Study of the Dental Survey of Laos Children in Champasak Province, 2019

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Objective: The goal of this study is to determine the degree of dental caries experience of children in Champasak Province.

Methods: The authors analyze the oral examination results of 100 primary school, 99 junior high school, and 100 high school students.

Results: The decayed-filled primary teeth index (dft index) of 6-year-old primary school children was 5.30 and their primary tooth dental caries experience rate (df rate) was 88.00%. The decayed-filled-missing permanent teeth index (DMFT index) of 12-year-old middle school children was 0.75 and their permanent tooth dental caries experience rate (DMF rate) was 35.35%. The DMFT index of 15-year-old middle school children was 2.20 and their DMF rate was 64.00%.

Conclusion: For the growth of qualitative dental care, the manpower required to meet the needs of people must be assessed and efforts must be made to produce them through appropriate medical education.

Keywords: Champasak Province, dental survey, Laos children

Introduction

According to the World Health Organization, it was defined as “health is a state of complete physical, mental, and social

well-being and not merely the absence of disease or infirmity.” [1-4]. In other words, health is not just lack of suffering from disease or weakness, but being well in body, mind, and social life [1-4]. In dental care, self-help is the act of trying to preserve one’s oral health and in particular not shortening tooth life [1-4]. Oral health is a factor affecting the quality of one’s social life. A major oral disease hindering oral health is dental caries [1-4].

In Laos, the dental delivery system is mainly managed by the communist government, but during evening hours, although not in a big way, it changes to a private dental system. According to market theory, the basic oral diseases due to dental caries or periodontal issues occur predominantly owing to

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the lack of public oral health programs [5,6].

In Korea, school oral health departments focus mainly on the prevention of caries and other oral injuries for primary school students. In this regard, they have introduced tooth brushing, fluoride mouthwash gargling, and pit and fissure sealant programs [1-4].

In Laos, the government implemented a project for supplying fluoride-containing salt as an oral health program and a simplified and modified atraumatic restoration treatment (SMART) project. The SMART project is based on the Non-traumatic Caries Removal Prevention and Charging Act, and involves the removal of caries using water devices, not electric devices, and replacing them with glass ionomer cement [7-11].

Accordingly, the author intends to conduct a survey of the dental caries experience of children in Champasak Province and the actual condition of students' oral health. This study can be used as basic data for implementing the Lao government's public oral health project.

Materials and Methods

1. Subject

This study targets 6-year-old primary, 12-year-old middle, and 15-year-old high school children in Champasak Province, Laos, following recommendations of the Lao Dental Association and Lao Office of Education to study school students (Table 1).

2. Methods

1) Composition of investigation team

The research team consisted of thirteen persons, including seven Korean dentists, three Lao dentists, one examination assistant, and two administrative staff. The survey criteria of the survey teams were merged just before the survey.

2) Survey schedule

The investigation was conducted in two rounds as follows:

First round (urban area): February 7, 2019.

Second round (rural area): February 8, 2019.

3) Survey criteria

The inspection criteria for inspection of teeth were as follows [12,13]:

1: Healthy teeth: Teeth with no caries lesions or evidence of current caries lesion treatment.

2: Caries: A tooth with lesion showing softened hemorroids or free enamel.

3: Experienced cavities: Teeth filled with permanent filler, teeth without cavities around the filling, and teeth with artificial crowns for cavities.

4: Loss of caries experience: A tooth that has lost its permanent denture due to caries or caries treatment. However, abutment of processed dentures is an inexperienced caries tooth.

5: Loss of inexperienced caries: Permanent teeth lost due to causes other than caries (trauma, congenital encephalopathy, periodontal disease, orthodontics) and teeth with caries experience were excluded.

6: Crevice complete tooth: Tooth with clogged tooth groove.

7: Inexperienced caries teeth: Permanent teeth with artificial crowns or bands due to causes other than caries (trauma, aesthetic disorders, denture processing, orthodontics of fixation devices), and teeth with caries experience were excluded.

8: Unseeded teeth.

9: Unrecordable teeth.

4) Statistics processing

Descriptive statistics were calculated using SPSS version 24.0 after entering the oral examination results using the statistics program EXCEL (version 2016, Microsoft Inc, USA).

For primary school students, the caries experience rate (df rate), caries experience attraction index (dft index), caries experience attraction surface index (dfs index), caries attraction rate (dt rate), and treatment attraction rate (ft rate) were calculated. In addition, for middle school and high school students, the permanent teeth dental caries experience rate (DMF rate), caries experience permanent tooth index (DMFT index),

Table 1. Age and gender distribution of study subjects

Students' age	Champasak			Urban area			Rural area		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total	299	118	181	149	56	93	150	62	88
6 years	100	45	55	50	18	32	50	27	23
12 years	99	44	55	49	19	30	50	25	25
15 years	100	29	71	50	19	31	50	10	40

Table 2. Primary tooth dental caries experience rate of 6-year-old students in Champasak Province

Index	Value	Champasak			Urban area			Rural area		
		Total	Male	Female	Total	Male	Female	Total	Male	Female
dt	mean	5.21	5.16	5.25	5.20	5.22	5.19	5.22	5.11	5.35
	SD	3.96	4.07	3.90	4.07	4.21	4.05	3.89	4.05	3.77
ft	mean	0.09	0.20	0.00	0.12	0.33	0.00	0.06	0.11	0.00
	SD	0.64	0.94	0.00	0.85	1.41	0.00	0.31	0.42	0.00
dft	mean	5.30	5.36	5.25	5.32	5.56	5.19	5.28	5.22	5.35
	SD	3.91	3.96	3.90	4.00	4.00	4.05	3.85	3.99	3.77
ds	mean	11.60	11.91	11.35	11.80	12.22	11.56	11.40	11.70	11.04
	SD	10.87	10.40	11.34	11.77	10.78	12.46	10.01	10.34	9.83
fs	mean	0.29	0.64	0.00	0.52	1.44	0.00	0.06	0.11	0.00
	SD	2.61	3.88	0.00	3.68	6.13	0.00	0.31	0.42	0.00
dfs	mean	11.89	12.56	11.35	12.32	13.67	11.56	11.46	11.81	11.04
	SD	10.89	10.40	11.34	11.81	10.79	12.46	9.98	10.28	9.83
df rate	%	88.00	91.11	85.45	88.00	94.44	84.38	88.00	88.89	86.96
dt rate	%	98.30	96.27	100.00	97.74	94.00	100.00	98.86	97.87	100.00
ft rate	%	1.70	3.73	0.00	2.26	6.00	0.00	1.14	2.13	0.00

dt: Number of decayed primary teeth, ft: Number of filled primary teeth for dental caries, dft: Number of primary teeth with caries experience, ds: Number of decayed primary teeth surface, fs: Number of filled primary teeth surface for dental caries, dfs: Number of primary teeth surface with caries experience, df rate: Primary tooth dental caries experience rate, dt rate: Decayed primary teeth rate, ft rate: Filled primary teeth rate.

Table 3. Champasak middle school students' permanent teeth dental caries experience

Index	Value	Champasak			Urban area			Rural area		
		Total	Male	Female	Total	Male	Female	Total	Male	Female
DT	mean	0.62	0.48	0.73	0.98	0.84	1.07	0.26	0.20	0.32
	SD	1.23	0.90	1.43	1.55	1.17	1.76	0.63	0.50	0.75
FT	mean	0.12	0.05	0.18	0.22	0.11	0.30	0.02	0.00	0.04
	SD	0.46	0.30	0.55	0.62	0.46	0.70	0.14	0.00	0.20
MT	mean	0.01	0.00	0.02	0.02	0.00	0.03	0.00	0.00	0.00
	SD	0.10	0.00	0.13	0.14	0.00	0.18	0.00	0.00	0.00
DMFT	mean	0.75	0.52	0.93	1.22	0.95	1.40	0.28	0.20	0.36
	SD	1.28	0.98	1.46	1.57	1.27	1.73	0.64	0.50	0.76
DS	mean	1.37	1.02	1.65	2.18	1.84	2.40	0.58	0.40	0.76
	SD	3.17	2.76	3.47	4.12	3.91	4.30	1.50	1.12	1.81
FS	mean	0.19	0.05	0.31	0.37	0.11	0.53	0.02	0.00	0.04
	SD	0.78	0.30	1.00	1.07	0.46	1.31	0.14	0.00	0.20
MS	mean	0.05	0.00	0.09	0.10	0.00	0.17	0.00	0.00	0.00
	SD	0.50	0.00	0.67	0.71	0.00	0.91	0.00	0.00	0.00
DMFS	mean	1.62	1.07	2.05	2.65	1.95	3.10	0.60	0.40	0.80
	SD	3.43	2.77	3.85	4.42	3.91	4.73	1.50	1.12	1.80
DMF rate	%	35.35	29.55	40.00	51.02	47.37	53.33	20.00	16.00	24.00
DT rate	%	82.43	91.30	78.43	80.00	88.89	76.19	92.86	100.00	88.89
FT rate	%	16.22	8.70	19.61	18.33	11.11	21.43	7.14	0.00	11.11
MT rate	%	1.35	0.00	1.96	1.67	0.00	2.38	0.00	0.00	0.00
Mortal rate	%	17.57	17.39	17.65	20.00	22.22	19.05	7.14	0.00	11.11

DT: Number of decayed permanent teeth, FT: Number of filled permanent teeth for dental caries, MT: Number of missing permanent teeth for dental caries, DMFT: Number of permanent teeth with caries experience, DS: Number of decayed permanent teeth surface, FS: Number of filled permanent teeth surface for dental caries, MS: Number of missing permanent teeth surface for dental caries, DMFS: Number of permanent teeth surface with caries experience, DMF rate: Permanent tooth dental caries experience rate, DT rate: Decayed permanent teeth rate, FT rate: Filled permanent teeth rate, MT rate: Missing permanent teeth rate, Mortal rate: Caries fatality rate.

caries experience permanent tooth surface index (DMFS index), caries permanent tooth rate (DT rate), treatment permanent value rate (FT rate), etc., were calculated.

Results

1. Primary tooth dental caries experience rate of 6-year-old school students

The primary tooth dental caries experience rate of 6-year-old students in Champasak Province is shown in Table 2.

2. Permanent tooth dental caries experience rate of 12-year-old middle school students

The permanent tooth dental caries experience rate of 12-year-old students in Champasak Province is shown in Table 3.

3. Permanent tooth dental caries experience rate of 15-year-old high school students

Permanent tooth dental caries experience rate of 15-year-old student in the Champasak Province is shown in Table 4.

Discussion

In general, children in developed countries are known for their increased intake of soft food and drinks containing much, which leads to increased dental caries. Dental caries occurrence is decreasing in developed countries owing to dietary control methods. However, dental caries is increasing in developed and developing countries owing to increased consumption of fruit drinks, carbonated drinks, and snacks containing sugar [1-4]. Therefore, the author tries to collate the basic data required for starting an oral health program for Laos students.

Laos is divided into the capital city Vientiane and 16 provinces [14,15].

Champasak is a region in southwestern Laos near the border between Thailand and Cambodia. It is one of the three principalities that inherited the Kingdom of Laos from Langshan. The 2015 census shows its population as 694,023. The capital is Pakse, which took its name from Champasak, the former capital of the Kingdom of Champasak [15].

Table 4. Champasak high school students' permanent teeth dental caries experience

Index	Value	Champasak			Urban area			Rural area		
		Total	Male	Female	Total	Male	Female	Total	Male	Female
DT	mean	1.65	1.21	1.83	1.44	1.11	1.65	1.86	1.40	1.98
	SD	2.22	1.50	2.44	2.27	1.33	2.69	2.17	1.84	2.25
FT	mean	0.37	0.69	0.24	0.74	1.05	0.55	0.00	0.00	0.00
	SD	1.32	1.67	1.13	1.79	1.99	1.67	0.00	0.00	0.00
MT	mean	0.18	0.07	0.23	0.32	0.00	0.52	0.04	0.20	0.00
	SD	0.69	0.26	0.80	0.94	0.00	1.15	0.20	0.42	0.00
DMFT	mean	2.20	1.97	2.30	2.50	2.16	2.71	1.90	1.60	1.98
	SD	2.49	2.04	2.66	2.78	2.19	3.10	2.15	1.78	2.25
DS	mean	3.44	2.21	3.94	3.64	2.42	4.39	3.24	1.80	3.60
	SD	6.18	3.42	6.96	7.52	3.88	9.04	4.53	2.44	4.87
FS	mean	0.48	1.00	0.27	0.96	1.53	0.61	0.00	0.00	0.00
	SD	1.77	2.63	1.22	2.42	3.15	1.80	0.00	0.00	0.00
MS	mean	0.90	0.34	1.13	1.60	0.00	2.58	0.20	1.00	0.00
	SD	3.44	1.29	3.98	4.68	0.00	5.75	0.99	2.11	0.00
DMFS	mean	4.82	3.55	5.34	6.20	3.95	7.58	3.44	2.80	3.60
	SD	7.19	4.01	8.11	8.95	4.49	10.65	4.54	2.94	4.87
DMF rate	%	64.00	65.52	63.38	66.00	68.42	64.52	62.00	60.00	62.50
DT rate	%	75.00	61.40	79.75	57.60	51.22	60.71	97.89	87.50	100.00
FT rate	%	16.82	35.09	10.43	29.60	48.78	20.24	0.00	0.00	0.00
MT rate	%	8.18	3.51	9.82	12.80	0.00	19.05	2.11	12.50	0.00
Mortal rate	%	22.73	10.53	26.99	30.40	9.76	40.48	12.63	12.50	12.66

DT: Number of decayed permanent teeth, FT: Number of filled permanent teeth for dental caries, MT: Number of missing permanent teeth for dental caries, DMFT: Number of permanent teeth with caries experience, DS: Number of decayed permanent teeth surface, FS: Number of filled permanent teeth surface for dental caries, MS: Number of missing permanent teeth surface for dental caries, DMFS: Number of permanent teeth surface with caries experience, DMF rate: Permanent tooth dental caries experience rate, DT rate: Decayed permanent teeth rate, FT rate: Filled permanent teeth rate, MT rate: Missing permanent teeth rate, Mortal rate: Caries fatality rate.

True Chips borders Sarah Week and a half in the north, Sekon in the northeast, Atahu in the east, Cambodia in the south, and Thailand in the west. The Mekong River forms part of the border with neighboring Thailand and includes Si Phan Don ("Sichuan Island") in the southern part of the region bordering Cambodia [15].

Champasak Province has an area of 15,415 km²; the 2015 census shows its population as around 690,000 [15].

The author analyzed the oral examination results of 100 primary school, 99 junior high school, and 100 high school students to determine the degree of dental caries experience of children in the Champasak Province.

For 6-year-old primary school children, the dft index was 5.30, dfs index was 11.89, df rate was 88.00%, dt rate was 98.30%, and ft rate was 1.

For 12-year-old middle school children, the DMFT index was 0.75, DMFS index was 1.62, DMF rate was 35.35%, DT rate was 82.43%, FT rate was 16.22%, and caries fatality rate was 17.57%.

For 15-year-old high school children, the DMFT index was 2.20, DMFS index was 4.82, DMF rate was 64.00%, DT rate was 75.00%, FT rate was 16.82%, and caries fatality rate was 22.73%.

The DMFT index of 0.75 for 12-year-old children in the Champasak area was much lower than that of 2.18 for 12-year-old children nationwide in Laos in 2009; the DMFT index for 15-year-old children was lower than 3.20, the index for the total number of children in Laos in 2009. The degree of caries experience was found to have decreased [16,17].

In a comparison between urban and rural areas, the DMFT index for 12-year-old children was 1.22 in cities and 0.28 in rural areas. As for 15-year-olds, the index was 2.50 in cities and 1.90 in rural areas, indicating high caries experience in urban areas.

Caries experience was found to be high for most of the age groups. The df rate for 6-year-old children was 88%, DMF rate for 12-year-old children was 35%, and DMF rate for 15-year-old children was 64%.

In particular, as regards the proportion of untreated caries teeth, the dt rate for 6-year-old children was 98%, while the DT rates were 82% for 12-year-old and 75% for 15-year-old children. The caries fatality rate was from 18% to 22%. Thus, a treatment project should be introduced to stop the progression of caries and lower the caries fatality rate.

Laos, which once promoted economic development by introducing a market economy in a communist country, has only one dental college and an insufficient number of oral health assistants who are members of dental care. For the qualitative growth of dental care, the required manpower to meet the

needs of the people must be assessed, and efforts must be made to produce them through appropriate medical education.

Conclusion

The authors analyzed the oral examination results of 100 primary school, 99 junior high school, and 100 high school students to determine the degree of dental caries experiences of children in Champasak Province.

1. For 6-year-old primary school children, the dft index was 5.30, dfs index was 11.89, df rate was 88.00%, dt rate was 98.30%, and ft rate was 1.

2. For 12-year-old middle school children, the DMFT index was 0.75, DMFS index was 1.62, DMF rate was 35.35%, DT rate was 82.43%, FT rate was 16.22%, and caries fatality rate was 17.57%.

3. For 15-year-old middle school children, the DMFT index was 2.20, DMFS index was 4.82, DMF rate was 64.00%, DT rate was 75.00%, FT rate was 16.82%, and caries fatality rate was 22.73%.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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