

## The Effectiveness of Nutrition Education Programme for Primary School Children

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### ABSTRACT

This study was conducted to determine changes in nutrition knowledge, attitude and practice of 8-year-old school children after receiving a nutrition education package. A total of 418 school children from urban and rural areas participated in this study. The intervention group consisted of 237 children while 181 children who did not receive the nutrition education package acted as controls. The nutrition education programme that was conducted for 3 weeks comprised of a video viewing session and a comic reading session followed by exercise questions as reinforcement for each session, and also classroom activities. Knowledge, attitude and practice questionnaires were distributed to the children before (pre-intervention) and after (post-intervention) receiving the nutrition education programme. A follow-up visit was conducted six months after the programme had elapsed. The results obtained indicated that the nutrition knowledge score increased significantly in the intervention group from  $48.3 \pm 13.2$  at pre-test to  $54.6 \pm 16.2$  in post-test and  $55.0 \pm 14.3$  in follow-up test ( $p < 0.05$ ). The nutrition attitude score also increased significantly from  $68.7 \pm 15.5$  at pre-intervention to  $72.6 \pm 15.0$  and  $74.7 \pm 15.8$  during post-test and follow-up test respectively ( $p < 0.05$ ). However, the nutrition practice score had no significant improvement in both groups throughout the study period. There were no significant changes in the control group in knowledge, attitude and practice scores at pre, post and follow-up tests. In conclusion, this study showed that a good nutrition education programme had a positive impact whereby better nutrition knowledge, attitude and healthy eating habits in children were seen. It is hoped that the improvements would be sustained throughout their lives.

## INTRODUCTION

Children are facing rapid development – mentally and physically – thus good nutrition is very important in this phase of life to ensure they grow normally and healthily. Eating habits in children are generally developed since young and usually will continue into adulthood (Kelder *et al.*, 1994; Krebs-Smith *et al.*, 1996; Auld *et al.*, 1998). Therefore, nutrition education should be conveyed to children from an early age.

The rapid change in socio-economic status among Malaysians has resulted in changes in lifestyle, including eating habits and food intake and consumerism. Changes in eating habits and leading sedentary or inactive lifestyles are known to be some of the factors contributing towards increasing prevalence of chronic diseases such as diabetes, cardiovascular diseases and hypertension in the populations (Ismail *et al.*, 2002).

The school has been identified as a suitable place to implement nutrition education programmes because it has a systematic environment (Kolbe, 1993; Auld *et al.*, 1998). Contento, Manning & Shannon (1992) cited that nutrition education in schools could improve children's eating habits. This is because school is a place where almost all children and adolescents can be reached and are gathered among their peers, besides having all the teaching facilities and expertise (Auld *et al.*, 1998; Willeford, Splett & Reicks, 2000). Inculcation of activities and exercises in the school that express the relationship between the children and food could bring about positive results that lead to the building of a healthy lifestyle (Moberg & Piper 1990) among the children. Matheson & Spranger (2001) suggested that educators should incorporate attractive and amusing activities in nutrition education programmes in order to create an enjoyable learning environment.

In Malaysia, the Ministry of Education in collaboration with the Ministry of Health has put into action programmes to promote and improve health and nutritional status among school children (Sahari, 1992). Examples of such programmes are the School Health Programme, School Health Education Programme, School Supplementary Feeding Programme and School Milk Programme. The Ministry of Education also has incorporated several topics related to nutrition and health into the science, and physical and health education syllabus. The aim is to help students to improve their knowledge, promote positive attitudes towards good health and nutrition and also to practice a healthy lifestyle (Ministry of Education Malaysia, 1998).

In this study the nutrition teaching media were produced in the form of a video and comic. The idea was to provide an alternative choice of teaching media in nutrition education at schools instead of using the usual textbook. The main objective of this study is to determine the effectiveness of a nutrition education programme implemented among primary school children. It is hoped that this programme will benefit the students and could help to improve their knowledge besides encouraging them to practice good eating habits in their daily lives.

## MATERIALS AND METHOD

### Study design

This study was organised in 2 phases. During the first phase, the teaching materials (video and comic) of the intervention programme were developed and tested, and the knowledge, attitude and practice (KAP) questionnaire was validated. In the second phase, an intervention was implemented for 2 consecutive weeks at the intervention schools. The control schools did not receive any intervention programme.

## **Study population**

A total of 418 Malay children, 204 boys and 214 girls aged 8 years old were recruited for this study. The children were divided into two groups, an intervention group (n=237) and control group (n=181). The study was conducted in four schools (2 urban and 2 rural areas). In each urban and rural area, one school served as the intervention school while the other one acted as control. The locations were Daerah Ulu Langat in Selangor and Wilayah Persekutuan Kuala Lumpur.

The study protocol was approved by the Research Ethical Committee of University Kebangsaan Malaysia. The official consent was obtained from the Ministry of Education for the school selection and the study activities in the selected schools. Written informed consent was obtained from the parents, and verbal consent was obtained from the children for the intervention activities and for all measurement procedures.

## **Intervention component**

A video and comic entitled 'Food Pyramid' were prepared specifically for this study and pre-tested before they were used as teaching materials in the classroom. Teaching sessions took place during the period of Physical and Health Education at school. The video viewing session was done during the first week. During the second week, the children were given a comic and were asked to read it together with their teacher in the classroom. Each activity was followed by exercise questions as enforcement. Group work also became part of the nutrition education programme in the third week, where children working in a group of 4 or 5 were asked to complete a food pyramid on a sheet of triangular cardboard. Only children from the intervention group received the nutrition education programme.

## **Evaluation of the programme**

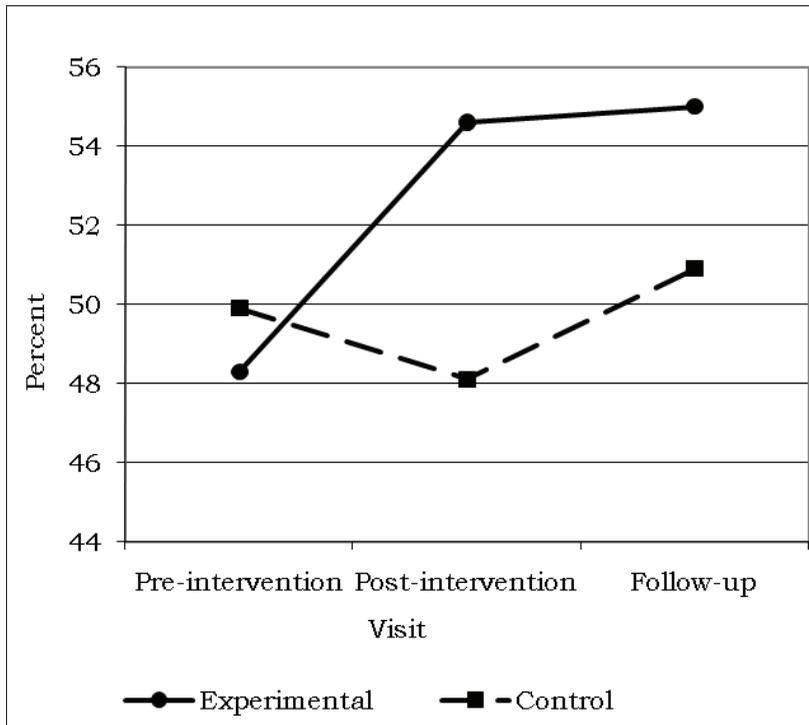
Before the study started, children and their parents were asked to complete a demographic questionnaire. A questionnaire comprising questions on nutrition knowledge, attitudes and practices (KAP) was administered to each child before they received the nutrition education programme and right after the programme was completed. Follow-up test was done using the same questionnaire six months after the programme elapsed. Changes in the KAP scores were used as the main parameter to determine the effectiveness of the nutrition education programme. The results were also compared between rural and urban areas. All data were analysed using SPSS programme version 11.05. The results were presented as mean and standard deviation. General Linear Model as well as t-tests was used in data interpretation.

## **RESULTS**

### **Changes in nutrition knowledge, attitude and practice before and after the programme**

#### *Changes in nutrition knowledge score*

Figure 1 shows the changes in nutrition knowledge score during the study period in both intervention and control groups. At pre-intervention, the nutrition knowledge in both intervention (48.3±13.2%) and control (49.9±12.7%) groups did not differ significantly ( $p>0.05$ ). The nutrition knowledge of the intervention group increased significantly at post intervention (54.6±16.2%) and follow-up visit (55.0±14.4%) as compared to the pre-intervention data. However, the changes in nutrition knowledge of the control group were not significant (Wilks Lambda=0.937,  $F=13.9$ ,  $p=0.00$ ) during the study period.



**Figure 1.** Changes in nutrition knowledge in the intervention and the control groups.

#### *Changes in nutrition attitude score*

This study found that there were no significant differences in the nutrition attitude score between the intervention ( $68.7 \pm 15.5\%$ ) and the control group ( $68.3 \pm 14.5\%$ ) at the beginning of the study (figure 2). The nutrition attitude score in the intervention group increased significantly to  $72.6 \pm 15.0\%$  at post intervention and  $74.7 \pm 15.8\%$  at the follow-up visit (Wilks Lambda=0.970,  $F=6.4$ ,  $p=0.002$ ). However, no significant changes occurred in the control group during the study period.

#### *Changes in nutrition practices score*

Figure 3 shows the mean of the nutrition practices score in both intervention and control groups. This study found that at the beginning of the study, the nutrition

practices score among the children in the intervention group was slightly higher ( $64.6 \pm 16.3$ ) as compared to the control group ( $62.0 \pm 14.5$ ). However, the changes of the nutrition practices score in both groups were not significantly different throughout the study period (Wilks Lambda=0.994,  $F=1.166$ ,  $p=0.313$ ).

#### **Changes in nutrition knowledge, attitude and practice score among the children in the intervention group according to the study areas**

Figure 4 shows the changes in nutrition knowledge among the children in the intervention group in urban and rural areas. At post intervention, nutrition knowledge of the children in urban area increased significantly ( $56.3 \pm 16.0\%$ ) as compared to the children in the rural area ( $51.3 \pm 16.1\%$ ). The nutrition knowledge of

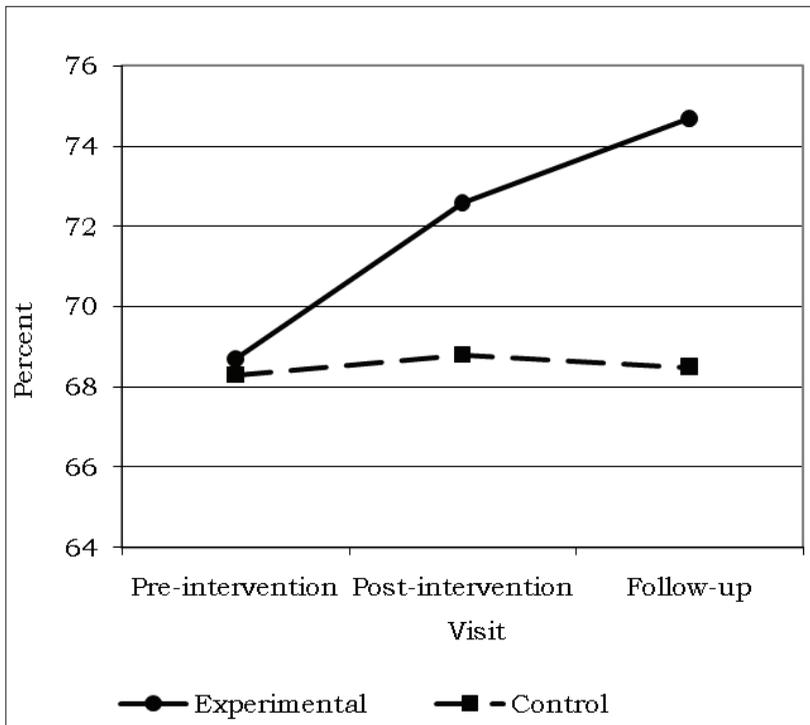


Figure 2. Changes in nutrition attitudes in the intervention and control groups.

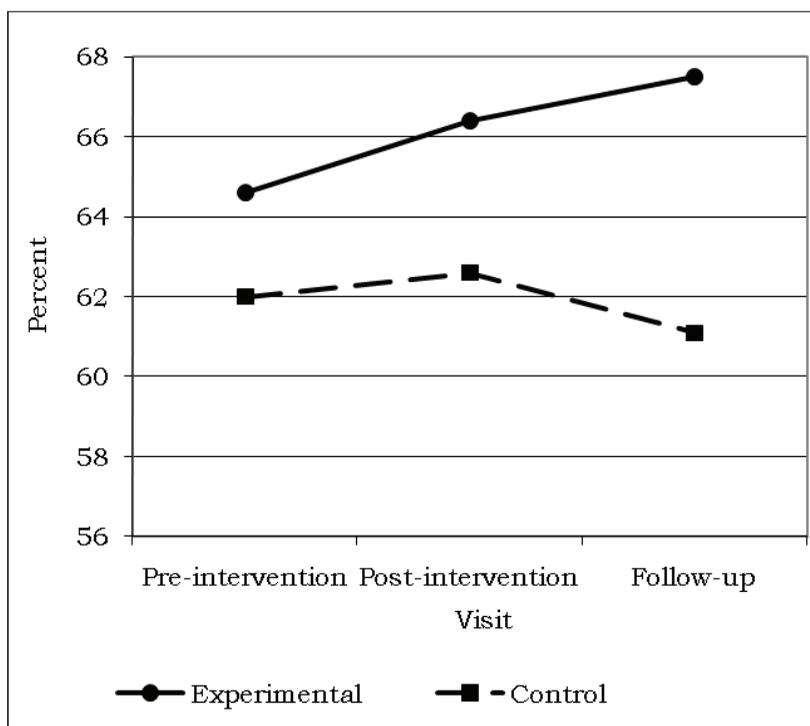


Figure 3. Changes in nutrition practices score in the intervention and the control groups.

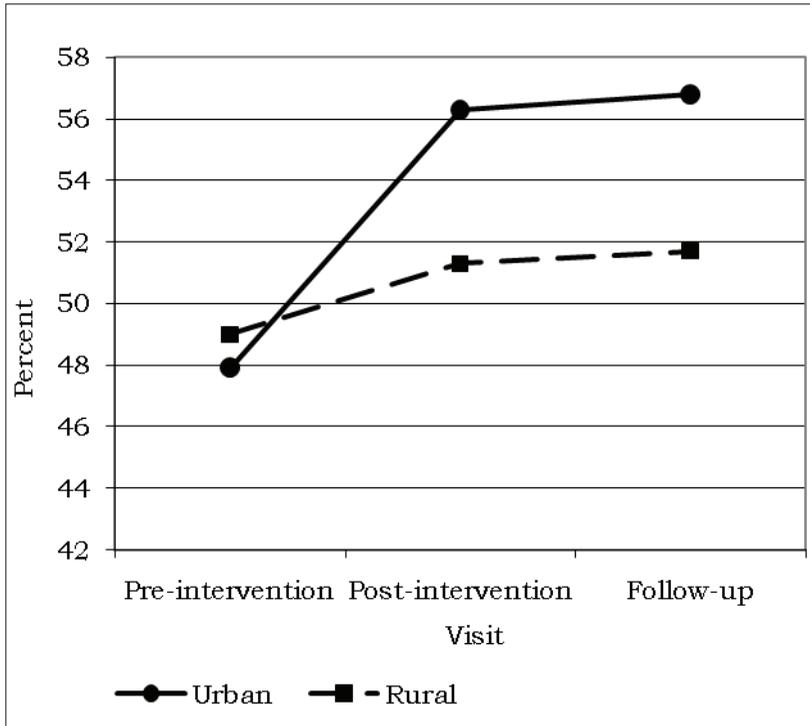


Figure 4. Changes in nutrition knowledge in the intervention group according to area.

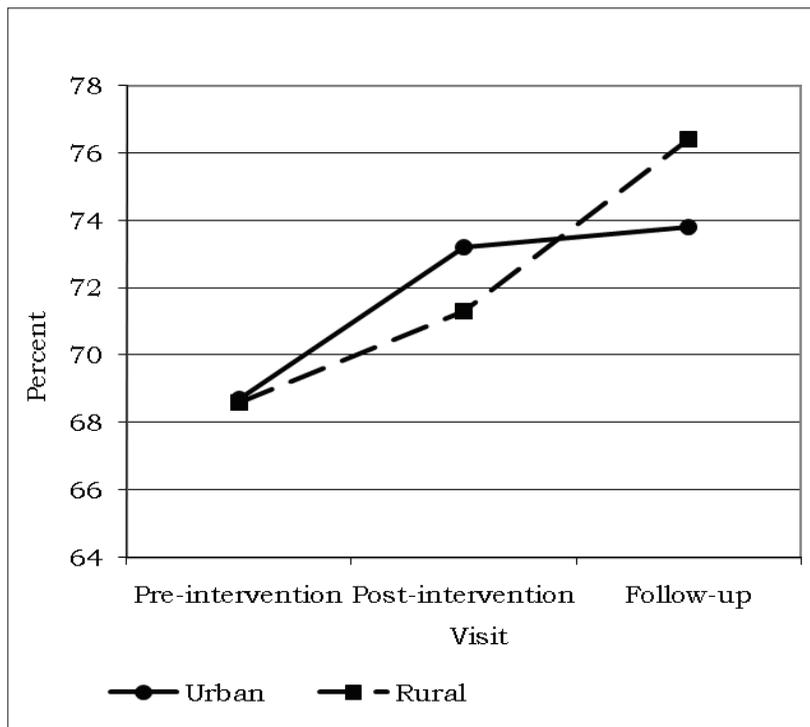


Figure 5. Changes in nutrition attitude score in the intervention group according to area.

the children in urban areas increased further ( $p < 0.05$ ) during the follow-up visit ( $56.8 \pm 13.8\%$ ) as compared to the rural areas ( $51.7 \pm 14.8\%$ ). In addition, the increase of the nutrition knowledge score among children in urban areas was higher as compared to rural areas throughout the study period (Wilks Lambda=0.863,  $F=18.6$ ,  $p=0.00$ ).

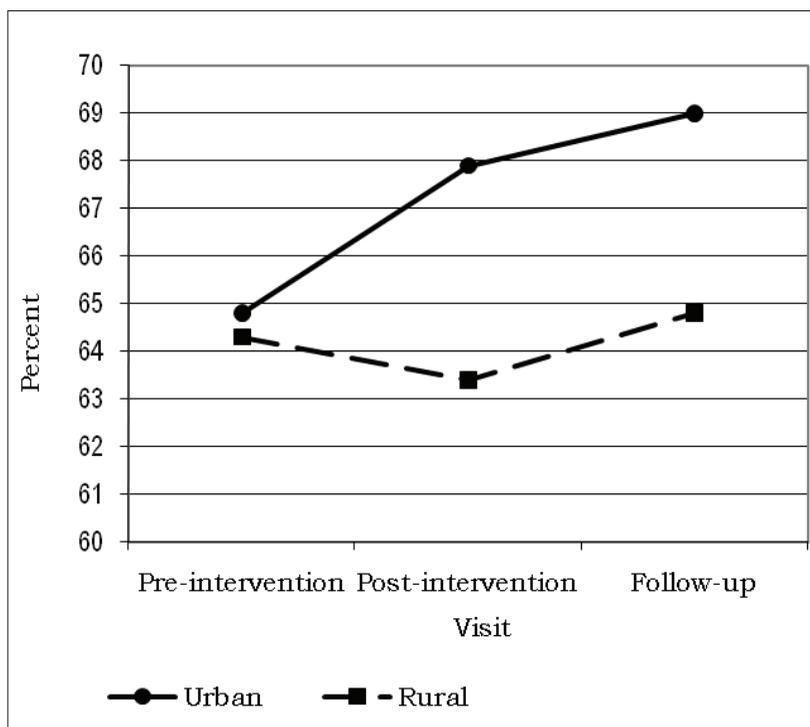
The study also found that there was significant increase (Wilks Lambda=0.906,  $F=12.204$ ,  $p=0.000$ ) in the nutrition attitude score among the children in both urban and rural areas throughout the study period as compared to the pre-intervention data. Even though the score in the rural areas was higher compared to the urban areas at the follow-up visit, there were no significant differences ( $p > 0.005$ ) between urban and rural areas (Figure 5).

The changes in the nutrition practices score in both groups (figure 6) were not significant at post-intervention and

follow-up visit as compared to the pre-intervention (Wilks Lambda=0.981,  $F=2.236$ ,  $p=0.109$ ). The statistical analysis showed that the scores were not significantly different ( $p > 0.05$ ) between the urban and the rural groups too.

## DISCUSSION

School-based nutrition education programmes can play an important role in promoting healthy lifestyles and diets among students, as well as teachers. A nutrition programme that successfully promotes and inculcates healthy eating habits as well as active lifestyles in children and adolescents could not only prevent them from chronic diseases and early death, but also reduce healthcare cost and enhance their quality of life (CDC, 1996). CDC (1996) suggested that nutrition education programmes need to focus as well on steps to prevent children and adolescents from developing these



**Figure 6.** Changes in nutrition practices score in the intervention group according to area.

chronic diseases throughout their lives. This is because some of the physiological processes that lead to certain chronic diseases are associated with unhealthy eating habits during childhood. Unhealthy eating habits in children usually continue until adulthood (Kelder *et al.*, 1994). Subsequently, it is very important to educate children and instil them with healthy eating habits during early childhood because eating habits are difficult to change in adulthood after they have been practised for a long period of time.

The nutrition education programme conducted in this study enhanced the nutrition knowledge, attitude and practices of the target group. However, the nutrition knowledge and attitude scores were more apparent compared to the nutrition practices. This study also found that there was a significant difference in overall KAP score between the intervention and control groups. However, the increment of nutrition practice was significant among children in urban areas as compared to rural areas. This result was because children in urban areas were more exposed to nutrition information and they already had self motivation, thus found it easier to accept and understand the information delivered in the programme.

Earlier studies involving nutrition education also reported that nutrition education programmes could improve nutrition knowledge and attitude significantly, as well as improving the eating habits or practices among the children (Contento, Balch & Bronner, 1995; Contento, Manning & Shannon, 1992). Perez-Rodrigo & Aracenta (1997) suggested that effective nutrition education should focus on the initiative to increase nutrition knowledge, as well as to establish positive dietary habits and practices. A study by Ruzita *et al.* (2000) in Kuala Lumpur showed that nutrition knowledge among overweight schoolchildren can be improved by means of nutrition education programmes. Willeford, Splett & Reicks (2000) reported

that in his study, the implementation of a teaching curriculum called *The Great Grow Along* has shown significant changes in nutrition knowledge and attitude in schoolchildren. As a consequence, 75% of the children have changed or are planning to change their food choices. On the other hand, as mentioned earlier, a study done by Ruzita *et al.* (2000) using a video package and incorporated with activities such as singing and exercise programmes have improved nutrition knowledge among overweight and obese schoolchildren. These examples show that a well-planned nutrition education programme can be an excellent medium to teach children on nutrition and healthy lifestyle topics.

Although much research on nutrition education has not acquired a strong correlation between nutrition knowledge and practices, some researchers reported that nutrition knowledge can at least change the eating habits (Worsley, 2002). For example, Wardle, Parmenter & Waller (2000) reported that nutrition knowledge has a significant correlation with healthy eating habits such as fruits and vegetables intake. He also discovered that individuals with knowledge are 25 times more likely to include fruits and vegetables in their diet compared to those with less or no knowledge on nutrition. However, Ruzita *et al.* (2000) pointed out that an increase in the understanding and knowledge concerning nutritional concepts does not necessarily bring positive changes in making healthy food choices. This is because people need extra periods of time to change their food choices and eating habits.

In the present study, even though the average score for nutrition knowledge had increased, there are not many changes in the practice score. The short intervention period may be one of the factors that contribute to the few changes observed in their eating habits or practices. Besides, children's eating habits are always influenced by other factors especially food

availability at home, family socioeconomic status as well as mothers who prepare food for the family (Crockett & Sims 1995). On the other hand, programmes that focus on changing certain habits such as fat intake and fruits and vegetables intake, together with suitable evaluation and implementation methods, could offer positive impact towards nutrition practices. In addition, the type of questionnaires administered as well as statistic tests used play an important part in obtaining good correlation between individual nutrition knowledge and their practices (Wardle, Parmenter & Waller, 2000).

## CONCLUSION

This study has shown that a well planned nutrition education programme could improve nutrition knowledge and promote positive changes in attitudes and practices towards good nutrition. In addition, the usage of educational media such as comics and videos in this programme may attract children's attention to learn and understand better nutrition. This programme could be a nationwide model for nutrition education and promotion programmes in the school setting in Malaysia. By implementing the programme in schools, it will give a positive impact by inculcating good nutrition knowledge, attitude and healthy eating habits in Malaysian children, and that hopefully will persist throughout their lives

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