients. A similar trend was also observed in patients with higher incomes. These patients required more communication but were only interested in receiving advice from doctors, not dental assistants. This indicated that higher-income patients were more eager for highly professional medical communication,[32] perhaps to demonstrate their social status or may be related to their admiration for medical professionalism.

Based on interviews with four doctors, it was widely agreed that good communication skills were essential in building trust and rapport with patients, which could lead to better treatment outcomes. While classes could help, experience was crucial in developing communication skills, and continuous learning was necessary for improvement over time. Senior physicians and colleagues could provide guidance and support, and learning opportunities were available in university clubs or through direct interaction with patients. Communication courses were suggested to be integrated into the university curriculum, covering relevant topics such as understanding the patient's psychological state and socioeconomic background and developing communication skills applicable to various medical situations. A combination of formal classes, hands-on experience, seminars, and workplace learning was suggested. However, regardless of teaching methods, physicians concurred that the courses must combine theory and practice for optimal learning, enabling future dentists to build trust and rapport with patients and provide quality care.

However, doctors and patients were inherently different, which could create cognitive conflict and communication difficulties. Patients might have come to doctors with preconceived notions or expectations that made it challenging to provide the necessary care.[33] Effective communication and empathy were critical to overcoming these challenges and providing the best possible care for patients. There might have been differences in the perceived importance and emphasis of communication between doctors and patients. Patients

might have expected more personalized and empathetic communication from doctors,[33] while doctors might have prioritized a one-way communication approach to emphasize their professionalism.[34] To reconcile these differences, doctors should have recognized the importance of patient-centred communication and strived to understand their patients' perspectives and preferences.[33,35] Patients should have been encouraged to express their needs and preferences, and doctors should have provided clear and accurate information. It might have been helpful to involve a mediator or a patient advocate to facilitate communication and reach a mutually acceptable solution.[36]

In Taiwan's dental department courses, there was a course called "Medical Ethics", which focused on establishing ethical concepts and principles related to prevention, medical and health behaviors, medical research, and health management systems. This discipline summarized basic ethical principles or guidelines and formed an ethical analysis framework to guide corresponding moral practices, as well as studied specific ethical issues. Tokyo Medical and Dental University offered two courses - "Medical Interview" and "Patients and Medical Personnel" - which concentrated on communication skills between doctors and patients, patient-centred doctor-patient relationships, and used a textbook called "PMI Periodontal Motivational Interviewing"[37] to facilitate smoother communication between doctors and patients.

For doctor-patient communication, patients were encouraged to strengthen their understanding of medical plans or technologies. For example, they could have taken more health education related to dental care and searched for correct medical knowledge online. Patients should have actively participated in the healthcare process by asking questions, seeking clarification, and expressing their concerns. Being open and honest with the doctor was essential, providing all relevant information to aid in diagnosis and treatment decisions.

Among them, oral health education was one of the most important solutions aimed at improving patients' awareness and understanding of oral health. Through oral health education, patients were provided with correct oral hygiene guidance, such as brushing and flossing techniques, to help them effectively clean their mouths and prevent dental and periodontal diseases. Additionally, dietary guidance was given to encourage patients to reduce their consumption of sugary drinks and foods, while increasing their intake of nutrient-rich foods to promote oral health. Furthermore, oral health education included teaching patients about oral disease prevention, stressing the importance of regular oral exams, dental cleanings, and early detection of problems. By providing oral health education, patients were empowered to overcome poor oral habits and developed a stronger awareness of the link between oral health and overall well-being. These educational measures facilitated effective communication between patients and dentists, encouraging the adoption of preventive measures to maintain optimal oral health.

In an era of globalization, an increasing number of immigrants were involved in cross-border migration, leading to greater diversity in ethnicities and languages. This diversity posed new challenges in doctor-patient relationships and the need to assist newcomers in acquiring communication skills related to healthcare. Both doctors and patients should have addressed these issues when dealing with new residents.

Effective doctor-patient communication played a crucial role in enhancing patient satisfaction and treatment outcomes in dental care. Dentists could have built trust and alleviated patient anxiety by actively listening to their concerns, addressing fears, and explaining treatment options and expectations clearly. Additionally, dentists with proper training and experience could have performed procedures more precisely, reducing the risk of complications and improving the overall quality of care. By combining technical proficiency with effective communication, dentists could have delivered optimal care, promoting their patients' overall health and well-being.

In Taiwan's social norms, dentists were highly respected and could not be challenged. However, in modern society, with the advancement of technology and the growing concept of patient-centeredness, for example, shared medical decision-making meant that patients' autonomy was greatly improved. Dentists received highly professional training in medical schools, and their medical concepts and medical and health knowledge were still richer than patients'. Dentists formulated treatment plans based on medical indicators and treatment guidelines. Patients may have paid more attention to their own condition, comfort, and quality of life, and they may have focused on pain management, disease control, and health risk assessment. Dentists usually interpreted and provided medical information to patients based on their expertise and experience, using technical terminology and following medical conventions. Patients may have had difficulty understanding these technical terms and required simpler explanations and guidance. Dentists provided treatment options and recommendations based on medical knowledge and the patient's condition. However, patients may have made different decisions based on their values, beliefs, and personal circumstances. Sometimes, differences in medical perspectives could lead to conflicts of opinion and difficult decision-making. Therefore, through this study, it was hoped that the communication between doctors and patients could be improved, and the misunderstanding between the two parties caused by poor communication could be reduced.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

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