



A Study on Dental Health Behavior of Nursing Students in Western University

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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ABSTRACT

Aims: The aim of this study was to assess the knowledge, attitude and practice of oral health among undergraduate Thai nursing students in Western University in Faculty of Nursing at Kanchanaburi, Thailand.

Study Design: Observational cross-sectional study.

Place and Duration of Study: Sample: Faculty of Nursing at Kanchanaburi, Western University, Thailand, between August 2014 and June 2015.

Methodology: Sample: A pilot study was conducted among 20 students, and the sample size was calculated as 135 participants. Total samples were taken from the year I to IV (7 men, 128 women; age range 18-23 years). The participants were asked different questionnaire on dental health knowledge, attitude and practice. Descriptive statistics were calculated for mean, standard deviation (SD), percentage (%). The data were analyzed using SPSS 18.

Results: The results show that 94.8 percent were female and only 5.2 were male. The dental problems were found in 94.07% of the participants, which includes dental plaque in 35.43%, followed by food impaction in 21.26%. The results of knowledge of oral health of the participants were, good knowledge in 51.11%. The results of the attitude on the oral health show more than

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60% had good attitude, but only 40% had low attitude and did not agree on the attitude questions that were asked. Regarding on the practice of oral health of the participants, over 80.74% of the participants had good practice such as brush their teeth twice daily by modified bass technique for 2-3 minutes and they use cream mixed fluoride toothpaste. About 37% of the participants visit the dentist twice per year for an oral health checkup and about 82.96% of the participants like fruits which is good for the oral health. But 62.22% of the participants visit to the dentist when they have only oral health problems. About 17.03% use horizontal brush technique and 4.44% brush their teeth with cream not mixed fluoride.

Conclusion: The nursing undergraduate students have moderate oral health knowledge, attitude and practice. Thus, introducing the teaching and training of the essential components of oral health care in a nursing school is a prerequisite for good practice. This will empower nursing professional with basic oral health knowledge and promote oral health behaviors and hence to disseminate to the patients.

Keywords: Oral health; knowledge; attitude; practice; Thai; dental students.

1. INTRODUCTION

Oral health is an important part of general health and well-being. An oral health status of a population is usually determined by the presence or absence of dental caries and periodontal disease as well as the level of oral hygiene found in the population. The dental caries and periodontal disease are the most common oral disease of public health importance which are identified among the general population [1].

Oral diseases are unfavorable to the quality of life and can have an impact on self-confidence, eating ability, and health. They are associated with considerable pain, anxiety and impaired social functioning [2]. The maintenance of optimum oral health is dependent on dental visits and the efficacy of oral self-care, which includes the use of toothbrushes, dental floss and other inter-dental aids. Although oral health represents an important attribute of overall health and well-being, oral diseases remain the most prevalent problems in the society. Attitudes and practice on oral health signify the condition of the oral cavity. The behavior of oral health providers and their attitudes towards their oral health could affect their capacity to deliver oral health care and thus might affect the oral health of their patients. Oral health care providers should set an example for their patients by maintaining their good oral health.

The good oral health, should no longer merely be seen as the absence of caries or periodontal disease; a patient's mental and social well-being should be considered as well. Based on this, it is the primary concern of dental professionals and oral health educators to impart a positive oral health knowledge and behavior in the society. It

will take a definite track only if there will be a presence of supportive environments, strengthening community action and development of personal skills. A plaque has been considered as an important factor for the dental caries and periodontal diseases. Brushing teeth twice daily with toothpaste containing fluoride and flossing helps to prevent and control the dental caries and periodontal diseases. In addition, a regular visit to the dentist helps to make good oral health [3,4].

Oral health in nursing students is studied in different countries [5-20]. Oral health knowledge, attitudes and behavior among 503 Jordanian nursing students have been improved [5]. It was found that more than half of the students brushed their teeth at least twice a day (61%) mainly after meals (37.6%) and half of them spent more than a minute brushing fluoridated toothpaste and vertical brushing technique are the most preferred where as hard bristles toothbrushes are the least preferred ones. 12.4% of the students kept their tooth brushes for more than 6 months, having bright teeth and no time for brushing found to be the leading causes for the students to brush or not to brush respectively. Only 12.9% of the students never visited a dentist till the day of questionnaire submission and 21.3% had their last visit 3 or more years. The majority of the students mentioned that they have the habit of drinking tea or coffee and even sweets once daily. The nursing students have a low oral health awareness. Another study done by Samadi et al. [6] in Jordanian nursing students found poor oral and dental health knowledge. Hence, more comprehensive courses on oral health care that teach and encourage the students to change their own dental health behavior and attitudes were needed.

Nursing personnel play a vital role in health promotion and preventive information dissemination, therefore it is very important that their own oral health knowledge is good and their oral health behavior conforms to the expectation of the community people [14]. Data on dental health care practices among undergraduate nursing students in Thailand is limited. Hence, the aim of this study, therefore, was to evaluate dental health knowledge, attitude and practices among nursing students at the Faculty of Nursing at Kanchanaburi, Western University, Thailand.

2. MATERIALS AND METHODS

2.1 Study Design

This observational cross-sectional study was conducted to evaluate dental health knowledge, attitude and practices among undergraduate nursing students at the Faculty of Nursing at Kanchanaburi, Western University, Thailand. The demographic data of the study is shown in Table 1.

2.2 Place and Duration of Study

This research study was conducted among nursing students at the Faculty of Nursing at Kanchanaburi, Western University, Thailand between August 2014 and June 2015 as shown in Table 1.

2.3 Study Sample

A pilot study was conducted on 20 students, and the sample size was calculated as 135 participants [21]. Total samples were taken from the year I to IV (7 men, 128 women; age range 18-23 years).

2.4 Data Collection

The nursing students were asked questionnaire on oral health knowledge, attitude and practice adapted from Muttineni et al. [14], Jain et al. [22], Abhishek et al. [23], and Al-Wahadni et al. [24]. Ethical permission for the research was obtained from the Faculty of Dentistry and Faculty of Nursing, Western University. In addition, informed consents were obtained from each participant at the beginning of the questionnaire, and students who only agreed to fill the questionnaire participated in the study. The questionnaire was distributed among the nursing students by one researcher and three volunteers. A time of 20 minutes was allotted to each student to fill in the questionnaire. The different questionnaires on knowledge, attitude and practice are shown below in Tables 2 and 3.

2.5 Data Analysis

Data entry was done on Excel and later transferred to SPSS 18. Descriptive statistics were calculated for mean, standard deviation (SD), percentage (%). The data were analyzed using SPSS 18.

To check the reliability and validity of the study, 10 randomly selected participants were re-called 2 weeks after the completion of the research and given the same questionnaire. We found that only 4% differences from the previous questionnaire that they filled which was acceptable.

3. RESULTS

From the total subjects (135) studied, the results of the gender distribution were 94.8% female and only 5.2% male.

Table 1. Demographic data of the study

Study details	
Study subjects and site	Faculty of Nursing at Kanchanaburi, Western University, Thailand
Study period	August 2014 to June 2015
Total subjects	135
• Male	7 (5.2%)
• Female	128 (94.8%)
Mean age	18-23 years

Table 2. Questionnaires on knowledge and attitudes about oral health

Questions	Most agree	Very agree	Moderately agree	Less agree	Least agree
1. Brushing teeth can help to prevent tooth decay					
2. Good or bad teeth depend on heredity					
3. Primary teeth don't affect with permanent teeth					
4. Everyone should know about the development of teeth					
5. Tooth eruption is not necessary to concern					
6. Aging causes most crown fracture					
7. Eating dessert often causes tooth decay					
8. Good dental health leads to good physical health					
9. People who understand the importance of good teeth will care their teeth					
10. Fruits and vegetables help to keep teeth healthy					
11. Brushing teeth after meals can prevent tooth decay					
12. Cavities and gingivitis don't affect one's character					
13. Should visit the dentist every six months for good dental health					
14. Tooth decay is caused by insects					
15. Brushing teeth twice a day, morning and evening helps to promote dental health					
16. Should use a toothpick to remove food impaction					
17. Fluoride helps to prevent tooth decay					
18. Oral diseases such as tooth decay, gum disease may spread to another organ					
19. Frequent dental visit makes tired					
20. When scurvy comes, you should buy medicine by yourself					

The results of the frequency, percentage and mean age of different grades are shown in Table 4. It showed that were approximate uniform distribution of the frequency of students in different years. Then mean ages in different grades increased from 18.86 in grade 1 to 22.71 in year IV.

The results of the medical and dental problems of the participants are shown in Table 5. Regarding medical problems, 128 (94.81%) were healthy and only 7 (5.18%) had the disease. Among the participants who had medical

problems; 1 (14.28%) had Thalassemia trait and 6 (85.71%) had other diseases. Regarding dental problems, only 8 (5.92%) were healthy, whereas 127 (94.07%) had problems/ disease. Among the participants who had oral health problems; 27 (21.26%) had food impaction, 15 (11.81%) had halitosis, 5 (3.94%) had difficulty in eating hard food, 17 (13.38%) had black spot or cavity, 16 (12.59%) had sensitivity or toothache, 45 (35.43%) had dental plaque, no one had bleeding gums and 1 (0.78) tooth mobility and other oral health problems/ diseases.

Table 3. Questionnaires on practice of oral health of the participants

Practice on oral health questions	Response
How do you clean your teeth?	Brush Rinse Other
When you clean your mouth	Wake up Wake up and before bedtime Wake up, after meal & before bedtime Other
How often do you clean your teeth?	Some day 1 time per day More than 1 time per day
How do you brush your teeth?	Horizontal brush technique Vertical brush technique Modify bass technique
What kind of toothpaste do you use?	Cream mixed fluoride Cream not mixed fluoride Powder toothpaste
How you select your brush?	Stiff hair Middle soft hair Soft hair
How long do you brush your teeth each time?	Less than 1 minute Approximately 1 minute Approximately 2-3 minutes
When you have, problems in the mouth, such as toothache, bleeding gums, how do you treat?	Buy drug and take Not do anything Visit the dentist
If you tooth pain or tooth scurvy, do you go to the dentist for dental examination?	Go Not go
How often you visit the dentist for a dental check-up?	Visit 1 time in 2 years Visit 1 time for 1 year Visit 2 or more than 2 times per year Visit when have problems Never visited for check-up
How often do you check your mouth by yourself?	1 time per week Some time Never checked
How many tooth decays you have now?	No Yes
Do you have inflammation of the gums, swollen or bleeding gums?	No Yes
What kind of food you like the most?	Fruit Dessert Biscuits Potato Chocolate toffee
Do you use cutting teeth (incisors) to bite hard food or bite some object?	Yes Never

Table 6 shows the results on attitude about oral health of the participants (frequency and percentage). The majority of the participants agrees from moderate to most (>60%) on the attitude questions about oral health. These

results may be as a result of good knowledge about the oral health. There are some participants (<40%) who don't agree on the attitude questions asked.

Table 4. Number, percentage and mean age in different grades

Year	Frequency	Percentage (%)	Mean age \pm SD
I	37	27.4	18.86 \pm 0.75
II	37	27.4	20.84 \pm 2.94
III	30	22.2	21.84 \pm 1.52
IV	31	23	22.71 \pm 1.13
Total	135	100	20.88 \pm 2.29

Table 5. Medical and oral health status of the participants

Health status	Frequency	Percentage (%)
Medical status		
A. Healthy	128	94.81
B. With disease	7	5.18
1. Thalassemia trait	1	14.28
2. Other diseases	6	85.71
Oral health status		
A. Healthy	8	5.92
B. Problem/ diseases	127	94.07
1. Food impaction	27	21.26
2. Halitosis	15	11.81
3. Difficulty in chewing hard food	5	3.94
4. Black spot or Cavity	17	13.38
5. Sensitive or Toothache	16	12.59
6. Dental plaque	45	35.43
7. Bleeding gums	0	0
8. Tooth mobility	1	0.78
9. Others	1	0.78

Based on the information given by the patients, knowledge was classified were very good, good, fair and poor. Table 7 shows the results of knowledge about oral health of the participants. 21 (15.55%) had very good knowledge, 53 (39.25%) had good knowledge, 26 (19.25%) had fair knowledge and 35 (25.92%) had poor knowledge.

Tables 8a and 8b shows the results of practice on oral health of the participants. Majority of the participants brush their teeth twice daily (after wake up and before bedtime) by modified bass technique for 2-3 minutes. In addition, they use cream mixed fluoride toothpaste. When they have problem on oral health, 62.22% of the participants visit to the dentist. About 37% of the participants visit dentist twice per year for oral health check-up. Among the participants 34.07% have dental caries, whereas, only about 7.40% have gum problems. About 82.96% of the participants like fruits which is good for oral health.

4. DISCUSSION

The mouth is the mirror image of general health; poor oral conditions may adversely affect the general health; similarly, certain medical

conditions may affect oral health. The level of oral health knowledge, attitude, and behaviors are interlinked and are positively associated with the level of education. [3,5,8] Nursing is an important paramedical course which as an essential supplementary field in medicine. Nurses play a vital role in the public to improve the awareness about general and oral health. These studies have found the level of education of the participants plays a vital role in oral health knowledge, attitude, and behaviors; as an educated individual gain the requisite knowledge from various sources [14,15]. These will finally drive public to have a positive dental health attitude and behavior

Our study is comparable to a study done on oral health knowledge, attitudes and behavior in Jordanian nursing students [5] found that more than half of the students brushed their teeth at least twice a day (61%) mainly after meals (37.6%) and half of them spent more than a minute brushing fluoridated toothpaste and vertical brushing technique are the most preferred where as hard bristles toothbrushes are the least preferred ones. This result was also similar to another study done by Smadi et al. [6] where they also found poor knowledge of the oral health in nursing students. But in our study,

92.59% brush more than 1 time per day and 51.11% brush after wake up and before bedtime, whereas, 44.44% brush after wake up, after meal and before bedtime. Most participants (91.11%) used cream mixed fluoride. Regarding brushing technique, 17.03% brush in horizontal direction, 31.11% brush in vertical direction and 51.85%

brush using the Modified Bass technique. In addition, in our study, 69.62% of the participants use a medium soft toothbrush and 62.22% brush approximately for 2-3 minutes. Hence, the participants showed better oral health knowledge and practice than Jordanian nursing students.

Table 6. Knowledge and attitude about oral health of the participants

Attitude questions	Most agree		Very agree		Moderately agree		Less agree		Least agree	
	n	%	n	%	n	%	n	%	n	%
Brushing teeth can help prevent tooth decay	80	59.3	50	37	4	3	1	0.7	0	0
Good or bad teeth depend on heredity	13	9.6	35	25.9	41	30.4	16	11.9	30	22.2
Primary teeth don't affect permanent teeth	9	6.7	28	20.7	35	25.9	32	23.7	31	23
Everyone should know about the development of teeth	55	40.7	62	45.9	14	10.4	4	3	0	0
Teeth eruption is not necessary to concern	19	14.1	44	32.6	10	7.4	22	16.3	40	29.6
Aging causes crown fracture	29	21.5	55	40.7	37	27.4	11	8.1	3	2.2
Eating dessert often causes tooth decay	60	44.4	56	41.5	18	13.3	0	0	1	0.7
Good dental health leads to good physical health	64	47.4	50	37.0	17	12.6	2	1.5	1	0.7
People who understand the importance of good teeth will care their teeth	71	52.6	53	39.3	9	6.7	1	0.7	1	0.7
Fruits and vegetables help to keep teeth healthy	64	47.4	59	43.7	10	7.4	1	0.7	1	0.7
Brushing teeth after meals can prevent tooth decay	67	49.6	53	39.3	10	7.4	4	3	1	0.7
Cavities and gingivitis does not affect one's character	21	15.6	43	31.9	16	11.9	19	14.1	36	26.7
Should visit the dentist every 6 month for good dental health	65	48.1	57	42.2	13	9.6	0	0	0	0
Tooth decay is caused by insects	30	22.2	52	38.5	34	25.2	11	8.1	8	5.9
Brushing teeth twice a day, morning and evening helps to promote dental health	61	45.2	55	40.7	16	11.9	2	1.5	1	0.7
Should use a toothpick to remove food impaction	18	13.3	31	23.0	33	24.4	30	22.2	23	17.0
Fluoride helps to prevent tooth decay	71	52.6	50	37.0	13	9.6	1	0.7	0	0
Oral diseases such as tooth decay, gum disease may spread to another organ	62	45.9	53	39.3	17	12.6	2	1.5	1	0.7
Frequent visiting dentist makes tired	16	11.9	36	26.7	30	22.2	25	18.5	28	20.7
When scurvy comes, you should buy medicine yourself	11	8.1	32	23.7	34	25.2	29	21.5	29	21.5

*n=frequency, %=percentage

Table 7. Knowledge about oral health of the participants

Result	Frequency (n)	Percentage (%)
Very good	21	15.55%
Good	53	39.25%
Fair	26	19.25%
Poor	35	25.92%

Table 8a. Practice on oral health of the participants

Practice on oral health questions	Response	Frequency (n)	Percentage (%)
How do you clean your teeth?	Brush	109	80.74%
	Rinse	26	19.25%
	Other	0	0%
When you clean your mouth	Wake up	6	4.44%
	Wake up and before bedtime	69	51.11%
	Wake up, after meal & before bedtime	60	44.44%
	Other	0	0%
How often do you clean your teeth?	Some day	1	0.74%
	1 time per day	9	6.66%
	More than 1 time per day	125	92.59%
How do you brush your teeth?	Horizontal brush technique	23	17.03%
	Vertical brush technique	42	31.11%
	Modify bass technique	70	51.85%
What kind of your toothpaste do you use?	Cream mixed fluoride	123	91.11%
	Cream not mixed fluoride	6	4.44%
	Powder toothpaste	6	4.44%
How you select your brush?	Stiff hair	9	6.66%
	Middle soft hair	94	69.62%
	Soft hair	32	23.70%
How long do you brush your teeth each time?	Less than 1 minute	3	2.22%
	Approximately 1 minute	48	35.55%
	Approximately 2-3 minutes	84	62.22%
When you have, problems in the mouth, such as toothache, bleeding gums, how do you treat?	Buy drug and take	24	17.77%
	Not do anything	20	14.81%
	Visit the dentist	91	67.40%
If you have pain or tooth scurvy, do you go to the dentist for dental examination?	Go	84	62.22%
	Not go	51	37.77%
How often you visit the dentist for a dental check-up?	Visit 1 time in 2 years	18	13.33%
	Visit 1 time for 1 year	30	22.22%
	Visit 2 or more than 2 times per year	50	37.03%
	Visit when have problems	31	22.96%
	Never visited for check-up	6	4.44%

Table 8b. Practice on oral health of the participants

Practice on oral health questions	Response	Frequency (n)	Percentage (%)
How often do you check your mouth by yourself?	Observed 1 time per week	70	51.85%
	Some time	64	47.40%
	Never observed	1	0.74%
How many tooth decays you have now?	No	89	65.92%
	Yes	46	34.07%
Do you have inflammation of the gums, swollen or bleeding gums?	No	125	92.59%
	Yes	10	7.40%
What kind of food you like the most?	Fruit	112	82.96%
	Dessert	10	7.4%
	Biscuits	9	6.66%
	Potato	2	1.4%
	Chocolate toffee	2	1.4%
Do you use cutting teeth (incisors) to bite hard food or bite some object?	Yes	54	40%
	Never	81	60%

In another study in Indian nursing students [7] on oral health knowledge, attitude and practice amongst nursing students which showed a majority of the respondents were practicing healthy oral hygiene practices that included brushing twice a day with a toothbrush and toothpaste for adequate duration of 2-3 minutes. These results were similar to our study where most participants brush more than once (92.59% of participants), use fluoridated toothpaste (91.11% of participants) and for 2-3 minutes (62.22% of participants). In their study, almost 87% of them were aware of the diseased gingival condition and almost half of the participants visited a dentist only when have pain. However, a majority of the participants gave importance to their teeth similarly as their general health. In our study, the results of dental visit were as, 13.33% visit one time in 2 years, 22.22% visit one time in 1 year, 37.03% visit equal or more than 2 times per year, 22.96% visit only to determine when have abnormalities only and 4.44% never go check-up. Similar to our study, it was seen that the knowledge, attitude and practice of nursing students about oral health was moderate to adequate but the improvement was encouraged. However, in a study in Turkish nursing students, it was found that they have low oral health awareness and more comprehensive courses on oral health care that teach and encourage the students to change their own dental health behavior and attitudes were needed [13].

Another study was done by Rwakatema et al. [8] to determine the prevalence of dental caries, oral hygiene practice. In addition, they assessed the

oral health knowledge and practices of nursing students at Kilimanjaro Christian Medical Centre teaching hospital in Moshi, Tanzania. They found that majority of the students had good oral hygiene and a very low dental caries index. But, there was poor basic oral health knowledge and poor recall visit to dental personnel. But in our study, the results of dental visit were as, 13.33% visit one time in 2 years, 22.22% visit one time in 1 year, 37.03% visit equal or more than 2 times per year. Hence the participants in our study showed moderate to adequate oral health knowledge, attitude and practice.

For the poor knowledge of oral health knowledge, curriculum development in these education programs should be strengthened or encompass comprehensive oral health education components. Oral health care awareness among nursing students has a strong impact on improving the student's competency in oral health knowledge and skills. Rabiei et al. [9] found that the primary care nurses' low level of knowledge in oral health care and their positive attitude and willingness to obtain more information, point to the need for appropriate oral health care training and encouragement from the nurses to promote oral health and prevent dental diseases. Sangappa et al. [10] found low oral health knowledge and practice in nursing students as similar to the study by Smadi et al. [6] and showed the impact of a course on oral health care awareness among third-year undergraduate nursing students where they used lectures, videos & live demonstrations on models and patients for oral health care. The results

indicated the improvement in the student's competency in oral health knowledge and skills after implementation of a course on oral health care. Hence, implementing the teaching and training of oral health care in a nursing school is essential to promote oral health and prevent dental diseases [24-26].

The limitation of this study is the uniformity of the male and female in this study as only 5.2% male participants were present. This result is the fact that most female study nursing than male. Further study may be done in larger sample size and more detail study.

5. CONCLUSION

Nurses play a vital role in the public to improve the awareness about general and oral health. The nursing undergraduate students have moderate oral health knowledge, attitude and practice. Thus, introducing the teaching and training of oral health care in a nursing school is a prerequisite for good practice. This will empower nursing professional with basic oral health knowledge and promote oral health behaviors and hence to disseminate to the patients.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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