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The Pilot Study for Health Check-Ups System at Elementary School in Cambodia

Channarena CHUON[1)], Somana SVAY[2)], Olline LIM[3)], Shintaro NAGASHIMA[1)], Chikako YAMAMOTO[1)], Ko KO[1)], Hiroko FUJII[1)], Masayuki OHISA[1)], Tomoyuki AKITA[1)], Noboru GOTO[5,6)], Mayumi FUJIMOTO[1)], Aya SUGIYAMA[1)], Keiko KATAYAMA[1)], Tomoki SATO[4)], and Junko TANAKA[1,*)]

1) Department of Epidemiology, Infectious Disease Control and Prevention, Graduate School of Biomedical and Health Sciences, Hiroshima 734-8551, Japan
2) University of Health Sciences, Phnom Penh, Cambodia
3) Ministry of Health, Phnom Penh, Cambodia
4) Hiroshima City Funairi Citizens Hospital, Hiroshima 730-0844, Japan
5) Department of Management Studies, Graduate School of Social Sciences, Hiroshima University, Hiroshima 730-0053, Japan.
6) NGO Hiroshima, Hiroshima 720-0812, Japan

ABSTRACT

Background: In Cambodia, there is no national health check-ups system for the schoolchildren and the general population. This pilot study aimed to promote a school health check-ups system in collaboration with the government of Cambodia.

Method: From 2016 to 2017, we conducted a survey in an elementary school in Siem Reap province, Cambodia. Two hundred and ninety-two students were eligible for data analysis. Physical examination, questionnaire and urinalysis were conducted using the Japanese school health check-ups model. Anthropometry was measured using the World Health Organization's growth reference data for school-age children.

Results: Among 292 schoolchildren, 88.7% were diagnosed as healthy. Based on the evaluation criteria of health examination in the study, two (0.7%) students with rale, one (0.3%) student with abnormal urinalysis, and another 27 students complaining of cardiopulmonary symptoms were recommended for further consultation at hospital. The prevalence of overweight (15.1%) was higher than that of underweight (8.6%). According to parents' questionnaires responses, the coverage rate of the National Immunization Program varied from 41.8% to 79.8% depending on each particular vaccine.

Conclusion: In this pilot study, we showed the prevalence of healthy among Cambodian schoolchildren and detected the students having possibility of health problem through this health check-ups and then recommended for further hospital visit. Based on the results, we assume that health check-ups system in elementary school as a whole Cambodia will be effective to assess the current health status in ordinary time and possibility of early detection of disease.

Key words: *school health check-ups*, *schoolchildren*, *Cambodia*

INTRODUCTION

School health check-ups are a part of the school health services of the World Health Organization's (WHO) Health Promoting Schools (HPS) framework. The HPS was launched in 1995 to help raise school health, prevent the spread of diseases during school life, and support education as well as the improvement of community health through schools. WHO has collaborated with several specialised United Nations agencies to develop a framework called Focusing Resources on Effective School Health. This framework outlines ways to improve schoolchildren's health and community association with Sustainable Development Goals by 2030. Accordingly, the results of numerous studies on school health were introduced worldwide to encourage school health and placed it against the background of public health issues in each country[27,28,34,35)].

Cambodia has transformed into a middle-income country from its previously defined category as low-income country due to recent economic development. Among 16 million population in 2016, more than two million children were enrolled in primary schools[31,32)]. Therefore, the Ministry of Health (MoH) and Ministry of Education, Youth, and Sport (MoEYS) have joined

* Corresponding author: Junko Tanaka, Prof, Ph.D.
Department of Epidemiology, Infectious Disease Control and Prevention, Graduate School of Biomedical and Health Sciences, Hiroshima University, 1-2-3 Kasumi, Minami-ku, Hiroshima 734-8551, Japan
Tel: +82-81-257-5160, Fax: +81-82-257-5164, E-mail: jun-tanaka@hiroshima-u.ac.jp

together to establish a school health policy and a national plan to promote health in schools and to increase welfare in children and women as well as vulnerable persons in Cambodia[19]. In spite of these national strategic plans by the Cambodian government to promote the health of schoolchildren, there were few studies focusing children's health[4,9–11,24,26]. Up to now, there is no published data on health check-ups in Cambodia. Therefore, we aimed to examine the health check-up system in elementary schools in Cambodia in collaboration with MoH. In Japan, during the Meiji era, school health programme was launched in response to epidemics of infectious diseases, engagement of nutritional and growth development in children. Nowadays, these school health programmes have contributed enormously to the development of the Japanese society[12]. In Japan, school health check-ups database is also used as reference data during disaster or emergency management. Therefore, the primary aim of this study is to investigate the current health status of schoolchildren in Cambodia using Japanese school health check-ups model. Then, we will propose evidence-based recommendations for establishment of effective elementary school health check-ups system in Cambodia.

MATERIALS AND METHODS

Study design and subjects

This pilot study was conducted among students of grades 3 and 4 (2015–2016 academic year) and grades 3 and 6 (2016–2017 academic year) at the Teacher Training Elementary School in Siem Reap province, Cambodia between June 2016 and August 2017. This school was selected based on the recommendation of the local government for two reasons. Firstly, it receives MoEYS support for training teachers throughout the northeast region of Cambodia. Second, it is a nationally recognised school in terms of its quality of education and school health policy. This study was performed by researchers and medical doctors, including a paediatrician, from Hiroshima University, in cooperation with the MoH, Provincial Teacher Training Colleague of Siem Reap province, Siem Reap Provincial Referral Hospital, and the University of Health Sciences in Cambodia. This study included a physical examination, questionnaire, and urinalysis. Totally, 349 students were asked to participate in our study; ultimately, as 55 were absent and did not submit the consent forms, 294 students provided their legal guardians' consent and agreed to participate. Two out of 294 students were excluded because missing questionnaire and physical examination documents. Therefore, the data from 292 students (135 in 2016 and 157 in 2017) were finally analysed (Figure 1). The questionnaires and a sterile urine collection set were distributed on the day of the explanation of the study, which was one or two days before the physical examination. Prior to this survey, we obtained permission from the local authorities such as school principals, duty officers at the MoH (Phnom Penh and Siem Reap) and the staffs at the University of Health Sciences in Phnom Penh. We also asked the school principals to notify at least one week ahead to students and their parents or guardians to attend the explanation session at school. The local authorities were also invited to attend our explanation session and data collection at school together with the students and their parents/guardians.

Ethical consideration

The study was approved by the Ethics Committee for Epidemiological Research of Hiroshima University in Japan (Permission No.: E-224-1) and by the MoH, Cambodia (Permission No.: 0085 NECHR). Consent was obtained from each legal guardian of the participated student.

Measurements and procedures

In 2015, we conducted a sentinel study among 87 elementary schoolchildren in Siem Reap province, after which we revised and expanded the questionnaire, physical examination, and urinalysis according to the Manual on Japanese School Health Check-ups[15]. The physical examination included assessments of height and weight, ear-nose-throat (ENT)[13], lung and heart by medical doctors from Hiroshima University. Tonsillar hypertrophy was defined as a grade ≥ 3 according to Brodsky's classification[2]. The results of the health check-ups were feedback to all students on the next day. Healthy students received a health certificate from our team via the school principal and based on the evaluation criteria of our study, the suspicious unhealthy students were recommended to go and consult at hospital for further examination (Figure 2). The questionnaires included 16 major items, including 3 for current medical history of the child, 2 for past medical history, 8 for subjective symptoms, 1 for vaccination history and 2 for past medical history of the family. The questionnaire was translated from English to Khmer by translators in easy understanding way which then counterchecked by the local authorities. The questionnaire was filled by parents or legal guardians at home, and students returned it to school on the day of the physical examination. We instructed students to urinate before going to bed (empty bladder at night) and then asked them to collect urine early in the morning on the day of the physical examination. Among them, 290 students brought urine specimens to school. The urine specimens were screened for hematuria, proteinuria, and glycosuria using a urine dipstick test (Uropaper III, Eiken Chemical Co. LTD, Japan). On the day of the health check-ups, our research team confirmed whether each student had collected urine that early morning or not. After that, all the urine samples were taken to Siem Reap Provincial Referral Hospital for testing.

Anthropometric measurements

In Cambodia, children are generally enrolled in elementary school at the age of six years, or at least 70 months old[20]. In this study, we were able to confirm their age in month of every student on the school enrolment list. We used the WHO's growth reference data for

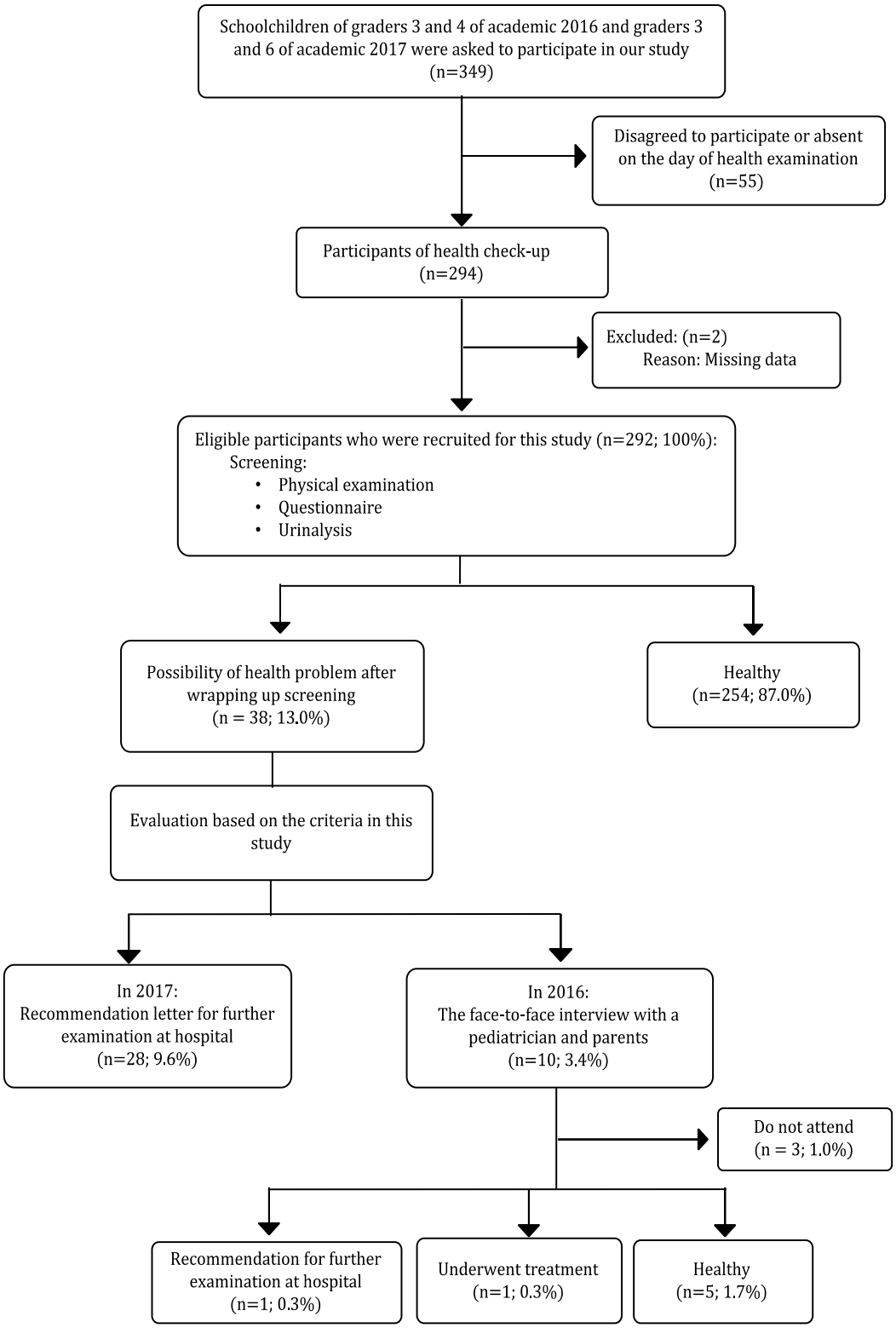

Figure 1 Flow diaphragm of study participants. This flow chart shows the process of health check-ups model used in our study.

the 5–19-years age group, in which the growth chart was classified by the Standard Deviation (SD) of the body mass index (BMI) value. The reference value of SD is set differently depending on their age in month[8]. The classifications are: overweight: > +1SD (equivalent to BMI 25 kg/m^2 at 5–19 years); obesity: > +2SD (equivalent to BMI 30 kg/m^2 at 5–19 years); thinness: < −2SD; and severe thinness: < −3SD. We measured the height and weight of all children. Height was measured in meters using a Seca mobile stadiometer model 213 (gmbh&co.kg) and weight was measured in kilogram unit using TANITA digital weight scale. Then, BMI was calculated as the body mass divided by the square of the body height which is universally expressed in units of kg/m^2, resulting from mass in kilograms and height in metres.

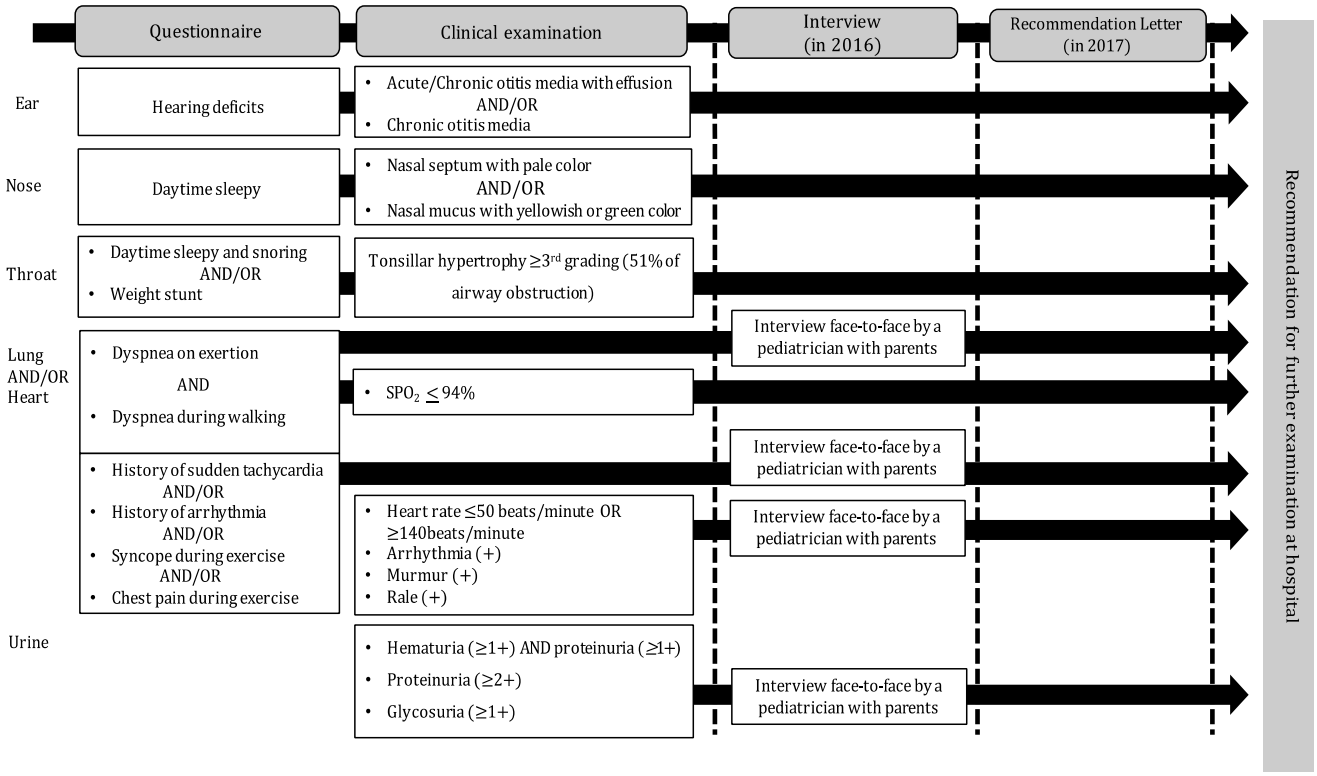

Figure 2 Evaluation criteria of the school children recommend for further examination of our study. This algorithm shows how the final decision on the health check-ups is done based on the results of questionnaires, clinical examination, face-to-face interview with the corresponding parents/guardians in 2016 and recommendation letter in 2017.

Statistical analysis

All data were entered in Microsoft Excel and descriptive statistics were analysed using JMP version 11 (SAS Institute Inc., located at SAS Campus Drive, Cary, NC, USA 27513).

The required sample size (n) was calculated by using the following formula.

$$n = \frac{Z_{\frac{\alpha}{2}}^2 P(1-P)}{d^2}$$

Under assumption P, which is the expected prevalence of unhealthy students, was set as 20% based on the result of our sentinel study in 2015 and d, which is the margin of error, was set as 5% (d = 0.05). $Z_{\frac{\alpha}{2}}$ is upper α/2 point of normal distribution. When α-level is 0.05, then $Z_{\frac{\alpha}{2}}$ = 1.96. Based on the formula, required sample size (n) was estimated at 259. Considering response rate was 65%, we determined the target sample size 350. While 294 students among 349 students participated in this study, 292 were eligible for data analysis (response rate 83.7%).

RESULTS

Two hundred and ninety-two students (54.5% boys and 45.5% girls; with an average age of 9.8 ± 1.7 years) were eligible for data analysis. The characteristics of the schoolchildren are shown in Table 1. In general, Cambodian children attend elementary school for six years; however, some students repeat grades and take longer to graduate, and others enrol after the age of seven. For this reason, the subjects in this study included students aged 13 years and over. The prevalence of overweight and underweight was 15.1% (44/292) and 8.6% (25/292), respectively (Table 2). According to the legal guardians' questionnaire responses, 182 (62.3%) students had dental caries, stunting (24.7%; 72/292), history of sudden tachycardia (6.2%; 18/292), history of arrhythmia (2.1%; 6/292), syncope during exercise (1.0%; 3/292), chest pain during exercise (4.5%; 13/292), dyspnoea on exertion (14.0%; 41/292) and dyspnoea during walking (8.6%; 25/292), as shown in Figure 3. The vaccination coverage based on parents' reports was 50.0% for diphtheria, 47.3% for pertussis, 60.6% for tetanus, 62.0% for BCG, 41.8% for hepatitis B, 66.4% for polio, and 79.8% for measles (Figure 4).

Table 3 shows the results of the physical examination including ENT, lung and heart. By the clinical findings of otoscopy examination, rupture (2.1%; 6/292), bloody (2.1%; 6/292), effusion (1.4%; 4/292), inflammation (1.4%; 4/292) and discharge (0.3%; 1/292) were found. However, based on the Japan Otological Society's guidelines, 20 (6.9%) students were suspected to have otitis media. Moreover, two (0.7%) students were found to have tonsillar hypertrophy grade 3. For another two (0.7%) students, rale was detected by auscultation. Urinalysis results showed that seven (2.4%) students had proteinuria 1+ and one (0.3%) student had hematuria 2+ with proteinuria 1+ (Table 4).

In our study, out of the 292 students who underwent a complete school health check-up, including the questionnaire, physical examination, and urinalysis, 38 (13.0%)

Table 1 Characteristic of the school children (n = 292)

Age as of examination (years)	Total n (%)	Girl n (%)	Boy n (%)
7	3 (1.0)	1 (0.8)	2 (1.3)
8	63 (21.6)	37 (27.8)	26 (16.4)
9	93 (31.9)	42 (31.6)	51 (32.1)
10	43 (14.7)	13 (9.8)	30 (18.9)
11	40 (13.7)	16 (12.0)	24 (15.1)
12	31 (10.6)	17 (12.8)	14 (8.8)
13	12 (4.1)	6 (4.5)	6 (3.8)
14	3 (1.0)	0 (0.0)	3 (1.9)
15	2 (0.7)	0 (0.0)	2 (1.3)
16	1 (0.3)	1 (0.8)	0 (0.0)
17	1 (0.3)	0 (0.0)	1 (0.6)
Total	292 (100.0)	133 (100.0)	159 (100.0)

This table indicates distribution of 292 school children who participated in our study by age and sex.

Table 2 Body Mass Index-for-age (5–19 years) WHO growth reference 2007 of schoolchildren (n = 292)

Overall	Total (n = 292) n (%)	Girl (n = 133) n (%)	Boy (n = 159) n (%)
Obesity: > +2SD	17 (5.8)	5 (3.8)	12 (7.5)
Overweight: > +1SD	27 (9.2)	14 (10.5)	13 (8.2)
Normal	223 (76.3)	101 (75.9)	122 (76.7)
Thinness: < −2SD	22 (7.5)	12 (9.0)	10 (6.3)
Severe thinness: < −3SD	3 (1.0)	1 (0.8)	2 (1.3)

This table indicates the body mass index from height and weight measurement from our study

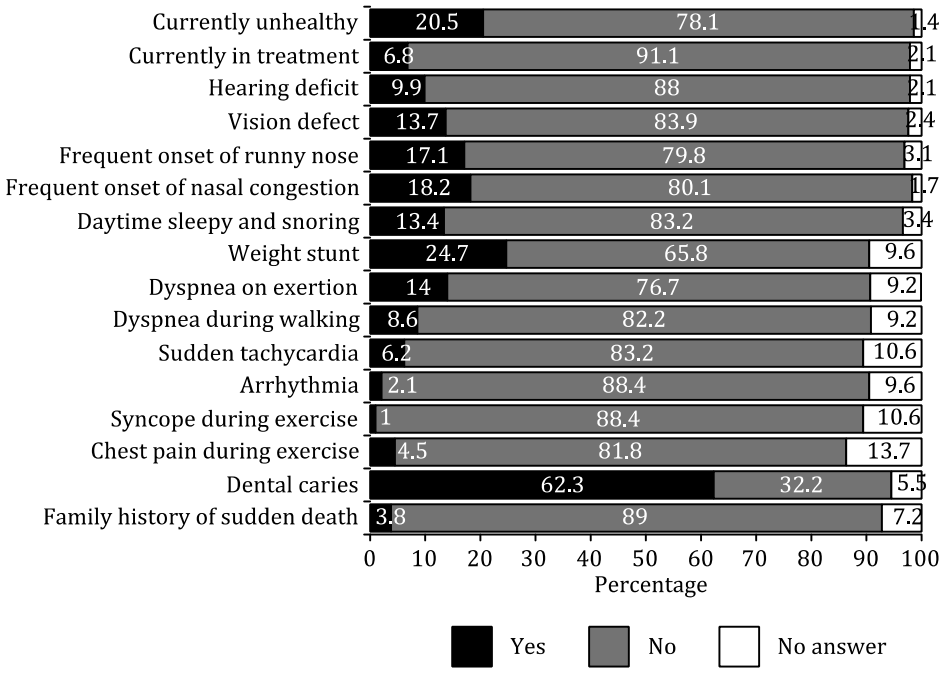

Figure 3 The results of questionnaire responded by parents or guardians of the school children (n = 292). This figure shows the distribution of health problems found among school children based on the questionnaires. In each bar, the black color indicates "Yes", the grey color represents "No" and the white color for "No answer" to the questions.

had the possibility of health problems in which 10 (3.4%) students were from 2016 and the rest of 28 (9.6%) were from 2017 health check-ups. In contrast to 2017, we conducted face-to-face interviews in 2016 with parents of students suspicious of having some abnormality before recommending them for further consultation at the hospital. This face-to-face interview aimed to analyse whether the parents were well understood the meaning of the questionnaire. However, in 2017, face-to-face interviews were not done because of the improvement of translational level of the questionnaire and all the students with abnormal findings received a recommenda-

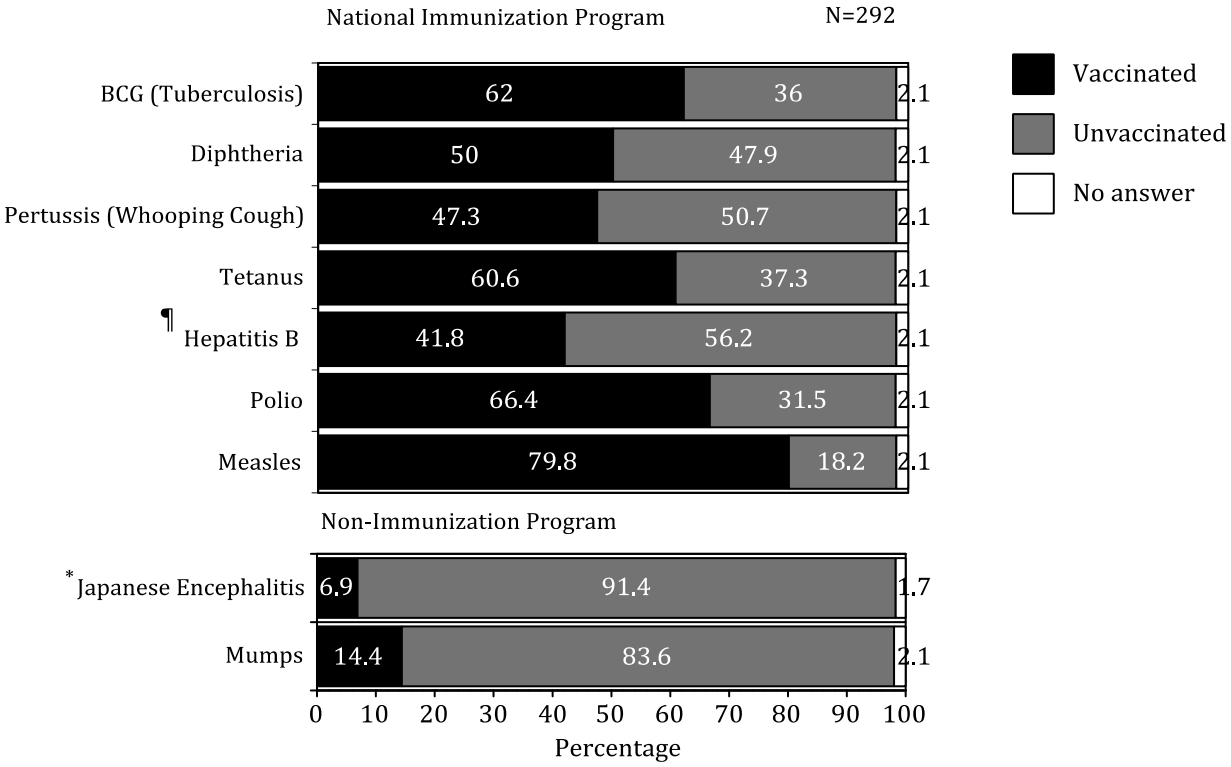

Figure 4 Questionnaire answered to the vaccination history of the school children by the legal guardians. Each bar shows the response to questions related to vaccination history among studied children to those vaccines administered by Ministry of Health in Cambodia. The black color indicates "already vaccinated", the grey color for "unvaccinated" and the white color for "No answer" to the questions. The signature "¶" means that Hep-B vaccine is introduced in 2001 and Monovalent Hep-B (received vaccine less than 24hours after birth) and Pentavalent Including Hep-B, Hib, DPT 3 doses (4, 6, 10 weeks of age) has been adopted in national immunization program since 2005. The signature "*" indicates that Japanese Encephalitis vaccine has been introduced in 3 provinces since 2010.

tion letter describing a further examination at a hospital.

In 2016, seven out of 10 parents answered that their children had a history of sudden tachycardia and/or syncope during exercise but we did not detect any abnormal findings on physical examination. One student had tonsil hypertrophy grade 3 with daytime sleepiness, one was auscultated with rale and one had abnormal urinalysis. Seven out of 10 parents were willing to receive a face-to-face interview, of which 4 parents answered that their child had syncope or tachycardia in the questionnaire but after the interview we diagnosed they were not sick. The parent of a child diagnosed as tonsillar hypertrophy grade 3, explained that the child was very active; therefore, we did not recommend a hospital visit. According to the interview with the parent, the student with rales had been hospitalized for breathing difficulty last three months ago, so we advised them to continue the treatment and regular follow-up visit to the hospital. For the student with abnormal urinalysis, the parent said the child did not have any particular medical history, but we recommended further examination at hospital.

In 2017, out of the 28 diagnosed with some abnormality, 18 had a history of sudden tachycardia and/or arrhythmia and/or syncope during exercise and/or chest pain during exercise and nine had dyspnoea on exertion and dyspnoea during walking without abnormal physical findings. Another one had rale with fever. All 28 students received the recommendation letters for further examination at the hospital. Considering the results of the interview in 2016, a total of 88.7% (259/292) students were diagnosed as healthy.

DISCUSSION

This was a study on school health check-ups among elementary schoolchildren in Cambodia, conducted jointly with the government of Cambodia and researchers from Japan.

We conducted school health check-ups, including physical examinations, questionnaire and urinalysis, using Japanese school health check-ups model at the elementary school in Siem Reap province, Cambodia. In the previous studies in Cambodia, it was mainly reported that children tended to be more malnutrition than overnutrition[11,24]. Ikeda et al. showed that the prevalence of stunting in children under five years old was 49.3% in 2000, which decreased to 39.0% in 2010[11]. Perignon et al. showed that the prevalence of stunting and severe stunting was 40.0% (965/2443) and 10.9% in children aged six and 16 years old, respectively[24]. All the above studies used the WHO guidelines on growth reference to assess weight status, same as this study. According to our findings, the prevalence of overweight (15.1%; 44/292) was higher than that of underweight (8.6%; 25/292). In a comparative study on seven ASEAN countries including Cambodia, Pengpid et al. showed that the prevalence

Table 3 The results of physical examination (n = 292)

Variable	Examination	Categories	Clinical signs	n (%)
Ear	Eardrum	Normal		240 (82.2)
		Invisible	Bilateral	19 (6.5)
			Unilateral	10 (3.4)
		Rupture		6 (2.1)
		Other	Cerumen	43 (14.8)
			Injury	9 (3.1)
			Bloody	6 (2.1)
			Muddy	5 (1.7)
			Effusion	4 (1.4)
			Inflammation	4 (1.4)
			Discharge	1 (0.3)
Nose	Color of septum	Normal		290 (99.3)
		Red		2 (0.7)
		Pale		0 (0.0)
	Color of mucus	Normal		292 (100.0)
		Green/yellowish		0 (0.0)
		White		0 (0.0)
Throat	Tonsil	Grade 1 (≤ 25%)		239 (81.9)
		Grade 2 (25–50%)		27 (9.3)
		Grade 3 (51–75%)		2 (0.7)
		Grade 4 (≥ 76%)		0 (0.0)
		Invisible		24 (8.2)
Heart	Heart rate	Bradycardia (≤ 50 b/m)		0 (0.0)
		Normal (51–115 b/m)		292 (100.0)
		Tachycardia (≥ 140 b/m)		0 (0.0)
	Arrhythmia	No arrhythmia		292 (100.0)
		Arrhythmia		0 (0.0)
	Heart murmur	No murmur		292 (100.0)
		Murmur		0 (0.0)
Lung	Oxygen saturation	SpO2 ≥ 94%		292 (100.0)
		SpO2 < 94%		0 (0.0)
	Lung sound	Normal		290 (99.3)
		Rale		2 (0.7)

This table indicates the clinical findings among 292 school children by examined physical examination in our study.

Table 4 The result of urine analysis of the school children (n = 290)

		Proteinuria				
		Negative n (%)	Trace n (%)	1+ n (%)	2+ n (%)	3+ n (%)
Hematuria	—	214 (73.8)	50 (17.2)	7 (2.4)	0 (0.0)	0 (0.0)
	Trace	13 (4.5)	5 (1.7)	0 (0.0)	0 (0.0)	0 (0.0)
	1+	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
	2+	0 (0.0)	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)
	3+	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

This table indicates the outcomes of urine analysis from 290 school children who submitted the urine specimens.
In the box, the black color indicates “the school children suspected with urine abnormality during health check-up” and the white color indicates “the school children didn’t find the urine abnormality during health check-up”.

of overweight was 3.7% in Cambodia in 2015, but it was higher in high-income countries as in Malaysia and Thailand[23]. In Cambodia, the aging population and non-communicable diseases have come to be major public health concerns with regards to the gradual improvement in socioeconomic status year by year[31,32]. Our results suggest the possibility of change in nutritional status, lifestyle at home, school time activity, and other factors among elementary schoolchildren in Cambodia, but selection bias should be considered because this study was conducted only in one public school in urban area. However, 24.7% (72/292) of the parents reported

that their children had growth stunt. This result may suggest the lack of awareness on the nutritional knowledge among parents or guardians. Promoting physical activity and healthy diet is necessary for children in Cambodia in order to prevent obesity or lifestyle-related diseases. In addition, health education should be provided not only to the children but also to their parents.

Of the 292 students who participated in the study, the questionnaire responses, physical examination, and urinalysis of 38 (13.0%) indicated the existence of health problems. Ten (3.4%) and 28 (9.6%) of these students were in 2016 and in 2017, respectively. After a face-to-face interview in 2016, however, five out of 10 students were diagnosed as healthy; therefore, 88.7% (259/292) of students were diagnosed as healthy. Among the 29 (9.9%) students to whom hospital visits were recommended, 27 (9.2%) answered 'Yes' to the following items in the questionnaire: a history of dyspnoea or tachycardia or arrhythmia or syncope or chest pain. As for the screening test for the heart and lung, this study included only the questionnaires and physical examination data. However, in Japan, school health check-ups for the heart include not only the questionnaire and physical examination but also an electrocardiogram[14]. Japan is the only country that conducts nationwide heart disease screenings for all elementary school students[1,41]. In some countries, the pre-participation screenings are conducted only for young people participating in a competitive sport[6,18]. As a result of the heart disease screenings for all students under school control in Japan, a clear reduction in mortality from cardiovascular or large vessel disease has been achieved[42]. In this study, 9.2% of parents complained that their child had cardiopulmonary symptoms, and so they were recommended for further examination at hospital. Based on this result, it is desirable to consider the introduction of heart disease screening for elementary school students in Cambodia.

Prior to the 2000s, urine screening in elementary schoolchildren was initiated in Japan[21], Korea[5], and Taiwan[17]. Based on the outcomes of those studies, urine screening in school was the most effective method to detect kidney disease in the early stages. In this study, 0.3% of students were detected with an abnormality in urinalysis and they were also recommended to visit the hospital. The prevalence of abnormal urinalysis was almost the same as the previously reported prevalence in Japanese elementary school urinalysis of 0.38% (1,056/227,029)[22].

In our study, it was indicated that 6.9% (20/292) of students had otitis media. However, since none of them had impaired hearing, we did not recommend further examinations. Hearing impairment has been reported to be a factor that can cause disability in speaking and academic performance in schoolchildren[3,7,33,39]. According to the Japanese school health check-ups, Japan Otological Society guidelines, as well as previous studies, pure tone audiometry (PTA) is useful appliance to verify hearing disorders[7,13,15,39]. Hence, we would like to suggest for using PTA in school health check-ups research in the future.

The reported 62.3% dental caries by legal guardians in our study was lower than that in a previous national oral health survey in Cambodia (80.4%) in 2011[4]. The risk factors for dental caries were food and sugar intake behaviours, poor oral hygiene in children of the vast majority of developing countries[4,26]. The results from our study and those of Chher et al. show that oral problems remain a major part of the public health issues in Cambodia. Therefore, we also suggest the inclusion of dental health screening in school health check-ups to promote health for children in Cambodia.

In 1986, the Expanded Program on Immunization (EPI) was launched in Cambodia in response to infectious diseases such as diphtheria, pertussis, tetanus, tuberculosis (TB), polio, and measles. In 2015, WHO reported that the EPI had achieved more than 90% coverage in Cambodia, resulting in a sharp decrease in the incidence of those vaccine preventable diseases. Cambodia has maintained a polio-free status since 2000 and also achieved its measles and neonatal tetanus elimination goals in 2015. In addition, there were no incidences of diphtheria from 2013 to 2015, but pertussis was 0.1 per 100,000 people in 2015. The incidence of TB was 6,700 per 100,000 people in 2016[36]. However, Cambodia is a highly endemic area for hepatitis B virus (HBV) infection with a high hepatocellular carcinoma mortality rate. It is necessary to promote measures against viral hepatitis and hepatocellular carcinoma as an urgent task together with preventive measures for other infectious diseases[9,37,38]. In Japan, against the background of the high hospital birth rate, HBV screening for all pregnant women at antenatal care units and the administration of hepatitis B immunoglobulin to those born from HBV-positive mothers was started in 1986, and Japan has achieved great success in the prevention of mother-to-child (vertical) infection[16,29,30]. In Cambodia, universal vaccination (birth dose of HB vaccine) was introduced in 2005. However, in this study, according to the parent reports, the immunization coverage of HB vaccination (41.8%) is the lowest among the National Immunization Program in Cambodia. Elementary school which is supposed to be the most optimal institution to grasp the health condition of the whole paediatric population where assessment for the vaccination can be done. Moreover, the assessment on hepatitis B surface antibodies will be useful for catch-up vaccination of HBV to school children with lack of antibody.

The establishment of a health check-ups system in elementary schools not only gives an opportunity for health education by grasping the health condition of children but also has the significance of collecting basic national health data. In Japan, primary school health examinations had been introduced since the Meiji era, and their basic data served as the referenced database to evaluate the health problems after the atomic bombs in Hiroshima and Nagasaki as well as nuclear damage in Fukushima[25,40]. In Cambodia as well, based on the fact that nuclear power plants will be introduced in the future, implementation of such medical examination system will be an important foundation in evaluating the health haz-

ards during or after emergencies such as radiation disasters and warfare.

CONCLUSION

This is a preliminary study, conducted jointly with the government of Cambodia and researchers from Japan, which aims to establish an effective elementary school health check-ups system in Cambodia. We showed the prevalence of healthy among schoolchildren of Cambodia and detected the students with possibility of health problem through this screening and recommended for further consultation at the hospital. Based on the results, we assume that health check-ups system in elementary school in nationwide will be effective in assessing the current health status in ordinary time and possibility of early detection of disease.

Abbreviations

HPS: Health Promoting Schools; MoEYS: Ministry of Education, Youth, and Sport; WHO: World Health Organization; PTA: Pure Tone Audiometry; DPT: Diphtheria Pertussis Tetanus; HBV: hepatitis B virus; EPI: Expanded Program on Immunization.

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