

Patient feedback with patient-centered dental care and its association with emotional intelligence: A cross-sectional study in undergraduate dental students at Prince of Songkla University

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Abstract

Objectives: To describe patient feedback concerning patient-centered dental care provided by undergraduates and examine its association with dental students' emotional intelligence (EI). **Methods:** The study population included 5th and 6th year dental students, academic year 2014, Prince of Songkla University (n = 122). One hundred and sixteen students agreed to participate in the study corresponding to a 95.08% participation rate. Each dental student completed the Department of Mental Health's Emotional Intelligence Questionnaire (DMH-EI), which is composed of 52 self-assessment items and 9 domains. At least 5 active patients of each dental student who met the inclusion criteria were contacted. Of the 745 patients who met the inclusion criteria, 412 (55.30%) participated in the study. After obtaining verbal consent, each patient was asked to provide information via telephone interviews about experiences, feedbacks, and overall satisfaction with patient-centered dental care. Descriptive statistics were used to describe the distribution of students EI scores and patients rating scores. Generalized estimating equations (GEE) were used to evaluate associations between EI and patient rating scores. **Results:** DMH-EI scores of the dental students were in a normal range except for the self-control domain, where majority had higher scores than the norm. About 96% of interviewed patients were very satisfied with the dental treatment received. A total score of DMH-EI was significantly associated with the total patient feedback score. When considering the association of each sub-EI domain, only 4 domains (DMH-self-control, DMH-problem solving, DMH-relationship, DMH-self-esteem) were significantly associated with the patient feedback score. **Conclusion:** This study indicates that higher EI scores are associated with positive feedback concerning patient-centered dental care provided by undergraduates.

Key words: Dental education; Emotional intelligence; Holistic care; Patient satisfaction

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Introduction

Emotional intelligence (EI) is a concept that emphasizes social-emotional competencies as important parts of performance effectiveness and health professional success. EI influences how well one recognizes and manages emotions and professional relationships with patients (1, 2). Social and emotional competencies have been demonstrated in a large and growing number of research to associate with academic success (1–8), job performance (9,10), and patient satisfaction (11). However, these psychological and educational studies used different instruments to measure EI and the results were varied (1–8).

The EI instrument currently used in research with the Thai population was initially developed by the Department of Mental Health (DMH) in 2000 due to the belief that Western assessments may not accurately measure EI in different socio-cultural contexts. The DMH-EI instrument conceptualizes EI as a set of three major domains: virtue, competence, and happiness. According to this conceptual framework, DMH-EI consists of a set of sub-competencies that help people to understand themselves, understand others, and manage internal and external conflicts. Virtue deals with self-control, sympathy, and social responsibility. Competence deals with self-motivation, problem-solving, and relationship management. Happiness is associated with self-esteem, life-satisfaction, and ability to manage one's emotions (12). Previous studies conducted with Thai medical and dental students reported that DMH-EI scores were in a normal range except for DMH-self-control scores, which were higher than the norm. Results also suggested that some aspects of DMH-EI were associated with academic and clinical performance (7,8).

To improve the quality of oral health care, the concept of patient-centered care has been implemented in the undergraduate clinic, Faculty of Dentistry, Prince of Songkla University (PSU) since 2005. Dental treatments are expected to

be patient-centered care and thus dental students provide comprehensive dental treatment based on a holistic concept. Patients are involved in the decision-making process and receive individualized treatment plans that consider the needs, context, and cultural background of the patients. The successful practice of patient-centered care is expected to increase the quality of oral health care and patient satisfaction (13–15). However, this task is challenging for both students and clinical instructors because it requires both academic intelligence and several essential non-cognitive skills that appear to be related to the EI competency of dental students, e.g., communication skills, patient management skills, and an ability to collaborate with others (11,13–15). However, there is little evidence available to suggest a correlation between the EI of dental students and the patient experience with patient-centered dental care received. In addition, patient satisfaction and experience with dental services now receive minimal attention in our dental school setting.

This study, therefore, aimed to investigate i) overall patient satisfaction and patient experience with the patient-centered dental care approach and ii) the associations between patient feedback scores and dental students EI scores.

Method

Setting and study participants

This cross-sectional study conducted at the Faculty of Dentistry, PSU. After getting approval from the institutional review board (EC5701-04-J-LR), one hundred and twenty two 5th and 6th year undergraduate students in the academic year of 2014 and their patients who had received comprehensive dental treatments were contacted. Of 122 dental students invited to participate in the study, 116 agreed to participate and provide a written notice of informed consent. They comprised 86 (74.1%) female and 58 (50%) 5th year undergraduate students. At least 5 active patients of each dental student met the following inclusion criteria of this study: i) aged 18 years , ii) received comprehensive dental treatment from

that student 4 times, and iii) their last visit ≤ 2 months. They were randomly selected and contacted. At the time of the study (June-October 2014), 1,774 patients were under dental care provided by the dental student clinic, with an average of 15 patients per each dental student. Of the 745 patients who met the inclusion criteria, 412 patients (55.30%) agreed to participate in the study and provided verbal consent.

EI Measures

EI was measured by using the DMH-EI screening test for adults 18-60 years old. This test contains 52 items and 9 sub-domains identified as self-control, sympathy, social responsibility, self-motivation, problem-solving, relationship management, self-esteem, life satisfaction, and ability to manage one's emotions. A Likert scale ranging from 1 (completely disagree) to 7 (completely agree) was used for the responses to the test items. An internet based form of the DMH-EI screening test was created and the dental students were instructed to complete.

Patients feedback with patient-centered dental care survey

A questionnaire was developed to assess stress levels, patient experiences with ill-tempered students, overall satisfaction, and feedback concerning patient-centered dental care in student clinics. Patients were asked to describe stress levels during dental treatment and experiences with ill-tempered students. We used a single question to measure general satisfaction: "Overall, how would you rate the dental care you received from dental students?" on a 3-point scale: *very satisfied*, *neutral*, and *less satisfied*. Thirty-one questions that asked for patient feedback concerning four aspects of patient-centered dental care: data collection, planning, treatment, and

oral health promotion were drafted and reviewed by three experts. A 5-point scale rating was used to assess level of agreement: *strongly agree*, *agree*, *neutral*, *somewhat disagree*, and *strongly disagree*. To assess content validity of the drafted survey questions, intra-class correlation coefficients (ICC) for each question were calculated and pilot testing was performed with 30 patients. Items that had an ICC < 0.67 were revised and removed in case of redundancy. The final questionnaire consisted of 21 items and took 15-20 minutes to complete. We surveyed patients by telephone. Five trained dental students administered the survey. The internal consistency of each aspect of the survey questions was measured by calculating Cronbach's alpha. The alpha coefficient for data collection, planning, treatment, and oral health promotion domains were 0.72, 0.81, 0.74, 0.82, respectively, suggesting that the items had relatively high internal consistency.

Statistical analysis

Frequency was used to describe distribution of patient responses to each questionnaire item. In the analysis, a 5-point scale rating to assess patient feedback was reduced down to *agree*, *neutral*, and *disagree*. To determine the relationship between patient feedback with patient-centered dental care and dental students EI, generalized estimating equations (GEE) for correlated categorical response data were used. To take into account the dependency of observations (i.e., more than one patient providing information for each student), an unbalanced, exchangeable working correlation structure was used. Parameter estimates and robust standard error along with p-value were reported. All analyses were carried out using STATA version 13.

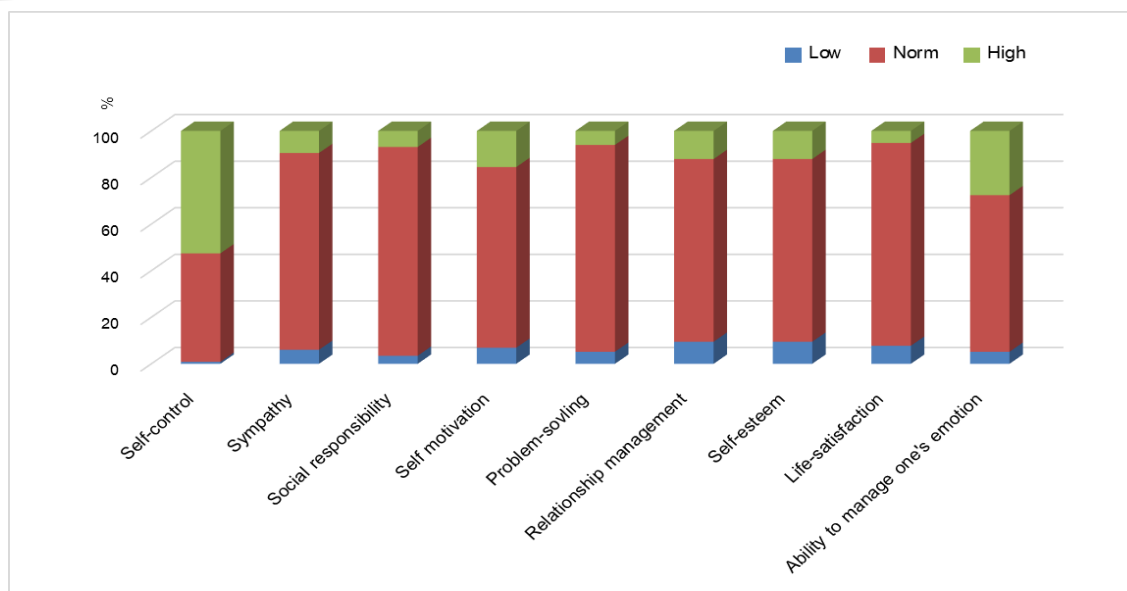


Figure 1: Emotional intelligence of dental undergraduates

Results

Distributions of sub-DMH-EI scores of dental students are presented in Figure 1. For each domain, the DMH-EI score was in a normal range except for the self-control domain, in which a majority had higher scores than the norm. The mean of the DMH-EI scores and its associations with the average scores of knowledge, laboratory skills, and clinical performance of this study cohort have been previously reported. Briefly, the mean total DMH-EI score was 161.72 ± 13.78 . The total DMH-EI score was weakly associated with laboratory scores, but not associated with knowledge and clinical performance scores. However, the sub DMH-EI scores of the following domains: DMH-problem-solving, DMH-self-esteem, and DMH-relationship, were associated with clinical performance scores (7).

A total of 412 patients completed the survey. Most interviewed patients were middle-aged (40.9 ± 0.8), while about 60% of the patients were female. Approximately 60% of the patients were available to come to the dental student clinic at least once a week, while almost one-third (18.5%) were available for dental appointments 3-5

days per week. About 44% of these patients had visited a Dental hospital for the first time within the last 2 years (Table 1).

Approximately 30% of the patients reported moderate to severe stress levels during dental treatment, a feeling which was similar to those who were treated by 5th and 6th dental students. Six patients (1.5%) reported an experience with ill-tempered dental students. Most patients treated by the dental students were very satisfied (95.6%) with the dental treatment they received (Table 2). The items with the top three scores that patients rated as *agree* were “Dental student apologized and took responsibility when he/she made a mistake” (99%) “Quality of treatment and service satisfied you” (97.1%) and “The dental student made you believe that you can take care of your oral health well and prevent recurrence of oral health problems” (96.3%). Whereas, these three items: “Between examination and history taking, the dental student asked you about your general data, e.g., family, life, job, etc.”, “The dental students asked you about your life during every visit.”, and “The dental student used media such as pictures and models to explain your oral health problem.”, were more frequently rated as

disagree than other items (12%, 4.8%, and 4.6%, respectively).

The results of the GEE analysis initially revealed several significant relationships among DMH-EI (both the total and sub-DMH-EI scores) and patient feedback. Higher overall patient feedback scores were positively associated with the total DMH-EI scores and sub-DMH-EI scores in the following domains: DMH-self-control, DMH-problem-solving, DMH-relationship,

and DMH-self-esteem. Among the four aspects of the dental procedures, data collection was most frequently related to several sub-DMH domains: DMH-motivation, DMH-problem-solving, DMH-relationship, DMH-self-esteem, and DMH-life satisfaction. However, the oral health promotion aspect was related to only DMH-self-control. Among sub-DMH-EI domains, DMH-self-esteem was the domain that was significantly associated with almost all aspects of dental procedures except for oral health promotion.

Table 1: Patients' characteristics

Patients' characteristics		Year 5	Year 6	All
		n = 167 n (col%)	n = 245 n (col%)	n = 412 n (%)
Gender				
	Male	63 (37.7)	108 (44.1)	171 (41.5)
	Female	104 (62.3)	137 (55.9)	241 (58.5)
Age (year)		39.3±1.9	42.0±1.1	40.9±0.8
Availability for dental appointment				
	3-5 days per week	26 (15.6)	50 (20.4)	76 (18.5)
	1-2 days per week	68 (40.7)	113 (46.1)	181 (43.9)
	1-3 days per month or less	73 (43.7)	82 (33.5)	155 (37.6)
First visit at Dental hospital within the last 2 years (2013-14)				
	Yes	76 (45.5)	103 (42.0)	179 (43.5)
	No	91 (54.5)	142 (58.0)	223 (56.5)

Table 2: Stress levels, patient experiences to ill-tempered students, and overall satisfaction

Patient experiences		Year 5	Year 6	All
		n = 167 n (col%)	n = 245 n (col%)	n = 412 n (%)
Stress levels during dental treatment				
	No stress to mild	117 (70.1)	179 (73.0)	296 (71.8)
	Moderate	41 (24.5)	56 (22.9)	97 (23.5)
	Severe	9 (5.4)	10 (4.1)	19 (4.6)
Experience to students' bad-tempered				
	Yes	3 (1.8)	3 (1.2)	6 (1.5)
	No	164 (98.2)	242 (98.8)	406 (98.5)
Overall satisfaction				
	Very satisfied	162 (97.0)	232 (94.7)	394 (95.6)
	Neutral	5 (3.0)	12 (4.9)	17 (4.1)
	Less satisfied	0	1 (0.4)	1 (0.2)

Table 3: Patient feedback to patient-centered dental care provided by dental students

Items		% Response		
		Disagree	Neutral	Agree
Data collection	Dental student gave you enough time to explain your oral health problems and concerns.	1.7	13.6	84.7
	Between examination and history taking, dental student asked you about your general data, e.g., family, life, job, etc.	12.0	21.8	66.2
	Dental student ask you about any problem or limitation for a treatment ,e.g., transportation, expense, available time, underlying disease, etc.	2.2	10.4	87.4
	Dental student asked you about your life during every visit.	4.8	12.4	82.8
Plan	Dental student described all of your oral health problems.	0.7	5.8	93.5
	Dental student gave you enough information about treatment options and explain details of each option, including advantage, disadvantage, time consuming, cost, and risks, to help you make a decision.	0.5	10.5	89.0
	Dental student suggested treatment plan which suitable for your need.	0.7	11.0	88.3
	The treatment plan include treatments other than you want and you feel comfortable with.	2.0	13.1	84.9
	Dental student used your opinion and limitation for adjust the plant to suit you.	1.0	9.1	89.9
	Your chief complaint was treated promptly	2.7	11.5	85.8
Treatment	Dental student treat you gently.	0.7	6.8	92.5
	Dental student apologized and took responsibility when he/she made a mistake.	0.3	0.7	99.0
	Dental student asked your feeling when he giving you treatment.	1.7	6.8	91.5
	Quality of treatment and service satisfied you.	0	2.9	97.1
	After treatment, dental always asked for your feedback.	0.5	3.9	95.6
Oral health promotion	Dental student use media such as pictures and models to explain your oral health problems.	4.6	10.4	85.0
	Dental student gave you an opportunity to tell about you behavior or experience that may be cause of your oral health problem.	3.9	13.8	82.3
	Other than gave treatment, dental student always gave you information about oral health care.	3.2	7.8	89.0
	Dental student instructed brushing technique and other proper oral hygiene care methods to you.	1.7	2.4	95.9
	You pay more attention to oral health after you were treated by dental student.	0.5	4.6	94.9
	Dental student made you believe that you can take care of your oral health well and prevent recurrence of oral health problems.	0.2	3.4	96.3

Table 4: Associations between patient feedback scores and dental students EI scores*

	Data collection	Plan	Treatment	Oral health promotion	Total scores
Self-control	0.144 (0.063) p = 0.063	0.082 (0.067) p = 0.222	0.062 (0.047) p = 0.193	0.156 (0.078) p = 0.044	0.441 (0.218) p = 0.043
Sympathy	0.107 (0.066) p = 0.105	0.078 (0.069) p = 0.255	0.053 (0.049) p = 0.276	0.054 (0.081) p = 0.507	0.291 (0.226) p = 0.198
Social responsibility	0.070 (0.071) p = 0.324	0.094 (0.072) p = 0.192	0.150 (0.050) p = 0.003	0.064 (0.086) p = 0.457	0.384 (0.240) p = 0.109
Self-motivation	0.101 (0.051) p = 0.048	0.062 (0.053) p = 0.240	0.044 (0.038) p = 0.249	0.042 (0.063) p = 0.500	0.245 (0.175) p = 0.162
Problem-solving	0.193 (0.059) p = 0.001	0.143 (0.061) p = 0.020	0.073 (0.045) p = 0.102	0.122 (0.075) p = 0.103	0.526 (0.205) p = 0.010
Relationship	0.160 (0.052) p = 0.002	0.121 (0.054) p = 0.027	0.058 (0.040) p = 0.145	0.127 (0.065) p = 0.051	0.465 (0.180) p = 0.010
Self-esteem	0.275 (0.066) p < 0.001	0.196 (0.070) p = 0.005	0.156 (0.050) p = 0.002	0.152 (0.085) p = 0.074	0.777 (0.231) p = 0.001
Life-satisfaction	0.113 (0.045) p = 0.012	0.064 (0.047) p = 0.180	0.048 (0.034) p = 0.154	0.047 (0.057) p = 0.409	0.269 (0.157) p = 0.087
Ability to manage one's emotion	0.062 (0.046) p = 0.176	0.011 (0.048) p = 0.825	0.008 (0.034) p = 0.806	0.015 (0.057) p = 0.785	0.093 (0.159) p = 0.558
DMH total	0.026 (0.008) p = 0.001	0.017 (0.009) p = 0.048	0.013 (0.006) p = 0.044	0.016 (0.010) p = 0.130	0.071 (0.029) p = 0.013

*To testing for the associations between DMH-scores and patient feedback scores, GEE models were used. The regression coefficient parameter and standard error: β (SE) of each tested association along with its p-value were reported.

Discussion

This study is the first investigation of the DMH among Thai dental students and its association with patient feedback concerning dental care received under the patient-centered concept. Our study provided support for the importance of non-cognitive skills to dental students' clinical success as assessed from the patient's perspective.

Dentistry is the work professionals. In order to deliver a successful dental treatment, students have to apply knowledge and skills from didactic courses to clinical practice (4,11,16). Research in the area of EI provided important data regarding what else is necessary for exceptional professional performance. Previous studies have reported that cognitive ability or academic intelligence was essential in professional work, but neither was sufficient to assure professional excellence. The non-cognitive factors of dental student performance

,e.g., communication skills, patient management skills, and an ability to collaborate with others and lead teams, are considered essential for clinical effectiveness (4,16). These skills are strongly related to EI ability (3,4). Our previous analysis using this study sample showed that none of the sub-DMH-EI domain was associated with average knowledge or laboratory scores, but significantly associated with clinical performance scores as evaluated by instructors. These domains were DMH-relationship, DMH-problem-solving, and DMH-self-esteem (7). In the present analysis, we focused on the patient's perspective toward dental care received (i.e., patient feedback scores) as the outcome of interest. The results highlighted that those three sub-DMH-EI domains remained significantly associated with two clinical procedures: data collection and treatment planning. In other words, students who had higher scores on these three sub-DMH-EI domains were more likely to

receive positive feedback from patients, which is explained in the following paragraph.

Data collection and treatment planning are first two important steps to deliver effective dental care under the patient-centered concept as dental students have to engage their patients in a clinical decision-making process. Effective doctor-patient communication will help to identify patients' needs, perceptions, and expectations as well as facilitate comprehension of health information (17). Students are likely to collect most of the necessary data (e.g., the patient's general and dental health, individual needs, preferences, and personal circumstances) for treatment planning at the first dental visit. Students spend time in face-to-face contact with patients gathering information and, developing a dentist-patient relationship at the same time. At the initial meeting, patients may be reluctant or feel uncomfortable sharing private information, discussing bad habits, or talking about their lifestyles. However, students who are able to build trust and close relationships with patients, will obtain this information to make the best treatment plan for their patients (3,11,17).

Problem-solving is another essential skills for dental students. Students solve problems on a daily basis, in day-to-day lives, in academic situations, and in patient care. In a clinical situation, students are involved in a complex management situation between themselves and others (patients, clinical instructors, support staff, and peers). Students who are skillful in this aspect will be able to evaluate information obtained from patients, consider various possible treatment options, and help patients to make decisions concerning an optimal treatment plan (18). Self-esteem is a belief and confidence in one's own ability and value. Students with low self-esteem are unable to take on these challenges and have difficulties communicating with colleagues and patients and, as a result, may display immature behavior. This characteristic can negatively affect confidence in the dentist-patient relationship, and therefore patients more frequently provide negative feedback to dental students with low self-esteem. The present study

also found that higher DMH-self-esteem scores were associated with higher patient feedback on the treatment aspect.

Although overall patient satisfaction and patient ratings on quality of patient-centered dental care received was generally high in this study, there were several areas that required more attention to improve the quality of care in the undergraduate comprehensive clinic. For example, more than 10% of interviewed patients disagreed that dental students asked them about any problem or limitations for a treatment. As previously discussed, this information was important input for effective treatment planning. About 5 % of interviewed patients disagreed that dental students asked about their living in every visit or that dental students used media, such as pictures and models to explain the patient's oral health problems. Simple conversations with patients, like asking about their lives during every visit, demonstrates to the patients that dentists understand their situations and care about their feelings. Such exchanges help students establish dentist-patient relationships, which, in turn increase patient adherence to treatment. To offer a model of patient-centered care, effective patient education should enhance self-care motivation, improve oral health status, and promote lifelong oral health self-care (16,19, 20). Thus, students should be aware that appropriate oral health promotion materials facilitate dentist-patient communication and raise patient's oral health awareness, and that they should engage patients in shared decision-making concerning dental treatments and preventive plans. However, the fact that those items received lower scores may be due to differences between students' and patients' perceptions of patient-centered care (21).

Conclusion

This study indicates that higher EI scores are associated with positive feedback concerning patient-centered dental care provided by undergraduates.

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ผลประเมินของผู้ป่วยต่อการดูแลทางทันตกรรมที่มีผู้ป่วยเป็นศูนย์กลางและความสัมพันธ์กับความ ฉลาดทางอารมณ์: การศึกษาแบบตัดขวาง ในนักศึกษาทันตแพทย์ มหาวิทยาลัยสงขลานครินทร์

บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาผลการประเมินของผู้ป่วยต่อการดูแลทางทันตกรรมที่มีผู้ป่วยเป็นศูนย์กลาง และความสัมพันธ์กับระดับความฉลาดทางอารมณ์ของนักศึกษาทันตแพทย์ **วิธีการ:** ประชากรในการศึกษานี้คือ นักศึกษาทันตแพทย์ มหาวิทยาลัยสงขลานครินทร์ ชั้นปีที่ 5 และ 6 ประจำปีการศึกษา 2557 จำนวน 122 คน โดยนักศึกษาจำนวน 116 คน คิดเป็นร้อยละ 95.0 ยินยอมเข้าร่วมการศึกษา นักศึกษาแต่ละคนทำแบบทดสอบความฉลาดทางอารมณ์ของกรมสุขภาพจิตกระทรวงสาธารณสุข ซึ่งประกอบด้วย 9 ด้านย่อย รวม 52 ข้อ ผู้ป่วยอย่างน้อย 5 คน ของนักศึกษาแต่ละคนที่เข้าเกณฑ์ข้อกำหนดของการศึกษา จำนวนรวมทั้งสิ้น 745 คน ได้รับการติดต่อ ผู้ป่วยจำนวน 412 คน คิดเป็นร้อยละ 55.30 ยินยอมเข้าร่วมการศึกษา และตอบแบบสอบถามเกี่ยวกับประสบการณ์ ประเมินผลในด้านต่าง ๆ และความพึงพอใจต่อการดูแลทางทันตกรรมโดยนักศึกษาทันตแพทย์ที่มีผู้ป่วยเป็นศูนย์กลางผ่านการสัมภาษณ์ทางโทรศัพท์ สถิติเชิงพรรณนาใช้แสดงร้อยละของระดับความฉลาดทางอารมณ์ของนักศึกษาและระดับการประเมินของผู้ป่วยในหัวข้อต่าง ๆ สมการประมาณค่าโดยนัยทั่วไป (*Generalized estimating equations: GEE*) ใช้วิเคราะห์ความสัมพันธ์ระหว่างคะแนนความฉลาดทางอารมณ์ของนักศึกษาทันตแพทย์และคะแนนประเมินของผู้ป่วย **ผลการศึกษา:** ระดับความฉลาดทางอารมณ์ของนักศึกษาทันตแพทย์ในด้านต่าง ๆ อยู่ในช่วงปกติ ยกเว้นในด้านการควบคุมตนเอง (*self-control*) ที่ส่วนใหญ่มีค่าสูงช่วงค่าปกติ ผู้ป่วยร้อยละ 96 พึงพอใจต่อการดูแลทางทันตกรรมที่ได้รับจากนักศึกษาทันตแพทย์ คะแนนรวมความฉลาดทางอารมณ์ คะแนนความฉลาดทางอารมณ์ด้านย่อย 4 ด้าน ได้แก่ การควบคุมตนเอง (*self-control*) การตัดสินใจแก้ปัญหา (*problem solving*) การมีสัมพันธภาพ (*relationship*) และความภูมิใจในตนเอง (*self-esteem*) ของนักศึกษาทันตแพทย์มีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติกับคะแนนประเมินของผู้ป่วย **สรุป:** การศึกษานี้พบว่าระดับความฉลาดทางอารมณ์ของนักศึกษาทันตแพทย์มีความสัมพันธ์เชิงบวกกับผลประเมินการดูแลทางทันตกรรมที่มีผู้ป่วยเป็นศูนย์กลาง

คำสำคัญ: ทันตแพทย์ศาสตร์ศึกษา; ความฉลาดทางอารมณ์; การดูแลสุขภาพแบบองค์รวม; ความพึงพอใจของผู้ป่วย