



Case Experiences, Attitudes, and Educational Environment of Dental Public Health Students in Thailand

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Abstract

Dental public health officers in Thailand lack standardized training requirements across institutions. This study aimed to assess case experiences, attitudes toward dental practice, and educational environmental factors among final-year dental public health students from multiple colleges to inform curriculum standardization. A cross-sectional study was conducted in October – November 2024 among 200 final-year dental public health students from five colleges representing all regions of Thailand with 167 respondents. Data were collected using a validated 4-part questionnaire covering demographics, case experiences, attitudes (5-point scale), and educational environment (modified DREEM). Descriptive statistics, Kruskal-Wallis and Post-hoc tests were used for analysis. The results indicated that students performed a median of 7.00 oral treatment records, 12.00 tooth sealants, and 7.00 Class I resin composite fillings. Most students had moderate-level attitudes toward dental practice (mean score: 2.79 ± 0.41 out of 5). Overall educational environment was rated as 'more positive than negative' (69.7%). Significant variations between colleges were found in all nearly dental procedure experiences ($p < 0.05$), overall attitudes ($H = 15.377$, $p = 0.004$), and teacher perception ($H = 19.342$, $p = 0.001$). Thai dental public health students demonstrate competency in most dental procedures but show significant inter-college variations in clinical experiences, attitudes, and teacher perception, indicating need for curriculum standardization. Colleges should establish minimum case requirements for graduation and standardize teaching methods through inter-institutional collaboration. The Ministry of Public Health should clarify the scope of dental practice for dental public health officers.

Keywords: Dental public health officer, Clinical experience, Educational environment, Attitude, Curriculum evaluation, Thailand

What was Known

- Sirindhorn College of Public Health, consisting of seven academies in all parts of Thailand, is the only institute that offers a dental public health curriculum. Nevertheless, they do not specify the minimum dental practice requirements for graduating students.
- The assessment of the educational environment factors and attitudes of students can facilitate the implementation and evaluation of modifications to curricula, instructional methods, and the physical setting. Currently, there are no investigations regarding educational environmental factors and attitudes toward dental practice among dental public health students in Thailand.

What's New and Next

- Dental public health students had a statistically significant variation in a number of case experiences, attitudes toward dental practice, and perception of teachers between colleges. Therefore, all colleges should cooperate to standardize the teaching process.
- Sirindhorn College of Public Health should define the minimum cases for dental practice among students to allow students to have more experiences in some works.

Introduction

The Sirindhorn College of Public Health (SCPH), operating under the Praboromarajchanok Institute, serves as the exclusive provider of the Bachelor of Public Health (Dental Public Health) program in Thailand, which aims to produce public health officers (dental public health) who are known and work as dental nurses in Thailand, with a mission for oral health prevention and treatment for people in community sanitariums and schools⁽¹⁾. Since that time, the role and curriculum of the dental nurse have developed to be that of a public health officer (dental public health), who has responsibility for public health management and also oral health prevention, promotion, and treatment⁽²⁾. Sirindhorn College of Public Health has included seven branches in five parts of Thailand. Although the Bachelor of Public Health (Dental Public Health) curriculum has been implemented across all colleges for over five years, standardized clinical requirements remain unestablished. The current stands in contrast to the dentist profession, which adheres to rigorous minimum requirements mandated by the Dental Council^(3,4). Furthermore, significant ambiguity persists regarding the clinical scope of practice, as neither academic institutions nor the

Ministry of Public Health has provided a broad definition for "simple" dental treatments⁽⁵⁾. This lack of conceptual clarity creates instructional uncertainty for lecturers and results in multifaceted challenges that likely lead to variations in clinical experiences among students^(6,7). Existing evidence suggests that the volume of clinical practice is directly correlated with student confidence and proficiency^(8,9). Consequently, the absence of mandated minimum clinical benchmarks prior to graduation may undermine the professional credibility of graduates among employers, patients, and the community. Variations in institutional performance, such as the proportion of the first comprehensive examination pass rates, may indicate that diverse factors—including clinical experience, lecturer expertise, the number of teachers, and geographic location—influence educational outcomes. The evaluation of the educational environment is widely used in health professional programs⁽¹⁰⁾, and evidence demonstrates that perceptions of the academic atmosphere and professional attitudes significantly influence student self-efficacy⁽¹¹⁾. Currently, research on Thai dental public health students is limited with only one study examining preventive dentistry attitudes at a single college⁽¹²⁾. This study intends to investigate clinical case experiences, educational environment factors (particularly perceptions of teachers, atmosphere, and social support), and attitudes about the dental practice on a national level. Comprehending these three areas is crucial for a comprehensive curriculum assessment, since they collectively influence the professional preparedness of graduates. This research can provide an empirical baseline by assessing inter-college variations, which could determine the standardization of instructional approaches and improve curriculum development through inter-institutional collaboration. Specifically, the findings will provide the necessary evidence to establish national minimum clinical case requirements, ensuring a unified standard of proficiency across all colleges.

Materials and Methods

1. Study design and study setting

The study used a cross-sectional descriptive approach and collected data with final-year dental public health students that had a total number of 286 people throughout Thailand. Sample size was calculated using the N4Studies program with the finite population proportion formula⁽¹³⁻¹⁶⁾, in which the proportion (p) is 0.5, the error (d) is 0.05, and alpha (α) is 0.05. The required minimum sample size for collecting is 165. Subsequently, we employ purposive sampling in selecting one college from each region, ensuring representation of each part of Thailand⁽¹⁷⁾. Regions with two institutions, specifically the Northeast and the South, were chosen using

computer-generated simple random sampling. Eventually, we have Sirindhorn College of Public Health, Phitsanulok (SCPHPL), Sirindhorn College of Public Health, Ubon Ratchathani (SCPHUB), Sirindhorn College of Public Health, Suphanburi (SCPHSP), Sirindhorn College of Public Health, Chonburi (SCPHC), and Sirindhorn College of Public Health, Yala (SCPHYL) as representatives comprising 200 students from all colleges. The survey form was made accessible for one month, from October 1 to October 31, 2024, correlating with the completion of the clinical practice course at the student dental clinic before starting the students' internship in the community. This phase is the optimal time that can collect the precise number of case experiences.

2. Participation recruitment

Subsequent to obtaining ethical permission from the Ethics Committee of Sirindhorn College of Public Health, Ubon Ratchathani (SCPHUB S027/2567), the researcher collaborated with the dental public health departments of five participating colleges. All students across five colleges enrolled in the final year, including those repeating the academic year, were eligible and invited to participate in the study were provided with the Google form survey link by their campus lecturers. Each email is allowed to submit the survey form only once to avoid duplicate responses; nevertheless, the identity of students and institutions will remain confidential, with results reported solely in a summary format. The initial page of the Google form explained the research objective, the voluntary aspect of participation, and the ability of rejecting or terminate the survey at any point. The data could benefit the curriculum; nevertheless, no participants are receiving reward. Participants who intended to engage in the survey were obligated to click “accept” to grant consent before initiation. Out of 167 respondents, results in an 83.5% response rate, two were excluded during the data cleaning process result of inconsistent responses. The conclusive analysis was conducted on 165 valid responses.

3. Data collection

The questionnaire was divided into four sections:

Section A was designed to collect generic data.

Section B focused on the self-report number of dental procedures performed in a student dental clinic, which participants reported based on their experiences with real patients from the integral clinic-1 course (2nd semester of 3rd year) to the end of the integral clinic-2 course (1st semester of 4th year), dental procedures in the questionnaire applied from the dental student requirement of the Dental Council of Thailand⁽³⁾ and the report of dental public health competencies by the Thai Dental Council⁽⁵⁾.

Section C was a questionnaire evaluating students' attitudes toward dental practice in a student dental clinic in 15 items using a five-point Likert scale⁽¹⁸⁾. For positive questions, scores ranged from 1 (Strongly Disagree) to 5 (Strongly Agree). For negative questions, the score was reversed. The mean scores were interpreted based on Best's criteria (1997)⁽¹⁹⁾; the attitudes were categorized into three levels: high attitude, mean score of 3.67–5.00; moderate attitude, mean score of 2.34–3.66; and low attitude, mean score of 1.00–2.33.

Section D was the educational environment using 32 items modified from the Dundee Ready Education Environment Measure (DREEM)^(20,21), measured on a 5-point Likert scale (0 = Strongly Disagree to 4 = Strongly Agree). The instrument was structured into three specific domains: Teachers (11 items), Learning Atmosphere (12 items), and Social Self-Perception (9 items). To ensure the study remained focused on the clinical practice environment rather than general classroom pedagogy, the 'Perception of Learning' and 'Students' Academic Self-Perceptions' domains were excluded. This refinement also served to minimize participant fatigue and enhance the reliability of the responses. Conversely, to better reflect the local context of regional colleges, the 'Students' Social Self-Perceptions' domain was expanded from seven to nine items by incorporating two context-specific variables: 'convenience of travel to the college' and 'campus safety.' The total cumulative score (maximum 128) was interpreted as very poor (0–32), plenty of problems (33–64), more positive than negative (65–96), or excellent (97–128). Specifically, the scores for the 9-item Social Self-Perception domain were categorized as 'not a happy place' (0–9), 'not a nice place' (10–18), 'not too bad' (19–27), and 'very good' (28–36).

Content validity was validated by three dental public health and education experts with 10–18 years of experience. Content validity was assessed using the Index of Item-Objective Congruence (IOC), with a minimum acceptable threshold of 0.50. According to the experts' comments, three items—the cumulative GPA, the number of siblings, and the monthly parental income—were improved for clarity and to better fit the goals. The remaining items achieved IOC scores ranging from 0.66 to 1.00, indicating a high level of content validity. The pilot was conducted with 30 final-year dental public health students from SCPHTR, and the results have been excluded from the analysis in this study. Cronbach's alpha for attitudes toward dental practice was 0.84, whereas for educational environment factors, it was 0.92.

4. Statistical analyses

Data cleaning and statistical analyses were performed using IBM SPSS version 23. Most clinical variations, including high values in 'drug prescribing', were retained; however, one erroneous

'radiographic examination' entry (value = 100) was excluded (n=164). Frequencies, percentages, mean, standard deviation, median, and IQR were used to summarize descriptive data. Kruskal-Wallis tests were used to analyze the differences in case experiences, attitudes toward dental practice, and educational environmental factors between colleges because the data did not meet parametric assumptions⁽²²⁾ Subsequently conducted post-hoc analysis to clarify the variations within each pair.

Result

1. Generic data of respondents

Demographic data for the 165 respondents are detailed in Table 1. Participants were distributed across five colleges, predominantly female, and mostly achieved a cumulative GPA above 3.00.

Table 1: Respondents' characteristics, n = 165

Characteristics	level	Frequency, <i>n</i> (%)
Gender	Female	151 (91.5)
	Male	14 (8.5)
Age	20 - 24 years old	162 (98.2)
	25 - 28 years old	3 (1.8)
	Median: 22, IQR:1, Minimum: 20,	
	Maximum 28	
College	SCPHPL	37 (22.4)
	SCPHUB	32(19.4)
	SCPHSP	27(16.4)
	SCPHC	38(23.0)
	SCPHYL	31(18.8)
Marital status	Single	165(100.0)
Cumulative average grade (1 st - 3 rd year)	4.00 - 3.30	40(24.2)
	3.29 - 3.00	72(43.6)
	2.99 - 2.30	53(32.1)

2. The number of dental procedures performed in a student dental clinic

To adhere to research ethics and maintain institutional confidentiality, the names of the five participating colleges have been blinded and are represented by the letters A, B, C, D, and E. The clinical experiences of final-year dental public health students varied significantly across institutions in nearly all recorded procedures ($p < 0.05$).

In the domain of oral examination and treatment planning, significant inter-institutional differences were observed in oral treatment records ($p < 0.001$) and radiographic examinations ($p < 0.001$). Students at College E (Median = 8.00) and College D (Median = 6.00) recorded significantly higher median experiences in oral treatment records than those at College A and B (Median = 2.00). Regarding radiographic examinations, College C reported the highest median experience (16.00), which was significantly greater than the levels at College A (7.00), College D (5.00), and College E (6.00).

In the domain of oral health prevention, pit and fissure sealants were the most frequently performed procedure (Total Median = 12.00), with College E showing a substantially higher output (Median = 20.00) compared to College D (Median = 8.00). Tooth brushing instruction and fluoride application also varied significantly among institutions ($p < 0.001$). College A reported the highest median for tooth brushing instruction (11.00). For fluoride application, College E (Median = 9.00), College D (Median = 8.00), and College B (Median = 6.00) showed significantly higher median experiences than College A (Median = 3.00), but lower than College C (Median = 13.00). Furthermore, there were significant variations between colleges for oral health care for the elderly (Median = 3.00, $p = 0.002$) and dependent patients (Median = 1.00, $p = 0.008$).

Regarding dental operative treatment, Resin composite filling Class I was the most common restorative task (Total Median = 7.00), with students at College C, E (Median = 10.00), and College D (Median = 7.00) performing significantly more cases than those at College A and B (Median = 5.00, $p < 0.001$). A unique disparity was found in rubber dam application ($p < 0.001$), where College D reported a median of 5.00, whereas the median at all other colleges was zero. For complex restorations, College A reported the highest median for Class III fillings (5.00, $p < 0.001$), while College C and E performed significantly more Class II fillings (Median = 6.00, $p < 0.001$) than College D (Median = 1.00).

In dental surgery treatment, experience in prescribing medications showed extreme variation ($p < 0.001$), with College C reporting a median of 10.00 compared to a median of zero at

College B. For simple and primary tooth extractions (Total Median = 4.00), College A and College E recorded significantly more extractions than College D (Median = 3.00), while College A was also significantly higher than College B (Median = 3.00, $p < 0.001$). Finally, for gingivitis treatment, students performed a total median of 6.00 tooth scalings ($p = 0.003$), with College E showing significantly higher experience (Median = 11.50) than College B (4.00) and College C (5.00) as shown in Table 2.

Table 2 : Number of dental procedures performed in a student dental clinic (n=165)

Clinical Procedures	Total (n=165)	College A	College B	College C	College D	College E	<i>p</i>
Oral examination and treatment plan							
Oral treatment record	3.00 (6) [0-20]	2.00(1) ^a [1-3]	2.00(9) ^{ab} [1-15]	3.00(2) ^{ab} [0-10]	6.00(8) ^b [1-20]	8.00(9) ^b [1-20]	<0.001*
Radiographic examination ^x	7.00 (7) [1-24]	7.00(2) ^a [1-12]	10.00(8) ^{ab} [1-20]	16.00(10) ^b [1-24]	5.00(5) ^a [1-20]	6.00(9) ^a [1-20]	<0.001*
Dysphagia assessment	0.00(1) [0-20]	0.00(0) [0-2]	0.00(1) [0-13]	0.00(0) [0-3]	0.00(1) [0-10]	0.00(0) [0-3]	0.225
Oral health prevention							
Tooth brushing instruction	7.00 (6) [1-40]	11.00(5) ^c [1-22]	10.00(7) ^{bc} [1-40]	5.00(3) ^a [1-20]	4.00(8) ^{ab} [1-30]	6.50(9) ^{ab} [1-20]	<0.001*
Fluoride application (gel/varnish)	8.00 (10) [0-50]	3.00(2) ^a [1-5]	6.00(6) ^b [1-50]	13.00(3) ^c [1-25]	8.00(7) ^b [0-30]	9.00(9) ^b [1-20]	<0.001*
Pit and fissure sealants	12.00 (11) [0-45]	12.00(8) ^{abc} [1-27]	10.00(6) ^{ab} [1-26]	15.00(9) ^{bc} [1-40]	8.00(6) ^a [0-30]	20.00(29) ^c [1-45]	<0.001*
Silver diamine fluoride application	0.00(0) [0-10]	0.00(0) [0-2]	0.00(0) [0-10]	0.00(0) [0-10]	0.00(0) [0-0]	0.00(0) [0-5]	0.135
Oral potentially malignant disorders screening	0.00(0) [0-10]	0.00(0) (0-1)	0.00(1) [0-5]	0.00(0) [0-10]	0.00(1) [0-9]	0.00(0) [0-2]	0.072

Table 2 : Number of dental procedures performed in a student dental clinic (n=165) (Cont.)

Clinical Procedures	Total (n=165)	College A	College B	College C	College D	College E	p
Counselling for smoking or electronic cigarette cessation	0.00(1) [0-10]	0.00(1) [0-5]	0.00(1) [0-10]	0.00(1) [0-10]	0.00(1) [0-10]	0.00(0) [0-5]	0.440
Oral health care for dependent patients	0.00(0) [0-10]	0.00(1) ^a [0-2]	1.00(2) ^b [0-5]	0.00(1) ^a [0-10]	0.00(1) ^{ab} [0-3]	1.00(1) ^{ab} [0-5]	0.008*
Oral health care for elderly	1.00(2) [0-50]	1.00(1) ^a [0-2]	3.00(4) ^b [0-50]	1.00(3) ^a [0-10]	1.00(2) ^a [0-30]	1.00(1) ^{ab} [0-30]	0.002*
SMART technique restorations	0.00(0) [0-30]	0.00(0) [0-1]	0.00(1) [0-16]	0.00(0) [0-30]	0.00(1) [0-10]	0.00(0) [0-12]	0.146
Dental operative treatment							
Rubber dam application	0.00 (0) [0-20]	0.00(0) ^a [0-0]	0.00(0) ^a [0-1]	0.00(0) ^a [0-10]	5.00(7) ^b [1-20]	0.00(0) ^a [0-1]	<0.001*
Class I Resin composite filling	7.00 (6) [1-32]	5.00(4) ^a [1-19]	5.00(4) ^a [1-10]	10.00(5) ^b [1-20]	7.00(6) ^{ab} [1-15]	10.00(14) ^b [1-32]	<0.001*
Class II Resin composite filling	4.00(4) [0-16]	4.00(2) ^{bc} [1-8]	2.00(2) ^{ab} [1-5]	6.00(2) ^c [1-10]	1.00(3) ^a [0-8]	6.00(7) ^c [1-16]	<0.001*
Class III Resin composite filling	2.00 (3) [0-10]	5.00(2) ^d [1-8]	1.00(0) ^b [0-4]	2.00(2) ^c [0-10]	0.00(1) ^a [0-5]	3.00(4) ^c [0-8]	<0.001*
Class IV Resin composite filling	1.00 (1) [0-10]	0.00(1) ^a [0-1]	0.00(1) ^a [0-3]	2.00(2) ^b [0-10]	0.00(1) ^a [0-1]	1.00(2) ^b [0-6]	<0.001*
Class V Resin composite filling	1.00(1) [0-10]	1.00(0) ^b [0-4]	1.00(0) ^b [1-5]	2.00(1) ^c [1-10]	0.00(0) ^a [0-3]	1.00(2) ^{bc} [0-5]	<0.001*

Table 2 : Number of dental procedures performed in a student dental clinic (n=165) (Cont.)

Clinical Procedures	Total (n=165)	College A	College B	College C	College D	College E	p
Class VI Resin composite filling	0.00 (0) [0-10]	0.00(0) ^a [0-1]	0.00(0) ^a [0-1]	0.00(1) ^b [0-10]	0.00(0) ^a [0-1]	0.00(1) ^b [0-5]	<0.001*
Amalgam filling	1.00(2) [0-10]	3.00(2) ^c [0-6]	1.00(0) ^b [1-2]	0.00(1) ^a [0-10]	0.00(1) ^a [0-2]	1.00(0) ^b [0-7]	<0.001*
Temporary filling with Cavit/IRM	1.00(2) [0-12]	4.00(4) ^c [0-12]	1.00(1) ^a [0-1]	1.00(2) ^{ab} [0-10]	2.00(3) ^{bc} [0-10]	1.00(2) ^{ab} [0-7]	<0.001*
GIC / Calcium hydroxide liners	1.00(2) [0-25]	1.00(3) [0-4]	1.00(1) [0-3]	1.00(2) [0-10]	1.00(2) [0-5]	1.00(1) [0-25]	0.031*
Dental surgery							
Management of systemic disease patient	0.00 (1) [0-10]	1.00(1) [0-2]	0.00(1) [0-3]	0.00(1) [0-10]	0.00(0) [0-3]	0.00(1) [0-2]	0.332
Simple /Primary tooth extraction	4.00(4) [0-15]	6.00(1) ^c [1-8]	3.00(1) ^{ab} [1-7]	5.00(6) ^{abc} [0-10]	3.00(3) ^a [0-8]	5.00(7) ^{bc} [1-15]	<0.001*
Prescribing drugs associated oral treatment	3.00 (5) [0-100]	3.00(4) ^b [0-8]	0.00(1) ^a [0-3]	10.00(60) ^c [1-100]	3.00(2) ^b [0-8]	4.00(5) ^b [0-15]	<0.001*
Gingivitis treatment							
Scaling	6.00 (8) [0-30]	7.00(7) ^{ab} [0-12]	4.00(2) ^a [1-10]	5.00(4) ^a [1-10]	3.00(8) ^{ab} [1-25]	11.50(14) ^b [0-30]	0.003*

Notes : ^x: n = 164 ; one extreme outlier (value = 100) were excluded , Data are presented as Median (IQR) in the first row and [Min – Max] in the second row for each procedure.*Kruskal-Wallis test was used for overall comparison. ^{a,b,c} Different superscript letters within the same row indicate significant differences at p < 0.05. Groups sharing the same letter are not significantly different.

3. Attitudes toward dental practice in student dental clinics

Most students had the highest mean of attitude toward practicing in student dental clinics in the topic “It is necessary to instruct all patients on proper tooth-brushing techniques.” (4.47 ±

0.82, strongly agree 60.0%), followed by “Moisture contamination control is necessary in resin sealant and resin composite filling” (4.43 ± 0.95 , strongly agree 62.4%). Students had the lowest mean of attitude in the topic “Tooth restoration with resin composite is better than amalgam material in all cases” (3.26 ± 1.20 , disagree 29.7%). The differences in attitude summary were analyzed with the Kruskal-Wallis test; it had statistically significant variations between colleges ($H = 15.377, p = 0.004$) as shown in Table 3. Students had an overall attitude score at a moderate level (2.79 ± 0.41 , out of 5).

Table 3 : Attitudes toward dental practice in student dental clinics, n = 165

Question	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)	Mean (SD)	Interpretation
1. It is necessary to instruct all patients on proper tooth-brushing techniques.	99 (60.0)	55 (33.3)	4 (2.4)	4 (2.4)	3 (1.8)	4.47 (0.82)	High
2. Tooth scaling should be treated only when the patient asks. ^r	7 (4.2)	13 (7.9)	21 (12.7)	80 (48.5)	44 (26.7)	3.85 (1.04)	High
3. Deliberately taking a history helps in the proper planning of treatment.	82 (49.7)	69 (41.8)	8 (4.9)	3 (1.8)	3 (1.8)	4.36 (0.81)	High
4. Topical fluoride application is a not valuable method for dental caries prevention. ^r	13 (7.9)	25 (15.2)	20 (12.1)	49 (29.7)	58 (35.2)	3.69 (1.30)	High

Table 3 : Attitudes toward dental practice in student dental clinics, n = 165 (Cont.)

Question	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)	Mean (SD)	Interpretation
5. Teaching dental floss to patients in the clinic wastes time. ^r	7 (4.2)	16 (9.7)	11 (6.7)	40 (24.2)	91 (55.2)	4.16 (1.17)	High
6. Moisture contamination control is necessary in resin sealant and resin composite filling.	103 (62.4)	46 (27.9)	6 (3.6)	4 (2.4)	6 (3.6)	4.43 (0.95)	High
7. You can use only ultrasonic scaling instead of manual scaling in every situation. ^r	11 (6.7)	26 (15.8)	32 (19.4)	47 (28.5)	49 (29.7)	3.59 (1.25)	Moderate
8. Radiographic examination is necessary for a patient who has pain symptoms. ^r	9 (5.5)	16 (9.7)	25 (15.2)	69 (41.8)	46 (27.9)	3.77 (1.12)	High
9. Proper dietary instruction is the core of oral health prevention.	65 (39.4)	81 (49.1)	13 (7.9)	3 (1.8)	3 (1.8)	4.22 (0.81)	High

Table 3 : Attitudes toward dental practice in student dental clinics, n = 165 (Cont.)

Question	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)	Mean (SD)	Interpretation
10. Tooth restoration with resin composite is better than amalgam material in all cases. ^r	16 (9.7)	28 (17.0)	45 (27.3)	49 (29.7)	27 (16.4)	3.26 (1.20)	Moderate
11. Continuous follow-up is crucial in the prevention of disease recurrence.	81 (49.1)	69 (41.8)	11 (6.7)	2 (1.2)	2 (1.2)	4.36 (0.77)	High
12. Child behavioral management is not necessary in dental service. ^r	15 (9.1)	21 (12.7)	17 (10.3)	48 (29.1)	64 (38.8)	3.76 (1.33)	High
13. Strict wear of personal protective equipment (PPE) is crucial in every process of dental treatment.	78 (47.3)	60 (36.4)	19 (11.5)	5 (3.0)	3 (1.8)	4.24 (0.91)	High
14. Smoking cessation counseling is the duty of dental care providers.	35 (21.2)	64 (38.8)	44 (26.7)	15 (9.1)	7 (4.2)	3.64 (1.05)	Moderate

Table 3 : Attitudes toward dental practice in student dental clinics, n = 165 (Cont.)

Question	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)	Mean (SD)	Interpretation
15. Pain and fear management in patients is an essential skill in oral health services.	83 (50.3)	63 (38.2)	12 (7.3)	4 (2.4)	3 (1.8)	4.33 (0.86)	High
Summary	Mean: 2.79 SD: 0.41 $H = 15.377$, $p = 0.004^*$						

Notes : ^r = items were reverse-scored (1 = Strongly Agree to 5 = Strongly Disagree) so that a higher mean indicates a more positive attitude. SD = standard deviation, Min = Minimum, Max = Maximum, H = Kruskal-Wallis Tests, * = correlation is significant at 0.01 level (2 – tailed).

4. Perception of educational environmental factors among dental public health students.

The results had indicated that students had overall scoring in “more positive than negative” (69.7%; n = 115), followed by “excellent” level (22.4%; n = 37). When considered in each domain, it was found that most students had a “moving in the right direction” level toward students’ perception of teachers (62.4%; n = 103). For students’ perceptions of the atmosphere domain, most students had a “more positive attitudes” level (64.2%; n = 106), and for students’ social self-perception domain, most students had a “not too bad” level (64.2%; n = 106), as shown in Table 4.

Table 4 Percentage of perception in educational environment factors (n = 165)

Domain (Maximum score)	Scoring	n	%
Students' perception of teachers (44)	12 – 22 in need of some retraining	17	10.3
	23 – 33 moving in the right direction	103	62.4
	34 – 44 model course organizers	45	27.3
Students' perception of atmosphere (48)	0 – 12 terrible environments	3	1.8
	13 – 24 there are many issues which need changing	31	18.8
	25 – 36 more positive attitudes	106	64.2
	37 – 48 a good feeling overall	25	15.1
Student's social self – perception (36)	0 – 9 miserable	4	2.4
	10 – 18 not a nice place	22	13.3
	19 – 27 not too bad	106	64.2
	28 – 36 very good socially	33	20.0
Overall scoring for interpretation of educational environment (128)	0 – 32 Very poor	2	1.2
	33 – 64 Plenty of problems	11	6.7
	65 – 96 More positive than negative	115	69.7
	97 – 128 Excellent	37	22.4

Considering the difference of perception in educational environmental factors among dental public health students, perception of teachers had a statistically significant difference between colleges ($H = 19.342$, $p = 0.001$)., as shown in Table 5. Post-hoc pairwise comparisons revealed that students' perception of teachers differed significantly between College C and College D ($p = 0.011$), and between College C and College B ($p = 0.001$).

Table 5 Difference of students' perception mean between colleges

Domain (Maximum score)	Min	Max	Mean (SD)	<i>H</i>	<i>p</i>
Students' perception of teachers (44)	12.00	44.00	30.21(0.47)	19.342	0.001*
Students' perception of atmosphere (48)	12.00	48.00	29.58 (0.52)	5.309	0.257
Student's social self – perception (36)	4.00	36.00	22.94(0.43)	6.085	0.193
Overall scoring for interpretation of educational environment (128)	28.00	122.00	82.73 (1.25)	7.439	0.114

Notes : SD = standard deviation, Min = Minimum, Max = Maximum, *H* = Kruskal-Wallis Tests , * = correlation is significant at 0.01 level (2 – tailed).

Discussion

The study of dental public health students in their final year across the country shows significant differences between institutions in their clinical experiences, attitudes, and educational environments. Although students mostly performed preventive and basic restorative procedures in accordance with their primary responsibilities⁽⁵⁾, the reported zero minimum experience for essential tasks like scaling and simple extractions is concerning. This deficit may compromise graduates' confidence and clinical care quality. Kolb's Experiential Learning Theory states that consistent practice is crucial for converting theoretical knowledge into persistent clinical proficiency⁽²³⁾. The current accreditation standards at Sirindhorn College of Public Health (SCPH) provide a broad framework, but they lack specific clinical requirements. This could potentially contribute to the observed differences. It is essential to enhance these standards by incorporating evidence-based competency benchmarks. In contrast to Thai Doctor of Dental Surgery programs regulated by a particular dental council⁽³⁾, this curriculum lacks a unified minimum requirement. Implementing a competency-based model, with required minimum clinical standards across all campuses, would help ensure consistent training quality^(6,7). Institutions should also require students failing to meet these practices to re-register for an additional academic year.

Students displayed a moderate overall attitude toward dental practice. High scores in toothbrushing instruction and sealant moisture control reflect a preventive focus, consistent with the study that found Thai dental public health officers had high competency in oral health prevention⁽²⁴⁾. Conversely, lower attitude scores regarding the use of composite over amalgam reflected apprehension toward complex restorative procedures, probably resulting from insufficient clinical exposure. This corresponds with Bandura's Self-Efficacy Theory, which states

that direct mastery experiences fundamentally influence students' clinical confidence and attitudes⁽²⁵⁾.

Most students perceived a "more positive than negative" educational environment. This outcome, similar to those observed among health care students in many institutes⁽²⁶⁻³¹⁾, demonstrates a strong "Sense of Coherence" (SOC) that facilitates the management of clinical stresses. Nonetheless, significant inter-college disparity in "perception of teachers" reveals insufficient clinician monitoring. This aligns with the results of dental and medical students in Hungary but contrasts with a Syrian dental study where teacher perception was uniform⁽³¹⁾. Variations in clinical experiences are further driven by geographic and institutional factors. Students in big cities may get more patients for practice. Additionally, the generation of teachers influences dental practices; younger instructors tend to favor phasing out amalgam⁽³²⁾, which aligns with the guidelines set by the WHO⁽³³⁾ and the Minamata Convention⁽³⁴⁾. Furthermore, a significant amount of rubber dam application procedures at College D—initially implemented as a preventative strategy for COVID-19 aerosol control⁽³⁵⁻³⁷⁾—necessitates reassessment in the endemic phase to ensure practical, community-oriented training.

Internationally, the Thai dental public health curriculum aligns with the preventive focus of the dental hygienist program in other countries but lacks exacting, standardized clinical requirements, unlike dental hygiene education programs certified by CODA (US)⁽³⁸⁾ or the Australian Dental Council⁽³⁹⁾. Furthermore, while dental hygienists in these countries can work in private sectors under supervision by dentists, Thai dental public health officers are primarily limited to government settings. Such differences in professional mobility may be attributed to the rigorous and standardized educational systems, which ensure consistent clinical competency across both public and private sectors.

Limitations

The study's limitations included potential participant fatigue due to the lengthy questionnaire, the cross-sectional design that restricts causal inferences, and the inability to differentiate between on-time and extended students. Consequently, future research should utilize the standard, unmodified DREEM questionnaire to allow for systematic comparison against national and international institutions, supplemented by qualitative methods to explore resource and patient management insights. From a policy perspective, national standardization of minimum clinical requirements is crucial for uniform graduate competency. Curricula should emphasize resin composite or glass ionomer cement instead of amalgam; pandemic-related requirements

such as the routine rubber dam application need to be reevaluated. Finally, conducting faculty training programs is essential for enhancing clinical skills and minimizing instructional disparities across institutions.

Conclusion

Thai dental public health students demonstrate competency in most dental procedures but show significant inter-college variations in clinical experiences, attitudes, and teacher perception, indicating need for curriculum standardization.

Ethical Approval Statement

This research is a part of the project “Factors related to readiness for practice of oral health prevention and treatment among final-year dental public health students of Sirindhorn College of Public Health.” Ethical approval was granted by the human research ethics committee of Sirindhorn College of Public Health, Ubon Ratchathani (approval number SCPHUB S027/2567) on 1st October, 2024.

Author Contributions

NP and WO conceptualized the research topic. Research methodologies were designed by NP and WO. The survey was collected by PS and SJ under the coordination of NP. The results were analyzed by all researchers. Manuscript writing by NP and then revised by WO. All authors read and approved the manuscript prior to submission for publication.

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Conflicts of Interest

The authors have no conflicts of interest to declare.

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