

Health Education in School Children

Children's Sight and Health project is run by a small group of expat volunteers in Chiang Mai. The project is engaged in testing vision in selected schools to prescribe eyeglasses to those who may have visual impairment, in hope that it enhances their ability of learning. The project¹ has been in operation since October 2015 and is led by an optometrist for vision testing. One of the volunteers, a public health doctor, suggested the inclusion of health education along with the vision testing. As a result, in May 2022, the project started assessing children's nutritional needs with the aim to address malnutrition awareness.

Malnutrition, both under and over nutrition, are serious public health problems. Poorly nourished children, result in subnormal growth (stunting) for their age because of inadequate feeding in early childhood and those with overweight and obesity by overfeeding. Whilst little can be done for stunted growth for already affected children, there is hope for those with the tendency for gaining abnormal weight. Under nutrition with suboptimal growth and poor physical and intellectual development; and overnutrition as a precursor to chronic non-communicable diseases later in life, such as diabetes, cardiovascular problems and even certain cancers. According to the Public Health Ministry, the obesity rate of Thai children was found to be higher than the target value of 10%. Obesity rate of school children between 2018, 2019 and 2020 has risen to 11.8%, 13.6% and 12.78% respectively.² Unfortunately, stunting does not attract much attention and short stature is somehow acceptable.

The project's preliminary findings demonstrate that school children aged 13-19, 26.5% are below normal weight. Undernourished children below 13 years of age were found to be almost double at 52.9% and almost 9% were below BMI 15, which is severe under nutrition. Almost half of these children catch up as they grow older, demonstrating that there is potential for improvement before children reach optimal growth, nevertheless a quarter of all teenagers remain underweight. These children are short or thin (stunted) for their age, which is a permanent condition and is largely attributed to poor nutrition and weaning practices in early childhood (6 to 36 months). Inadequate intake of proteins, calories and other nutrients after weaning, contributes not only to physical stunting, but also to lower potential of intellectual development.³ During this period child needs to be skillfully fed by mother/caretaker. The only lasting solution would be to educate teachers and students about the fact and the need for proper care of the under-fives to remedy the situation for the future generations.

The physical inactivity and the type of food we eat are the primary reasons for increase in the levels of overweight and obesity and the rise of non-communicable diseases (NCDs) have been linked to this lifestyle. Teenagers are no exception to this and overweight and obesity is a fast-growing health problem among them. These children, unless helped early, are the ideal candidates for diabetes, hypertension, and many other chronic diseases, including some cancers in their adult life. Perhaps the best demonstration of this is among the teachers, where more than 35% were found to be overweight or obese. Teacher's involvement in remedying this problem is equally important.

Health awareness and education is acutely felt need in all schools. Health illiteracy problem is felt all over the world and has been described as a silent epidemic.⁴ Regular monitoring of heights and weights

¹ www.facebook.com/chiangmaichildrensightproject/

² link:<https://www.bangkokpost.com/thailand/general/2029071/obesity-stunted-growth-in-thai-kids-spur-worries>. Bangkok Post 3rd Dec.2020.

³ How does nutrition affect the developing brain? <https://www.zerotothree.org/resource/how-does-nutrition-affect-the-developing-brain/>

⁴ Editorial. The health illiteracy problem in the USA. Lancet.com Vol 374 December 19/26, 2009

for school children is a useful measure to interpret the state of growth, which is also of interest to the growing children. Great number of them are anxious about their growth and wish to be taller or shorter. Same applies to the weight. Fortunately, most schools in Thailand are required to measure heights and weights of all children regularly. However, the feedback is inadequate and is rarely linked it to the lifestyle.

From May 2022, the eye project included health education along with the vision testing program. To date three schools have been surveyed covering over 600 children. The project plans to continue this activity along with the eye testing in schools. Total involvement of the school management is sought for this activity. The project engages teachers and students in understanding the causes of common preventable diseases through dialogue. Poor nutritional choices and unhealthy lifestyle are the most important underlying factors leading to under and over nutrition, which is the precursor to a number of chronic health problems. Growth monitoring and nutritional needs among young and adolescent is an ideal start. Measurement of heights and weights opens up an opportunity for discussions on optimum growth and healthy weight. This starting point is even more important as children are conscious of their growth, some want to put on weight and others are more concerned to remain slim. Proper advice at this stage helps in clearing the misconceptions. Introduction of healthy nutrition and regular exercise will help children to grow healthy. The dialogue also provided an opportunity to discuss other health issues that may be in the young minds.

The three schools covered so far, are from different backgrounds and hence may not be representative of general schools in the province. As the project continues to review heights and weights along with eye testing, we will have a better understanding of the situation.

Chalermprakret School is a girl’s boarding school and admits girls from poor families, orphans, physically abused and in some cases girls from HIV/AIDS affected families.

School for the Deaf, as the name suggests, caters for children with severe hearing problems. Both, girls and boys attend the school as day scholars. The school is situated in the middle of the city with beautiful grounds and have well qualifies staff with sign language skills. Some teachers are themselves with hearing problems.

School in San Sai district is more typical of a rural population. This school functions from two separate campuses, one for the senior students 11-19, whilst the other campus catering to the younger children 7-11.

Table below shows the schools, their location and other characteristics:

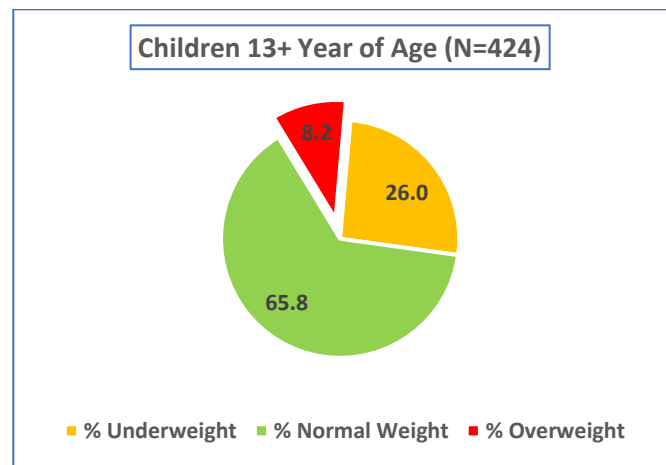
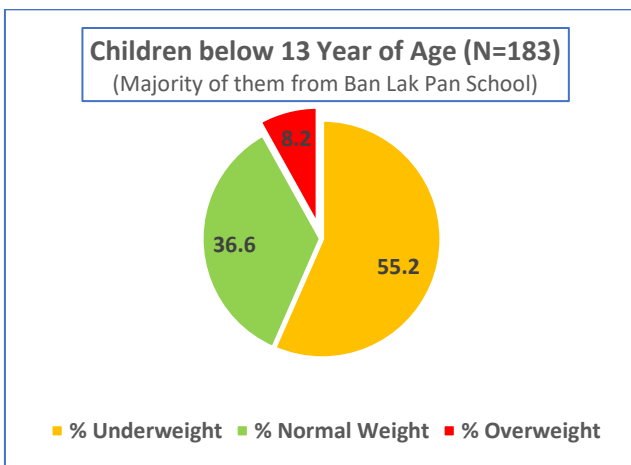
No.	School Name	Location	Gender	Surveyed	Other Characters
1.	Chalermprakret 48 Pansa School, Ton-Tong Tambon	Lamphun	Girls only	269	Boarding school for girls from poverty-stricken homes, orphans, abused girls and HIV/AIDS affected families.
2.	School for the Deaf	Chiang Mai	Mixed	152	Children with Hearing Problems.
3.	a. San Na Meng b. Ban Lak Pan	San Sai District	Mixed	81 106	High School & Junior School – rural area.
	Total			608	

As is required by the Education Department, each school measures heights and weights of all children and forward it to the central pool. However, it is not clear if any meaningful feedback is provided to the schools. Periodicity of measuring differs from school to school and from class to class. Schools have a designated person, usually a school nurse, for measuring and recording of the data. Some teachers use

this information and provide advice to children with weight problems and nutritional needs, but it is rather ad hoc.

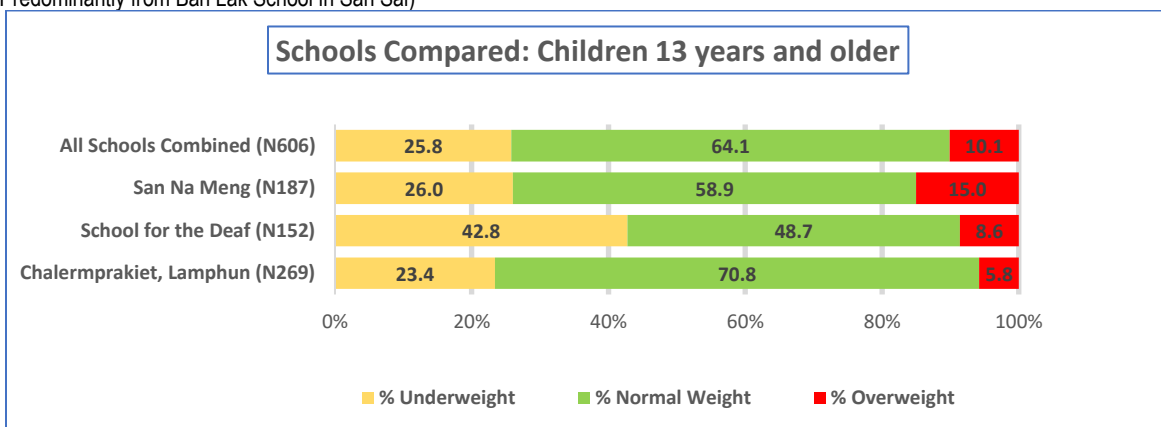
Schools store this data in Excel files, which makes it easy for the project team to obtain it for further analysis. Ranking children using body mass index (BMI) allows to list children as underweight or overweight. Schools are then advised to arrange for general discussions with students to interpret the data and address their concerns. Teacher’s involvement allows for discussions to explain the purpose of the program and provides an opportunity to answer their queries on growth and other health issues.

Following three charts summarize the under or overweight status of students. BMI is calculated to standardize heights and weights ($BMI = \text{Weight in Kg} \div \text{Height in Mts. squared (kg/mt}^2\text{)}$). Underweight is considered if the BMI is below 18.0; normal if BMI is between 18.0-24.9; overweight if it is 25.0-29.9 and a BMI of 30+ is considered obese. Since a significant number of children are below BMI 18, a category of BMI under 15 is considered as a case of severe undernutrition, for further assessment and advice (Data details in Annex 1).



All schools combined and children below 13Yr. old.
(Predominantly from Ban Lak School in San Sai)

All schools combined and children above 13Yr. old



Normal BMI ranged from 49-71% in Schools, highest in Chalermprakiet School (71%) and lowest in the School for the Deaf children (49%). Overweight averaged 10% in all school children surveyed, and ranged from 6% in Chalermprakiet school to 15% in San Na Meng school.

Children below 13 years show higher levels of undernutrition. Although most are stunted, almost half of them recover, as they grow older if given adequate food.

Comparing all schools surveyed, it is worth noting that supervised regular meals, as in Chalermprakit boarding school, results in highest level of normal weights and lowest numbers of under and overweight children, demonstrating that routine and supervised feeding programs can improve the health status of school children. Detailed data for each school is provided in Annex 1.

What have we learnt?

The two most important findings that have surfaced requiring health education from this work, are the number of school children falling under the categories of Underweight and Overweight.

First, more than one fourth of all children were found to be Underweight. The condition known as stunting, is largely attributable to poor and inadequate nutrition in early childhood. Weaning practices in children 6-36 months are woefully inadequate. Quality of food, the amount served at each feed and the frequency with which children are fed, requires urgent change. Poor quality of food makes the child's food intake deficient in proteins, calories and other nutrients. During this time, the child is dependent on adults for appropriate feeding. Poor weaning practices not only contributes to physical stunting, but it also affects potential intellectual development. Stunting is a permanent condition and the only solution is to educate teachers and students about the need for proper care of the under-fives for the future generations.

Secondly, the overweight problem among children is a serious and emerging health problem. Overweight and obesity is largely due to poor dietary habits and lack of physical activity. If not corrected, overweight and obesity becomes a huge problem in adulthood, as is demonstrated among teachers in these schools, where 41% of male and 32% of female teachers were found to be overweight or obese. Increasingly, obesity is being linked to a number of chronic diseases. Diabetes, hypertension, heart problems and even some cancers are associated with overweight and unhealthy lifestyle. Furthermore, expectant mothers, who are overweight or obese, experience disproportionate levels of complications of childbirth.

Helping teachers and the school children to understand through awareness and education is seen as the best way forward to minimize future health problems due to nutritional habits. A regular assistance to provide awareness in the schools can bring about some change. This opportunity also helps in promoting the discussions with the students, such as teenage pregnancy, reproductive health and other issues that may concern the young minds. The burden of NCDs has risen to a level which is frightening. It starts early in childhood because of poor dietary intake. Any improvements in the knowledge and attitudes of public will reduce this burden. Schools are the best place to start, where intellectual imprints are made for life.

The program helps the schools with continued support through periodic visits to sustain growth monitoring program among students and discussions with teachers and students on any aspect of health. Offer is also made to have a regular session with those who would wish to seek help and assistance in overcoming their weight problems. With assistance from the school managers, the project arranges group discussions among students about their health. A scheduled meetings with students are

advised to discuss the results and link it to the lifestyle and their dietary habits. Any questions from students are discussed for better understanding.

Great emphasis on drastic reduction of added sugars, salt, saturated fats, and not to exceed daily calorific needs. Advice on avoidance of indulging in junk food containing high levels of sugars and carbs is emphasized. Healthy eating plans include emphases on fruits, vegetables, whole grains, and milk. Children are advised to include a variety of protein foods such as legumes (beans and peas), soy products, fish, lean meats and poultry, eggs, nuts, and seeds.

Schools are assured of continued support if they find the program helpful. Teachers have expressed interest in the program and some teachers have suggested regular online zoom sessions with single or multiple school participations. The project has opened up opportunities for further dissemination of health education in schools, making tomorrow's generation health literate. It is an altruistic approach by those with knowledge-based resource to share, particularly to the vulnerable.

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Annex 1

Excel analysis of three Schools assessed during the period May 2022 to February 2023. Data details the BMI categories of Below Normal, Normal (Severe Underweight and Underweight), Normal, Overweight and Obese.

All Schools

All Children	BMI	No.	%	Girls	%	Boys	%	All (%)
S Underweight	<15	32	5.3	21	5.1	11	5.9	34.8%
Underweight	15-17.9	179	29.5	112	27.2	66	35.3	
Normal	18-24.9	345	56.9	255	61.9	83	44.4	56.9%
Overweight	25-29	42	6.9	20	4.9	22	11.8	8.3%
Obese (35+= 3)	30+	8	1.3	4	1.0	5	2.7	
Total		606		412		187		Incomplete data for 7

All <13 Year	BMI	ALL	%	All
S Underweight	<15	9	9.1	54.6%
Underweight	15-17.9	45	45.5	
Normal	18-24.9	33	33.3	33.3%
Overweight	25-29.9	8	8.1	12.1%
Obese	30+	4	4	
Total		99		

1. Chalermprakiet School, Lamphun (All Girls, 11-19 Yrs.)

Wt. Category	BMI	Girls	%	All	Age 13-19
S Underweight	<15	7	2.6	25.6%	23.3
Underweight	15-17.9	62	23.0		
Normal	18-24.9	187	69.5	69.5%	71.7
Overweight	25-29	12	4.5	4.8%	5.0
Obese	30+	1	0.4		
Total		269			

2. School for the Deaf

Wt. Category	BMI	All	%	Girls	%	Boys	%	All
S Underweight	<15	13	8.6	3	3.8	10	14.9	42.8%
Underweight	15-17.9	52	34.2	28	35.4	23	34.3	
Normal	18-24.9	74	48.7	37	46.8	31	46.3	48.7%
Overweight	25-29	12	7.9	11	13.9	2	3.0	8.6%
Obese	30+	1	0.7	0	0.0	1	1.5	
Total		152		79		67		

3. San Na Meng School

All SNM	BMI	ALL	%	Girls	%	Boys	%	All
S Underweight	<15	3	3.6	0	0.0	3	6.3	26.5%
Underweight	15-17.9	19	22.9	7	21.2	12	25.0	
Normal	18-24.9	49	59.0	19	57.6	27	56.3	59.0%
Overweight	25-29.9	10	12.0	4	12.1	6	12.5	14.5%
Obese	30+	2	2.4	3	9.1	0	0.0	
Total		83		33		48		

4. Ban Lak Pan School (age 8-15; 5 between 14-15)

All (7+)	BMI	ALL	%	Girls	%	Boys	%	All
S Underweight	<15	9	8.7	4	9.1	5	8.3	52.9%
Underweight	15-17.9	46	44.2	20	45.5	26	43.3	
Normal	18-24.9	73	35.6	18	40.9	19	31.7	35.6%
Overweight	25-29.9	8	7.7	2	4.5	6	10.0	11.5%
Obese	30+	4	3.8	0	0.0	4	6.7	
Total		104		44		60		

All Teachers						
	BMI	Female (%)	Male (%)	Total (%)	ALL	Remarks
Underweight	Below 18	3 (9.6)	0 (0)	3 (6.3)	6.3%	Only a borderline underweight
Normal	18-24.9	18 (58.1)	10 (58.8)	28 (58.3)	58.3%	Majority are with normal weight
Overweight	25-29.9	7 (22.6)	4 (23.5)	11 (22.9)	35.4%	All overweight combined: Females 32.3% and Male 41.2%
Obese	30-34.5	2 (6.4)	1 (5.9)	3 (6.3)		
Very Obese	35+	1 (3.2)	2 (11.8)	3 (6.3)		
Total		31	17	48	100%	

Data Analysis - Microsoft Excel