



Oral health status, behaviors and oral health related quality of life among pupils in Border Patrol Police Schools, Thailand

Tippanart Vichayanrat¹, Piyada Gaewkhiew², Reda Kasetsuwan³, Hathairat Kaewsringam⁴, Komsun Lapauthaya³, Poonpon Khowiboonchai², Passiri Nisaluk⁵

¹ Department of Community Dentistry, Faculty of Dentistry, Mahidol University, Bangkok, Thailand

² Department of Community Dentistry, Faculty of Dentistry, Mahidol University, Bangkok, Thailand

³ Department of Community Dentistry, Faculty of Dentistry, Mahidol University, Bangkok, Thailand

⁴ H.R.H. Princess Maha Chakri Sirindhorn's Dental Mobile Service Center, Faculty of Dentistry, Mahidol University, Bangkok, Thailand

⁵ Department of Orthodontics, Faculty of Dentistry Mahidol University

Abstract

Objectives: To investigate the oral health status, oral health behaviors and impact of oral health on quality of life among pupils from Border Patrol Police Schools (BPPS) who participated in the Young Smile Ambassador Project (YSAP).

Methods: All pupils who attended the YSAP at the primary phase were assessed for oral health status including dental caries, oral hygiene status, dental fluorosis, and dental trauma. The face-to-face interviews were conducted to obtain the oral health-related behaviors and impact of oral health on daily performance among pupils. Data were analysed by descriptive analysis.

Results: A total of 369 pupils participated. The age ranged from 7 to 16 years old and most pupils were 11-12 years old (50.9%). Caries prevalence was 64.4% with mean DMFT of 2.17 among 11-12-year-old pupils. Oral hygiene was moderate among all age groups. Dental fluorosis was 11.6%, with mostly very mild level. Pupils aged 11-12 years brushed their teeth everyday in the morning at 75.3%, after lunch at school everyday at 51.0%, and brushing before bedtime everyday at 44.4%. More than 80% of pupils reported having cariogenic snacks and drinks some days during the past week. Most pupils had oral examination (93.5%) and dental treatment (82.9%), and mostly received dental services at schools (68.0%). Among all pupils, 70.2% reported experiencing tooth pain, while 40.4% ever missed their school due to toothache. Chewing problem, sleeping disturbance, esthetic concern, and unsatisfied with oral health were reported at 33.3%, 32.0%, 40.4%, and 17.6%, respectively.

Conclusion: Dental caries among these pupils were alarming high compared to the national survey and affected their quality of life. Future programs focusing on oral health prevention and promotion are very essential in order to promote healthy oral health and improve quality of life among BPPS pupils.

Keywords: pupils, oral health, quality of life, caries, border patrol police school

How to cite: Vichayanrat T, Gaewkhiew P, Kasetsuwan R, Kaewsringam H, Lapauthaya K, Khowiboonchai P, Nisaluk P. Oral health status, behaviors and oral health related quality of life among pupils in Border Patrol Police Schools, Thailand. *M Dent J* 2016; 36: 31-38.

Corresponding author:

Tippanart Vichayanrat
Department of Community Dentistry,
Faculty of Dentistry, Mahidol University,
6 Yothi Street, Rajithevi, Bangkok 10400,
Thailand

Tel: (+662) 200 7809-10

Fax: (+662) 200 7808

Email: tippanartv@hotmail.com

Received: 5 October 2015

Accepted: 23 February 2016

Introduction

Dental caries in school pupils is still a major public health problem in many countries, especially those from low-socioeconomic families¹⁻⁴. While many initiatives try to increase access of dental care to the poor and underprivileged population using dental mobile unit to providing the dental treatment, most were unsuccessful to promote a sustainable oral health outcome⁵. The key concept of health promotion is to enable people and changing their environment that conducive to health⁶. Thus the participation is very essential in order to promote long term healthy oral health.

In Thailand, The recent National Oral Health Survey revealed that 41.9% of 12-year-old pupils in rural area reported having dental pain, and 7% reported missing the school days due to dental pain during the past year⁷. While the caries prevalence decreased slowly among pupils in the city and urban areas, the situation was worse in rural areas especially those who lived at the border of the country. These marginalized pupils including hill tribe pupils mostly attend Border Patrol Police Schools (BPPS) where police officers function as teachers and also health educators. As the access to dental care was very limited in rural population, the oral health services were mostly provided through mobile dental units. In 1992, the Faculty of Dentistry at Mahidol University (MUFD) started the dental mobile services for school pupils and people living in remote areas⁸. Then six years later, the HRH Princess Sirindhorn Dental Mobile Project has initiated to provide the dental services to pupils in BBPS as part of HRH's child developmental program serving BPPS throughout the country.

As an auspicious occasion of HRH Princess Sirindhorn's 60th birthday in 2015, MUFD has initiated the "Young Smile Ambassador Project"

(YSAP) as a three-year project to promote oral health among pupils at BPPS in Thailand. This project aims to enabling pupils and teachers to improve oral health in remote areas located in 33 provinces at the borders of Thailand. The program was developed into three phases; 1.) initial assessment and increase awareness, 2.) program identification and implementation and 3.) program evaluation. At present the project has finished the first phase, which aimed to increase pupils' and teachers' awareness about oral health problem, increase their oral health knowledge and to assess the oral health status and situation among pupils and their schools. One teacher and two pupils from all BPS in Thailand were invited to join the 1st-phase program. A 3-day program was conducted with pupils and teachers from 191 Border Patrol schools. The activities included oral health education through walk rally and games organized by dental students and faculty members at Mahidol University. The program also incorporated the team building activities by The Art and Cultural Institute for Development (MAYA) which is the institute that specialized in child development and health promotion through arts and plays.

This study aimed to investigate the oral health status, oral health behaviors and oral health impact among pupils who participated in the Young Smile Ambassador Project. This information would be useful to set the priority and understand the oral health problem and situation among the pupils at the Border Patrol Schools in Thailand.

Materials and Methods

Study population

This cross-sectional study included all pupils who participated in YSAP and presented for the first phase of this project on the first day of activity. The pupils needed to study in BPPS at primary level, healthy, and could communicate by speaking and listening

Thai language. The pupils who were unable to cooperate during oral examination were excluded from this study.

Data collection

Oral examination procedures

Six calibrated examiners examined the pupils for the oral health status including dental caries using WHO criteria⁹, oral hygiene status using OHI-S, dental trauma, and dental fluorosis according to Dean's Dental Fluorosis Index⁹. The oral examinations were performed under the portable lamp and dental mobile units. The dental assistants filled the dental record using the modified 7th National Oral Health Survey Form⁷.

Questionnaire interview

A questionnaire was modified from the 7th National Oral Health Survey questionnaire to collect the demographic data, tooth brushing behavior, cariogenic snack consumption, the utilization of dental services and pupils oral

impacts on daily performance⁷. The questionnaire content was piloted prior to the program with twenty school pupils and revised until wording and sentences were appropriate for pupils. Twenty interviewers were trained to deliver each question to the pupils in the same manners. Each interview was conducted approximately 15 minutes for each student.

Data Analysis

Data were evaluated using descriptive analysis. Each variable was categorized and counted by frequency, percentage, and means with standard deviations.

Result

Demographic data

Among 369 pupils, 55.8% were female. The age ranged from 7 to 16 years old and most pupils were 11-12 years old (50.9%). Majority of pupils were Buddhist (80.5%) and studying at Grade 5 level (49.6%) (Table 1).

Table 1 Characteristics of pupils (N=369)

Characteristics	N	%
Gender		
Male	163	44.2
Female	206	55.8
Age		
7-10	138	37.4
11-12	188	50.9
13-16	53	14.4
Religion		
Bhudist	297	80.5
Muslim	30	8.1
Christian	35	9.5
Others	7	1.9
Education levels		
Grade 3	65	17.6
Grade 4	99	26.8
Grade 5	183	49.6
Others	13	3.5

Dental caries and oral hygiene status

The prevalence of dental caries was 64.4% among 11-12 years old pupils, and increased to 74.4% among older pupils. The mean DMFT was 2.17 among 11-12 years old pupils, and increased to 2.79 in older pupils. Oral hygiene was moderate among all age groups, with increasing calculus in older pupils (Table 2).

Dental fluorosis and dental trauma

Forty-three pupils (11.6%) had dental fluorosis. Among all 43 cases of dental fluorosis, the majority of dental fluorosis was

found in the pupil from the northern region (15 pupils), followed by the southern region (10 pupils). Dental trauma was 1.9% and all cases were affected on central incisors (Table 3).

Tooth brushing behavior

Most pupils aged 11-12 years reported brushing their teeth every day in the morning (75.34%), while 44.4% reporting brushing before bedtime. Most pupils aged 13-16 years brush their teeth in the morning everyday (67.4%), while 53.5% brushing before bedtime everyday (Table 4).

Table 2 Dental caries and oral hygiene status

Age (years)	N	Caries Prevalence (%)	Mean (S.D.)				
			Untreated Decay	DMFT	DI-S	CI-S	OHI-S
7 - 10	138	64.5	0.86 (1.37)	1.51 (1.68)	1.79 (0.70)	0.85 (0.60)	2.65 (1.11)
11 - 12	188	64.4	1.30 (1.93)	2.17 (2.43)	1.78 (0.57)	0.86 (0.54)	2.65 (0.98)
13 - 16	43	74.4	1.33 (2.00)	2.79 (2.82)	1.67 (0.60)	1.64 (0.51)	2.71 (0.96)

Note : DMFT = the sum of decayed, missing and filled permanent teeth, OHI-S = Simplified Oral Hygiene Index, DI-S = Simplified Debris Index, CI-S = Simplified Calculus Index

Table 3 Dental fluorosis and dental trauma

Dental Status	N	%
Fluorosis		
No	326	88.4
Yes	43	11.6
Questionable	2	0.5
Very mild	19	5.1
Mild	13	3.5
History of Dental trauma		
Yes	7	1.9
No	362	98.1

Table 4 Frequency of tooth brushing in the morning and bedtime

Age	n	Morning, n (%)			Before bedtime, n (%)		
		No	Sometimes	Everyday	No	Sometimes	Everyday
7 -10	138	2 (1.4)	26 (18.8)	110 (79.7)	19 (14.1)	49 (36.5)	67 (49.6)
11 -12	188	1 (0.5)	48 (25.5)	139 (73.9)	15 (8.0)	89 (47.6)	83 (44.4)
13 -16	43	0 (0.0)	14 (32.6)	29 (67.4)	6 (14.0)	14 (32.6)	23 (53.5)

Pupils aged 7-10, 11-12, and 13-16 years reported brushing after lunch everyday at 46%, 36.7%, and 44.2%, respectively. Student reported that teacher supervised them during their brushing after lunch at 38.5%, 49.5%, and 41.9% among 7-10, 11-12, and 13-16 years old pupils, respectively. Almost all pupils (96.8-98.6%) used toothpastes (Table 5).

Cariogenic snacks and drinks

Most pupils reported drinking soft drink

or sweeten drink/juice somedays in the past week. Overall most pupils reported drinking soft drink or sweeten drink/juice at home, than at school (Table 6).

Most pupils reported having candies somedays during the past week. Overall most pupils reported having crispy snack and candies most frequent at home, than at school (Table 7). The pocket money that pupils received daily was ranged from 0 to 50 baht, among all age groups.

Table 5 Frequency of toothbrushing after lunch at school, teacher supervision, and toothpaste use

Age	n	After lunch, n (%)			Teacher Supervision n (%)	Toothpaste Use n (%)
		No	Sometimes	Everyday		
7 -10	138	5 (5.8)	51 (37.0)	79 (57.2)	52 (38.5)	136 (98.6)
11 -12	188	12 (6.5)	79 (42.5)	95 (51.0)	93 (49.5)	182 (96.8)
13 -16	43	5 (11.6)	16 (37.2)	22 (51.2)	18 (41.9)	42 (97.9)

Table 6 Consumption of cariogenic drinks during the week, and the most frequent place that they consumed (N=369)

Age	Soft drink					Sweeten drink /Juice				
	Frequency n (%)			Home (%)	School (%)	Frequency n (%)			Home (%)	School (%)
	Never	Someday	Everyday			Never	Someday	Everyday		
7 - 10	18 (13.0)	111 (84.4)	9 (6.5)	60.1	22.5	16 (11.6)	108 (78.3)	14 (10.1)	52.9	31.2
11-12	17 (9.0)	163 (86.7)	8 (4.3)	55.9	35.1	26 (13.8)	153 (81.4)	9 (4.8)	50.5	34.0
13-16	6 (14.0)	36 (83.7)	1 (2.3)	48.8	37.2	5 (11.6)	35 (81.4)	3 (7.0)	44.2	39.5

Table 7 Consumption of cariogenic snacks during the week, and the most frequent place that they consumed (N=369)

Age	Crispy snack					Candy				
	Frequency n (%)			Home (%)	School (%)	Frequency n (%)			Home (%)	School (%)
	Never	Someday	Everyday			Never	Someday	Everyday		
7-10	5 (3.6)	84 (60.9)	49 (35.5)	48.6	37.7	15 (10.9)	110 (79.7)	13 (9.4)	58.7	26.1
11-12	4 (2.1)	108 (57.4)	76 (40.4)	46.3	43.1	15 (8.0)	151 (80.3)	22 (11.7)	53.7	34.0
13-16	2 (4.7)	35 (81.4)	6 (14.0)	51.2	39.5	1 (2.3)	37 (86.0)	5 (11.6)	44.2	44.2

Oral health service utilization

Most pupils had ever received oral examination (93.5%) and dental treatment (82.9%). Schools were common place that pupils received dental services (68.0%). The frequency of dental visit were “rarely” (45.3%), “6-12 months” (32.2%), “when having symptoms” (17.1%) and “never” (5.4%), respectively (Table 8).

Oral health impact on daily performance

Among all pupils, 70.2% reported experiencing tooth pain, while 40.4% of pupils had ever missed their school due to toothache. Their daily routine activities such as chewing

food and sleeping were affected by oral health problems at 33.3% and 32.0%, respectively. For esthetic concern, 40.4% of pupils worried about their smiles and appearance. Overall, 17.6% of pupils were unsatisfied with their oral health status. The oral health impacts on daily performance divided by age groups show in Table 9.

Discussion

All study pupils recruited from all regional BPPS of Thailand. Even though having dental mobile services for 16 years, the dental problems are still very high. Dental caries were more prevalent and profound than

Table 8 Utilization of oral health services

Oral health services	N	%
Oral examination		
Yes	345	93.5
No	24	6.5
Oral health treatment		
Yes	306	82.9
No	63	17.1
Location/facilities		
School	208	68.0
Health center/government hospital	85	27.8
Clinic / private hospital	13	4.3
Frequency of receiving oral health services		
Never	20	5.4
When having pain/symptom	63	17.1
Every 6-12 months	119	32.2
More than a year/rarely	167	45.3

Table 9 Oral health impact on daily performance

Age	N	Oral health impact on daily performance					
		n (%)					
		Toothpain	School-off due to toothache	Chewing problem	Esthetic concern	Sleep disturbance	Unsatisfied with oral health status
7 -10	138	94 (68.1)	21 (15.2)	48 (35.3)	47 (34.8)	49 (35.5)	23 (16.7)
11 - 12	188	134 (71.3)	19 (10.1)	62 (33.3)	86 (46.0)	56 (30.1)	34 (18.1)
13 - 16	43	32 (74.4)	4 (9.3)	13 (30.2)	16 (38.1)	13 (30.2)	8 (18.6)
Total	369	259 (70.2)	44 (11.9)	123 (33.3)	149 (40.4)	118 (32.0)	65 (17.6)

the pupils in the 7th National Oral Health Survey⁷. The caries experiences were 64.4% among 11-to-12-year-old pupils, compared to 52.3% among 12-year-old pupils from the National Oral Health Survey⁷. Caries severity was 2.17 teeth per person, compared to 1.3 teeth per person at national level⁷. The prevalence increased to 74.6% in 15-year-old pupils compared to 62.4% from the national report⁷. However, the prevalence of dental fluorosis was the same as the national level.

The reports of brushing daily in the morning and nighttime among BPPS pupils were lower than national report⁷. Only 73.9% and 44.4% of pupils reported brushing daily at morning and nighttime, respectively, compared to 91% and 48% of those reported from the rural area at national survey. However, the reports of brushing after lunch were much higher in this study. From the national survey⁷, 24% of 12-year-old pupils in rural area reported brushing after lunch, compared to 51.1% of BPPS pupils in this study. This may indicate that the brushing after lunch in the school program was more rigorous in BPPS than the other schools. However, 49% of pupils in BPPS reported that teachers supervised them during tooth brushing at schools.

The oral hygiene status has shown that dental plaque and calculus was moderate among these pupils, and tended to increase with age. Since the brushing after lunch seems to be a routine habit among most of these pupils, the effective tooth brushing with fluoride toothpaste should be emphasized as an important mean to prevent dental caries.

More than 80% of pupils in this study consumed cariogenic drinks and snacks sometimes or everyday in the past week, but lower percentage than the National Survey⁷. However, the consumptions of crispy snacks (40%) and candy (11%) everyday were the same.

The findings also indicated that pupils had these cariogenic snacks and drinks at their homes more than schools. It may imply that parents were more likely to have cariogenic snacks available at home. While the oral health services and promotion activities mostly deliver at school, the oral health promotion program should involve parents and caregivers to maximize the effectiveness of the program¹⁰. Although having cariogenic snacks and drinks at school was low, it still needs to reinforce the school policy of no soft drinks and low sugar snacks¹¹. The future program at BPPS may need to increase awareness and engage teachers at school to promote healthy school environment through school health promotion program that target not only the oral health, but also promoting general health as well^{12, 13}.

The percentage of BPPS pupils who had oral examination and dental treatment were higher than those reported from national survey. The dental services were mostly received at schools, while the national survey showed that most pupils in rural areas received dental services at government hospitals or health centers⁷. It emphasized the importance of the dental mobile service provided to BPPS pupils because it was more reliable and increase dental access.

The oral health impact on daily performance is high as previously reported¹⁴. Seventy percents of pupils aged 11-12 years old had dental pain, compared to the report of 42% in rural area pupils from national survey⁷. School-off due to toothache were higher than the rural area data of the national survey⁷. This indicated many activities were affected pupils's quality of life such as chewing food, sleeping problem, and esthetic concern. Many studies demonstrated that untreated decayed teeth are significant associated with well-being of pupils¹⁴⁻¹⁶. Therefore, the health promotion and prevention

program for the pupils in BPPS of Thailand are still needed to promote healthy oral health and improve quality of life among these pupils.

Funding : Mahidol University, Faculty of Dentistry

Conflict of interest: None

Ethical approval: COE No. MU-DT/PY-IRB 2015/014.1006

Acknowledgements

The authors would like to express sincere gratitude to all pupils and teachers who participated in this project. We appreciate the support and coordination from the staff at the H.R.H Princess Maha Chakri Sirindhorn's Dental Mobile Service Center. We are very thankful for the staff at Research Office who facilitated all training and data collection. We are also grateful for Professor Sroisiri Thaweeboon, Associate Professor Siriruk Nakornchai, Assistant Professor Panit Banditsing, and all faculty members at Faculty of Dentistry, Mahidol University, who provided valuable suggestions and supports during the project.

References

1. Kumar S, Kroon J, Laloo R. A systematic review of the impact of parental socio-economic status and home environment characteristics on pupils's oral health related quality of life. *Health Qual Life Outcomes* 2014; 12: 41.
2. Angelopoulou M, Kavvadia K, Oulis C, Reppa C. Oral Hygiene Facilitators and Barriers in Greek 10 Years Old Schoolpupils. *Int J Clin Pediatr Dent* 2015; 8(2): 87-93.
3. Schwendicke F, Dorfer CE, Schlattmann P, Page LF, Thomson WM, Paris S. Socioeconomic inequality and caries: a systematic review and meta-analysis. *J Dent Res* 2015; 94(1): 10-8.
4. Krisdapong S, Prasertsom P, Rattananangsim K, Sheiham A. Sociodemographic differences in oral health-related quality of life related to dental caries in Thai school pupils. *Community Dent Health* 2013; 30(2): 112-8.
5. Vashishtha V, Kote S, Basavaraj P, Singla A, Pandita V, Malhi RK. Reach the unreached - a systematic review on mobile dental units. *J Clin Diagn Res* 2014; 8(8): ZE05-8.
6. Nutbeam D, Kickbusch I. Health promotion glossary. *Health Promot Int* 1998; 13(4): 349-64.
7. Bureau of Dental Health. The 7th National Oral Health Survey 2012. Available from: <http://dental.anamai.moph.go.th/survey7.pdf>. online 11 November 2013
8. Dentistry Fo. H.R.H Princess Maha Chakri Sirindhorn Mobile Dental Unit Center Bangkok, Thailand: Mahidol University Faculty of Dentistry. 2014 [cited 28 Sept 2015 Available from: http://www.dt.mahidol.ac.th/division/th_H.R.H.Princess_Maha_Chakri_Sirindhorn_Mobile_Dental_Service_Center/.
9. WHO. *Oral health surveys. Basic Methods*. 4th ed. Geneva: WHO; 1997.
10. Pithpornchaiyakul S, Eungpoonsawat W, Chukhadee W, Youngstar P, Arkasuwan N. Oral Health Promotion Program in the Border Patrol Police Schools in Songkhla Province. *J Dent Assoc Thai* 2010; 60(1): 22-31.
11. Arunpraphan S, Prasertsom P, Kaewkhuntee D, Jirapongsa W, Rattananangsim K. Situation of health promotion in primary school. *Thai J Dent Public Health* 2007; 12(1): 50-60.
12. Glick M, Monteiro da Silva O, Seeberger GK, Xu T, Pucca G, Williams DM, et al. FDI Vision 2020: shaping the future of oral health. *Int Dent J* 2012; 62(6): 278-91.
13. World Health Organization. Global action plan for the prevention and control of noncommunicable disease. Geneva, Switzerland: World Health Organization, 2013.
14. Krisdapong S, Prasertsom P, Rattananangsim K, Sheiham A. Associations between perceived needs for dental treatment, oral health-related quality of life and oral diseases in school-aged Thai pupils. *Community Dent Oral Epidemiol* 2014; 42(4): 323-32.
15. Krisdapong S, Prasertsom P, Rattananangsim K, Sheiham A. School absence due to toothache associated with sociodemographic factors, dental caries status, and oral health-related quality of life in 12- and 15-year-old Thai pupils. *J Public Health Dent* 2013; 73(4): 321-8.
16. Krisdapong S, Sheiham A. Which aspects of an oral health-related quality of life measure are mainly associated with global ratings of oral health in pupils? *Community Dent Oral Epidemiol* 2014; 42(2): 129-38.