

Ear, Nose, Throat, and Craniofacial Disease Screening in Primary School: Khon Kaen University 2017 Initiative

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Background: In 2017, Khon Kaen University was asked by the local community of Tambon Lao, Amphoe Kosum Phisai, Maha Sarakham Province to arrange a health project that could benefit the community. As this is a non-profit, community service, the request was fulfilled by the university. The Department of Otolaryngology-H&N Surgery volunteered and was selected as the primary project leader.

Materials and Methods: The first meeting with the local community leaders was held and it was agreed that screening of ear, nose, throat and craniofacial diseases be conducted as a pilot project in a primary school. The physical examination by the otolaryngologists included (a) a general appearance examination, (b) an ear examination using otoscopy, (c) a throat and neck examination, and (d) a nasal examination using rhinoscopy.

Results: From the 373 students who were enrolled in the study, 365 were screened for ear, nose, throat, and craniofacial disorder (97.9%). One student had a craniofacial anomaly (1.4%). The ear examination revealed pathologies in around 10 to 35% of subjects. The throat examination revealed problems in less than 10 to 20% of participants. Significant lymphadenopathy was found <5% of students. No significant nasal diseases were found among the students.

Conclusion: A pilot project was organized with the cooperation of local leaders and the community to conduct screening for ear, nose, throat, and craniofacial diseases among primary school students.

Keywords: Otolaryngology, Craniofacial anomaly, Screening

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Khon Kaen University [KKU] is the first and largest university in the northeastern region of Thailand. Its mission is to create a learning experience that brings people together and to promote local wisdom and cultural diversity, and to enhance local communities through research and academic services. As such, KKU has allocated budget support for non-profit community services in the Greater Mekong Sub-region.

In 2017, KKU was asked by the local community of Tambon Lao, Amphoe Kosum Phisai, Maha Sarakham Province to arrange a public health project that would benefit the community. The Department of Otolaryngology-H&N Surgery volunteered and was selected as the primary project leader.

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The first meeting with local community leaders was held and agreement was reached to conduct a screening pilot project for ear, nose, throat, and craniofacial diseases among primary school students. The objectives of this project were to identify the prevalence and incidence of ear, nose, throat, and craniofacial diseases in primary schools.

Materials and Methods

Local context

Tambon Lao is one of 17 sub-districts in Amphoe Kosum Phisai, Maha Sarakham province, northeast Thailand. The sub-district has 11 villages with a total population of 4,474. There are 2 public nurseries, 4 public primary schools, and 2 primary hospitals.

The four public primary schools were: 1) Ban Khwao Sadue E-san School, 2) Ban Taen Non Noongkoo School, 3) Ban Lao Nongkan School, and 4) Yang Sinchai Nonghad School.

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Intervention

Meeting with the local leaders

The head of the project (Dr. Benjamas Prathanee) and principal investigator (Dr. Patorn Piromchai) were elected at the first meeting of representatives from the 11 villages. In addition to personal introductions, the team opened a discussion to identify potential health problems in the sub-district. The consensus was (a) child and adolescent health and (b) elderly health. It was agreed that the first project would focus on primary school children and their health.

Meeting with the school principals

The community coordinator helped to conduct a one-day trip to survey the primary schools. We met with the principal of each primary school. The principals were welcoming, and we talked about the agreement between Khon Kaen University and the local community. The principals agreed that this project would help to improve the health status of the students in the schools.

Screening protocol

After the principals agreed that we start the project, consent forms for the guardian of students were distributed. The options for the guardians were: 1) allow the student to participate in the project and to report the results without personal identification; 2) allow the student to participate in the project but not to allow the data to be reported; and, 3) not to allow the student to participate in the project.

The physical examination by the otolaryngologists included: general appearance examination,

ear examination using otoscopy, throat and neck examination, and nasal examination using rhinoscopy. The data were collected in the case record forms and were extracted to a Microsoft Excel spreadsheet by a research assistant. The data were analyzed using SPSS version 20.0 (Chicago, IL). The categorical variables were presented as frequencies and percentages. The continuous variables were presented as means.

This project was approved by the Khon Kaen University Ethics Committees for Human Research.

Results

Of the 373 students enrolled in the study, 365 students were screened for ear, nose, throat, and craniofacial disorders (97.9%). Of the 365 students screened, 85 were in kindergarten (23.3%), 57 were in year one (15.6%), 54 were year two (14.8%), 48 were in year three (13.2%), 42 were in year four (11.5%), 35 were in year five (9.6%), and, 44 were in year six (12.05%) (Table 1).

Ear pathologies ranged from around 10% in schools C and D to 35% in schools A and B. In all schools, impacted ear wax was the most common ear disease. We found a foreign body (insect) inside the right ear of one student; the foreign body was removed without complications (Table 2).

Throat problems ranged from less than 10 % in schools A and B to 20 % in schools C and D. Chronic hypertrophic tonsillitis and dental caries were the most common problems. Tonsils hypertrophy occurred in around half of the students. In the students with tonsils enlargement, the most common type was grade 2 hypertrophies (Table 3).

We found no thyroid enlargement in any of

Table 1. Number of students both enrolled and screened

	School A		School B		School C		School D	
	Reg.	Sc.	Reg.	Sc.	Reg.	Sc.	Reg.	Sc.
Kindergarten	22	16	27	27	19	19	23	23
Grade 1	11	11	16	16	19	19	11	11
Grade 2	14	13	17	17	13	13	11	11
Grade 3	9	9	13	13	15	15	11	11
Grade 4	8	8	10	10	14	14	10	10
Grade 5	5	5	10	10	13	13	7	7
Grade 6	13	12	8	8	13	13	11	11
Total	82	74	101	101	106	106	84	84

Reg = Registered; Sc = Screened

the students. Cervical lymph node enlargement was found in 1 to 20%. Significant lymphadenopathy was found in less than 5% in schools B and C (Table 4).

The nasal examination indicated problems in less than 5 % of the students. Allergic rhinitis, acute rhinitis, acute rhinosinusitis, and nasal polyps were the most common diseases encountered (Table 5).

Discussion

A school is a place that students and teachers

do activities together. Students come from various backgrounds and lifestyles. In the confined space of a school setting, disease transmission is accelerated. Air, water, and food were the major vectors for disease transmission⁽¹⁻³⁾. Incidence rates of acute respiratory tract infection from six national developing country community-based studies ranged between 12.7 and 16.8 new episodes of acute respiratory tract infection per 100 child-weeks at risk. Rates of lower respiratory tract infection ranged between 0.2 and 3.4 new episodes per

Table 2. Ear examination results

Finding (%)	School A (n = 74)	School B (n = 101)	School C (n = 106)	School D (n = 84)	Total (n = 365)
Normal	47 (63.5)	64 (63.4)	91 (85.8)	72 (85.7)	274 (75.1)
Impacted ear wax	26 (35.1)	37 (36.6)	12 (11.3)	12 (14.3)	87 (23.8)
Acute otitis externa	0	0	1 (0.9)	0	1 (0.3)
Otitis media with effusion	1 (1.4)	0	1 (0.9)	0	2 (0.5)
Foreign body	0	0	1 (0.9)	0	1 (0.3)

Table 3. Throat examination results

Finding (%)	School A (n = 74)	School B (n = 101)	School C (n = 106)	School D (n = 84)	Total (n = 365)
Oral cavity and pharynx					
Normal	66 (89.2)	95 (94.1)	47 (44.3)	57 (67.9)	265 (72.6)
Chronic hypertrophic tonsillitis	3 (4.1)	2 (2.0)	20 (18.9)	17 (20.2)	42 (11.5)
Acute tonsillitis	0	0	1 (0.9)	0	1 (0.3)
Acute pharyngitis	3 (4.1)	0	14 (13.2)	0	17 (4.6)
Dental caries	1 (1.4)	4 (4.0)	21 (19.8)	10 (11.9)	36 (9.8)
Cleft lips/palate	1 (1.4)	0	0	10 (11.9)	1 (0.3)
Geographic tongue	0	0	3 (2.8)	0	3 (0.8)
Tonsils size					
Grade 1	60 (81.1)	57 (56.4)	57 (53.8)	58 (69.0)	232 (63.6)
Grade 2	11 (15.1)	31 (30.7)	35 (33.0)	21 (25.0)	98 (26.8)
Grade 3	2 (2.7)	12 (11.9)	13 (12.3)	5 (6.0)	32 (8.8)
Grade 4	1 (1.4)	1 (1.0)	1 (0.9)	0	3 (0.8)

Table 4. Neck examination results

Finding (%)	School A (n = 74)	School B (n = 101)	School C (n = 106)	School D (n = 84)	Total (n = 365)
Cervical lymph nodes					
Impalpable	73 (98.6)	93 (92.1)	76 (71.7)	81 (96.4)	323 (88.5)
Non-significant lymphadenopathy	1 (1.4)	5 (5.0)	25 (23.6)	3 (3.6)	34 (9.3)
Significant lymphadenopathy	0	3 (3.0)	5 (4.7)	0	8 (2.2)

Table 5. Nasal examination results

Finding (%)	School A (n = 73)	School B (n = 101)	School C (n = 106)	School D (n = 84)	Total (n = 365)
Normal	72 (100)	96 (95.0)	95 (90.6)	84 (100)	347 (95.1)
Allergic rhinitis	0	1 (1.0)	5 (4.7)	0	6 (1.6)
Acute rhinitis	1 (1.4)	1 (1.0)	5 (4.7)	0	7 (1.9)
Acute rhinosinusitis	0	2 (2.0)	5 (4.7)	0	2 (0.5)
Nasal polyps	0	1 (1.0)	0	0	1 (0.3)

100 child-weeks at risk. Children spend from 21.7 to 40.1% of observed weeks with ARI and from 1% to 14.4% of observed weeks with a lower respiratory tract infection⁽⁴⁾. In Thailand, the incidence rate of hospitalized acute lower respiratory tract infection was 5,772 per 100,000 child-years (95% CI 5,707 to 5,837), and was higher in boys than girls (incidence rate ratio 1.38, 95% CI 1.35 to 1.41)⁽⁵⁾.

Non-transmissible diseases were also found among the students. A recent study found that around 12% of students have hoarseness (7.8% in girls and 15.8% in boys)⁽⁶⁾ and dysarthria (range, 35 to 38%)⁽⁷⁾.

Khon Kaen University received funding from the government to develop the local community according to the “sufficiency economy” theory and sustainable community. Our team saw an opportunity to create better ear, nose, and throat health in the community. As the budget from the funding body was limited, the teaching staff at the Department of Otorhinolaryngology, Khon Kaen University, discussed ways to conduct the project without requiring more funding.

The project received very good co-operation from the community. More than 90% of the students enrolled were screened for ear, nose, throat, and craniofacial disorders. The principals of the schools had a major role in the success of the project. The project schedules and communications to arrange this project also needed help from the teachers.

The respective incidence of diseases was not higher than previous reports^(8,9). Our screening results were in agreement with the data from the Ministry of Public Health. The Ministry had data from all out-patient clinics in Thailand from 2005 to 2014, which indicated that the most common diseases were respiratory followed by gastrointestinal and oral⁽¹⁰⁾.

Our study revealed some unexpected conditions (i.e., foreign body in the ear and benign migratory glossitis)⁽¹¹⁻¹⁴⁾. Various types of nutritional

deficiencies can produce benign migratory glossitis and its associated inflammation. Changes-such as swelling of the tongue, papillary atrophy, and surface ulceration-are possible in most states of nutritional deficiency⁽¹⁴⁾.

Ear diseases were high in schools A and B, while throat diseases were high in schools C and D. Lymphadenopathy was found in schools B and C. No significant nasal diseases were found in any of the schools. The time of screening might be a factor of these discrepancy, as there was a viral outbreak spreading at the time we screened schools C and D. Further research is needed to uncover the reason(s) for the discrepancies.

The current project could not be generalized as a national scheme because an otolaryngologist was used to screen the students. Due to the dearth of specialists, a general practitioners or qualified nurses to screen the students. Most of the regions in Thailand still lack otolaryngologist which may be too busy to support the project.

The screening results will help in planning the next series of projects for this community.

Conclusion

We identified health problems among primary school students at the community level. This pilot project helps to estimate the extent of the problem for upcoming community-based service discussions on establishing sustainable community health.

What is already known on this topic?

Students represent the future of the nation. There are potentially undetected health problems among school-age children.

What this study adds?

Co-operation between the university and local community created an opportunity for identifying

health problems among school-age children so that these can be addressed.

The extent of undetected ear, nose, throat, and craniofacial problems among primary school children is significant.

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Potential conflicts of interest

The authors declare no conflicts of interest.

References

1. Leelayoova S, Siripattanapipong S, Thathaisong U, Naaglor T, Taamasri P, Piyaaraj P, et al. Drinking water: a possible source of *Blastocystis* spp. subtype 1 infection in schoolchildren of a rural community in central Thailand. *Am J Trop Med Hyg* 2008;79:401-6.
2. Hoge CW, Fisher L, Donnell HD Jr, Dodson DR, Tomlinson GV Jr, Breiman RF, et al. Risk factors for transmission of *Mycobacterium tuberculosis* in a primary school outbreak: lack of racial difference in susceptibility to infection. *Am J Epidemiol* 1994;139:520-30.
3. Pakalniskiene J, Falkenhorst G, Lisby M, Madsen SB, Olsen KE, Nielsen EM, et al. A foodborne outbreak of enterotoxigenic *E. coli* and *Salmonella* Anatum infection after a high-school dinner in Denmark, November 2006. *Epidemiol Infect* 2009;137:396-401.
4. Selwyn BJ. The epidemiology of acute respiratory tract infection in young children: comparison of findings from several developing countries. Coordinated Data Group of BOSTID Researchers. *Rev Infect Dis* 1990;12 Suppl 8:S870-88.
5. Hasan R, Rhodes J, Thamthitiwat S, Olsen SJ, Prapasiri P, Naorat S, et al. Incidence and etiology of acute lower respiratory tract infections in hospitalized children younger than 5 years in rural Thailand. *Pediatr Infect Dis J* 2014;33:e45-52.
6. Kallvik E, Lindstrom E, Holmqvist S, Lindman J, Simberg S. Prevalence of hoarseness in school-aged children. *J Voice* 2015;29:260-19.
7. Baptista MG, Novaes BC, Favero ML. Epidemiology of communication disorders in childhood phoniatric clinical practice. *Braz J Otorhinolaryngol* 2015;81:368-73.
8. Mathew JL, Patwari AK, Gupta P, Shah D, Gera T, Gogia S, et al. Acute respiratory infection and pneumonia in India: a systematic review of literature for advocacy and action: UNICEF-PHFI series on newborn and child health, India. *Indian Pediatr* 2011;48:191-218.
9. Sarkar R, Sivarathinaswamy P, Thangaraj B, Sindhu KN, Ajampur SS, Muliyl J, et al. Burden of childhood diseases and malnutrition in a semi-urban slum in southern India. *BMC Public Health* 2013;13:87.
10. Office of the Permanent Secretary for Public Health Ministry of Public Health. Number of out-patients by 21 cause groups according from health service units, Ministry of Public Health, Whole Kingdom: 2005-2014. Nonthaburi: Ministry of Public Health; 2016.
11. Piromchai P, Reechaipichitkul W. Migration of Foreign Bodies from the Upper Digestive Tract: A Case Series. *J Med Assoc Thai* 2015;98 Suppl 7:S248-52.
12. Sawyer DR, Nwoku AL. Malnutrition and the oral health of children in Ogbomosho, Nigeria. *ASDC J Dent Child* 1985;52:141-5.
13. Shulman JD, Beach MM, Rivera-Hidalgo F. The prevalence of oral mucosal lesions in U.S. adults: data from the Third National Health and Nutrition Examination Survey, 1988-1994. *J Am Dent Assoc* 2004;135:1279-86.
14. Huber MA, Hall EH. Glossodynia in patients with nutritional deficiencies. *Ear Nose Throat J* 1989;68:771-5.