

ORIGINAL ARTICLE

MANAGING OBESITY IN MALAYSIAN SCHOOLS: ARE WE DOING THE RIGHT STRATEGIES?

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ABSTRACT

The evolution in lifestyle and dietary habits of the Malaysian people that have taken place over the last few decades can be largely attributed to both family and social environment. These factors are known to affect the nutritional status of the community, in both children and adults. Reduced physical activity and changes in their diet have been one of the contributing factors to the rising prevalence of overweight and obesity. However, in Malaysia, in which nutrition transition has been a norm, it is worrying when the trends of overweight and obesity have been rising steadily over the years especially among children. Although numerous strategies to control obesity in Malaysia have been taking place, many had shown little effect. Analysing strategies implemented at national level is thus crucial in order to ascertain reasons for the shortfalls of these strategies especially among children. Obesity most commonly begins as early as the ages of 5 and 6 years, or during adolescence. Obesity is indeed a major public health concern due to its huge negative impact on the society at large which is well supported by evidence-based literatures. Managing this issue is complex and holistic approach is thus crucial in reducing its incidence and prevalence.

Keyword: Childhood obesity, Schools, Malaysia, Strategies.

INTRODUCTION

Positive economic transition has led to 'westernization' of lifestyle leading to a rapid increase in prevalence and incidence of obesity in this country. This current situation has imposed a heavy burden on the health care system and lowered the quality of life among obese subjects. Hence, a comprehensive and well-understood national strategy among all major stakeholders is required to tackle this problem.

Despite efforts taken by international organizations, national governments and community level funded intervention in promoting awareness and measures to prevent and control obesity, the prevalence continues to rise. Overweight and obesity are responsible for 5% of global mortality¹. Obesity epidemic have an impact on the nation social and economic status. In view of public health effects on obesity, and its rising trends, intervention of obesity remains important.

Studies have shown that children between the ages of 10 to 13 who are overweight has an 80 percent chance of becoming obese adults unless they adopt and maintain healthier range of body weights. Several studies have also shown that childhood obesity will continue towards adolescence and adulthood obesity².

Managing obesity among school students is one of the main aims of the Ministry of Health as obesity has raised potential health burden in the country. As two different terms are commonly used, overweight is defined as BMI above the 85th percentile to 95th percentile for the age and sex. A child is said to be obese only when the weight is of at least 10 percent higher than what is recommended for their height and body type. On the other hand, obesity in adults is defined as BMI above 95th percentile for the age and sex.

The aim of this paper is to highlight the major findings related to obesity among schoolchildren. Secondly, this paper discusses the policies and strategies to tackle childhood obesity in Malaysia. Finally, this article studies the trend of obesity using various sources of data.

Prevalence of obesity among children globally

In 2005 to 2006, Health Behaviour School-aged Children survey by Currie (2008)³ was carried out in 36 countries and this survey has found that the prevalence of overweight and obese among adolescence was 5-25%. The prevalence of overweight is higher among the boys (16%) compared to girls (12%). The finding was similar and supported by a study by Ogden et al (2014)⁴, although more than half of all United States

adolescents are overweight in which 19% were obese.

Similar findings from the National Health and Nutritional Examination Survey (NHANES) carried out in the United States, also showed an alarming prevalence of overweight and obesity even among younger children. Between NHANES I (1971-1974) and NHANES II (1976-1980) there were not many changes. However, between NHANES III (1988-1994) and NHANES IV (1999-2000), there is an upward trajectory of obesity for all ages and gender groups. Recent NHANES 2011-2012 data recorded prevalence of obesity of 16.9% in youth and 34.9% in adults. The overall prevalence of obesity among youth remained unchanged compared with that in 2009-2010, and there was no significant change since 2003-2004⁴.

WHO estimated that there were 40 million or 6% of world population of preschool children who were overweight. Looking at the global trend of obesity among children it is projected that the prevalence will continue to become worse⁵.

In 2010, WHO ranked Malaysia as the sixth country in Asia with the highest prevalence of obesity. WHO data showed 60% Malaysians were overweight. What is more worrying is that 38% of them were children⁵. According to Priya (2010)⁶ there was an increase in obesity in Malaysia i.e. 6.6% for the children aged 7 and 13.9% for the children aged 10 years old.

There is a huge concern in which some researches had suggested that Asians may have more body fat than Caucasians. BMI hence is not a perfect tool to measure body fat composition although both were correlated. According to Flegal et al. (2010)⁷ BMI does not account for differences in body fat distribution with differences between race, sex and age. This means that two people may have the same BMI reading but in reality the composition of body fat differs. Asian has more body fat than Caucasians thus the morbidity and mortality risk is higher among Asians. WHO expert has recommended lower cut-offs for Asians as points for public health action⁸.

Determinants of childhood obesity

- Ethnicity and Gender

The prevalence of obesity varies by place of origin and race. Hispanic children are 2.6 times overweight than non-Hispanic origin⁹. In America the prevalence was higher among the Black than the non-Hispanic. Boys were at higher risk of being overweight than girls. It is 17.8%, 16.4% and 22% in non-Hispanic white boys, non-Hispanic black boys and Mexican origin boys respectively, as compared to lower prevalence for girls i.e. 14.8%, 23.8% and

16.2% for non-Hispanic white girls, non-Hispanic black girls and Mexican origin girls respectively. NHANES 2011-2012 had similar findings of Hispanic origin being at higher risk. The prevalence of overweight and obesity is 22.4% Hispanic origin, 20.2% non-Hispanic, 14.1% non-Hispanic white and 8.6% non-Hispanic Asian⁴.

In a separate study conducted by Ismail et al. in 2002¹⁰, found that the prevalence of obesity is higher among Malaysian women in comparison with their male counterpart. Among the women, Indians are the most followed by the Chinese, Malays and the aborigines. However, among the male, Chinese men were the most obese followed by the Malays, Indians and the aborigines. Fat intakes were the highest among Chinese for both men and women.

Gender and cultural background thus play a significant role in identifying the potential group who are at risk. Intervention specifically targeting this area is necessary in order to reduce the prevalence and incidence of obesity.

- Genes

Children are likely to be overweight when the parents are overweight. Scientists have identified the gene, which is responsible in predisposing the child to be obese. The variation of genes being responsible for obesity is around 50% to 90%¹¹. However not all overweight children have overweight parents. It was reported that 30% of obese children are with normal parents¹¹. Genetic factor may play a role but certainly environmental factors which trigger the obesity onset may play similar functions.

- Socioeconomic

In general, members from family of lower socioeconomic category were at higher risk of overweight than those from family of higher income group and the lower middle income earners were the fastest growing group to be obese¹².

This scenario can be explained as due to budget constraint, the parents were more likely to purchase cheaper food which is usually low in nutritious value and high in saturated fat and other components which predisposes them to obesity. It becomes worst as the cost of living is escalating each year which affects the food security scenario of the population indirectly.

- Emotion

Undiagnosed feeling of depression, hopelessness, anger, boredom or low self-esteem among the school children influence eating habits that causes

over eating and being overweight. The emotional instability could be due to family conflict, peer pressure and other relevant factors.

- **Environment and Dietary Trends**

Physical inactivity has been identified as the fourth leading risk factor for global mortality which contributes to 6% of deaths globally ¹. It is further stressed that lifestyle such as overeating and inactivity had been an important environmental determinants ¹³ that may lead to physical inactivity.

Parental restriction of certain food or force food choice leads to over consumption of restricted food and obesity in later life. In 2012, a study carried out by Mohd Nasir et al. ¹⁴ among 1933 preschoolers in Peninsular Malaysia, found that 33% of parents had good knowledge on nutrition, 39% were satisfactory and 28% had poor knowledge. He further stressed that dinner (18%) is the most frequently skipped meal followed by breakfast (16%). Balance diet at consistent regular interval is needed for the wellbeing and health of the children

- **Medical Illnesses**

Certain medical illness such as endocrine and neurological problems increases the susceptibility of the child towards other diseases. Furthermore the medication such as steroids taken for treatment and management of specific illness precipitate overweight problems. The percentage is still very low but it is indeed a concern that needs to be addressed.

School-based interventions in managing childhood obesity

Few studies had showed that intervention in schools were able to reduce weight problems in school children. A randomized control trial by Gortmaker et al. (2001)¹⁵ carried out a field trial with 5 intervention and 5 control schools among a group of 1295 ethnically diverse grade 6 and 7 students from public schools in 4 Massachusetts communities. The outcomes were assessed using pre-intervention and follow-up measures, including prevalence, incidence and remission of obesity. The result showed that the prevalence of obesity among these school children decreased, indicating a promising school-based approach that can reduce obesity among youth.

Another interventional study by Singh et al. (2009)¹⁶ found that a randomized controlled trial carried out among 1108 Dutch adolescents who were enrolled into an interdisciplinary program with an adapted curriculum for 11 lessons in

biology and physical education as well as environmental change options, had beneficial effects on the sum of skin fold thickness measurements in girls and consumption of sugar-containing beverages in both boys and girls during the short and long term intervention.

In Malaysia, Wafa et al. (2011)¹⁷ carried out a randomized controlled trials among 107 obese children aged 7 to 11 year old school children in Kuala Lumpur. In this study the intervention which involved an eight hour contact over a period of 26 weeks (on a group of children) were aimed at changing the children's sedentary behavior, physical activity, and diet, using behavior change counseling. Results showed that weight gain was reduced significantly in the intervention group compared to the control group. Changes in health related quality of life, measured physical activity and sedentary behavior favored the intervention group. They concluded that treatment was associated with reduced rate of weight gain, and improvements in physical activity and quality of life with more substantial benefits may require longer term and more intensive interventions.

Guidelines and strategies to tackle childhood obesity in Malaysia

Many guidelines had been developed in this country that aim to reduce the prevalence of overweight and obesity among the community. Below are the summaries of guidelines and strategies involved directly and indirectly in managing obesity among the population especially children in Malaysia:

- I. Global Strategy on Diet, Physical Activity and Health 2004
- II. Action Plan for the Global Strategy for the Prevention and Control of Non-Communicable Disease 2008
- III. Aerobic Exercise Programme
- IV. 'Weight Control Intervention' Programme: Diet, Exercise and Physical Activities
- V. Obesity Prevention plus Parenting Support
- VI. Planet Health' Programme: Diet and Physical Activities
- VII. Jom Mama Initiatives
- VIII. Guideline on Marketing of Food and Drinks for Children
- IX. Guideline on Enforcement of the Prohibition of Selling Food and Drinks outside the School Premise
- X. Outline on the Management of a Healthy Canteen
- XI. One Child One Sport
- XII. Obesity Awareness Campaign Program 2008
- XIII. The Active and Productive Community Programme

- XIV. Guideline on the Implementation of Healthy Food and Drinks in the Government Service
- XV. Servings of Healthy Food during Meeting
- XVI. 10,000 Steps a Day
- XVII. Clinical Practice Guideline Management of Obesity 2004
- XVIII. My Body Fit and Fabulous (My BFF)
- XIX. National Strategic Plan (NSPNCD 2010-2014)

The strategies above focus on approaching the children in a holistic manner. It comprises on recommendation for reasonable weight-loss, dietary management, intensity and type of physical activities, behavioral modification, family involvement and clinical diagnosis of medical condition which predispose them to obesity. The above strategies are divided mainly focusing at work place, school base and community setting. This component is mainly aimed on improving understanding, better effectiveness and help to develop new modalities for interventions in overcoming obesity.

Data Analysis

The initial population data on child health among children in this country is obtained from the School Health Unit. Also known as KSK, the data are sent from each state and compiled at the ministry level. These data monitors the health screening activities among the pupils in Year 1, Year 6 and Form 3. Generally, the health activities involve immunization, health education and home visit for children.

In 2007, upgraded version of KSK data collection was introduced replacing the manually collected data. Particularly, the form which was related to school children obesity is called "KSK 201A pind. 2/2007". Data on their nutritional status was measured by the school health team and children who were underweight, overweight and obese category were further referred to nearest government health clinic for further management. Variables that were used were in accordance to variables used by WHO 2007 BMI Weight for Age to diagnose any children with non-optimal BMI value.

From the year 2007 to 2008, there was a sharp rise in prevalence of obesity among the year 1, year 6 and form 1. This could be due to more serious emphasis given by the Ministry of Health (MOH), Malaysia in detecting children with obesity in schools through the implementation of new guidelines and computerized method in data

collection. This is also caused by the replacement of CDC Growth Chart 2001 to WHO 2007 BMI Weight for Age, which had higher sensitivity in detecting children who were obese.

CDC Growth Chart 2001 which was used prior to this had low sensitivity in detecting children who were obese among Asian country as the scale was based on population sample from western countries who had superior physical body frame compared to Asians. Due to these reasons, the WHO 2007 BMI Weight for Age was adapted by the Ministry of Health. This new scale was drawn based on population of Asians children who have lower cut of points and thus has higher sensitivity in identifying obese children. If the former chart were to be used, the prevalence from 2008 to 2013 may show similar levels without any significant changes.

The prevalence of obesity among Year 1 was the lowest when compared to children from Year 6 and Form 3. The figure ranged from 4.5% to 6% as shown in the table above. The highest prevalence rate was at Year 6, which ranged from 7.5% to 9.5%. This may be due to the behaviour pattern of children at the age of 12 years old. This period signified their maturity and independence, thus choosing what they want and spend their pocket money on unhealthy food. Addiction to certain behaviour such as video games may lead to sedentary lifestyle and predispose them to obesity.

At Form 3, the prevalence was lower when compared to pupil from Year 6 i.e. from 5.4% to 7.4%. This drop may be due to the fact that as they grow, increase in height relatively decreased the BMI value. An adolescent often can maintain their weight during the growth period but once they have achieved their final height, excessive fat must be shed off in order to obtain the optimum body weight and composition. However the BMI calculation only indicates the body ratio in terms of height and weight but does not measure the fat composition or total muscle mass in the body which may give inaccurate estimation on children who are obese.

When comparing the pupil in Year 1 in 2007 as oppose to Year 6 in the year 2012, the prevalence showed an increase rate. Similar increases in prevalence rate were shown when Year 6 pupils in 2007 were compared to Form 3 students in 2010. Although many factors need to be taken into consideration when comparing both age groups these figures was alarming and children tend to be more obese when they grow older.

The graphs below describes further on the trend of obesity among the school children in Malaysia.

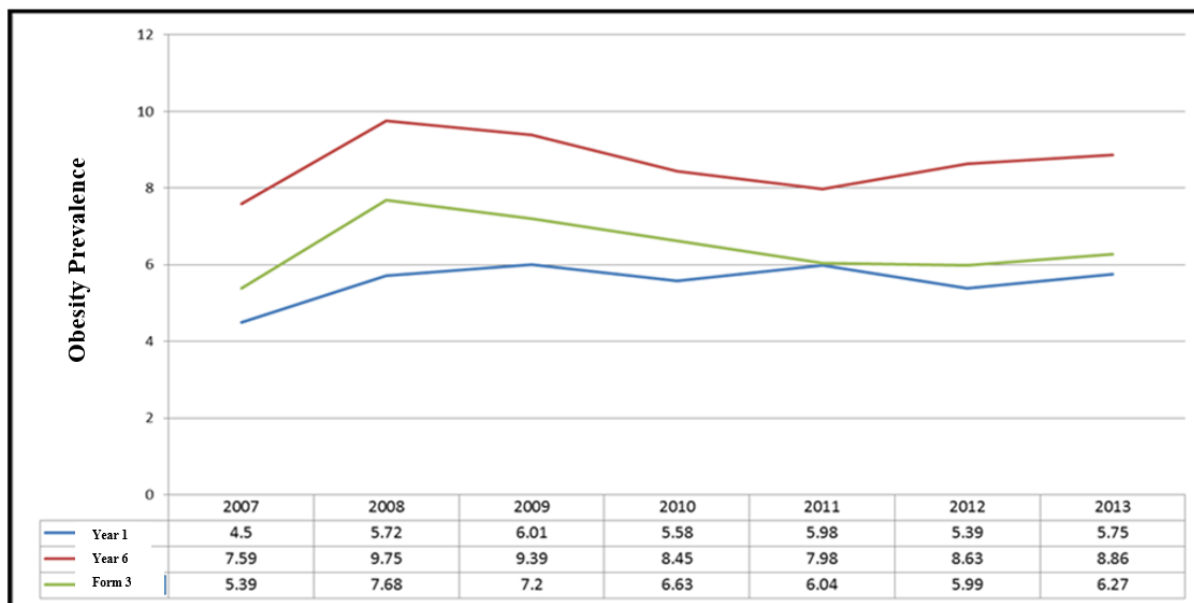


Figure 1 Obesity detection trend among pupil in Malaysia in Year 1, Year 6 and Form 3 for the year 2007 to 2013 (adopted from KSK Reten 2014 pind. 2/2007, School Health Unit, Ministry of Health, Malaysia).

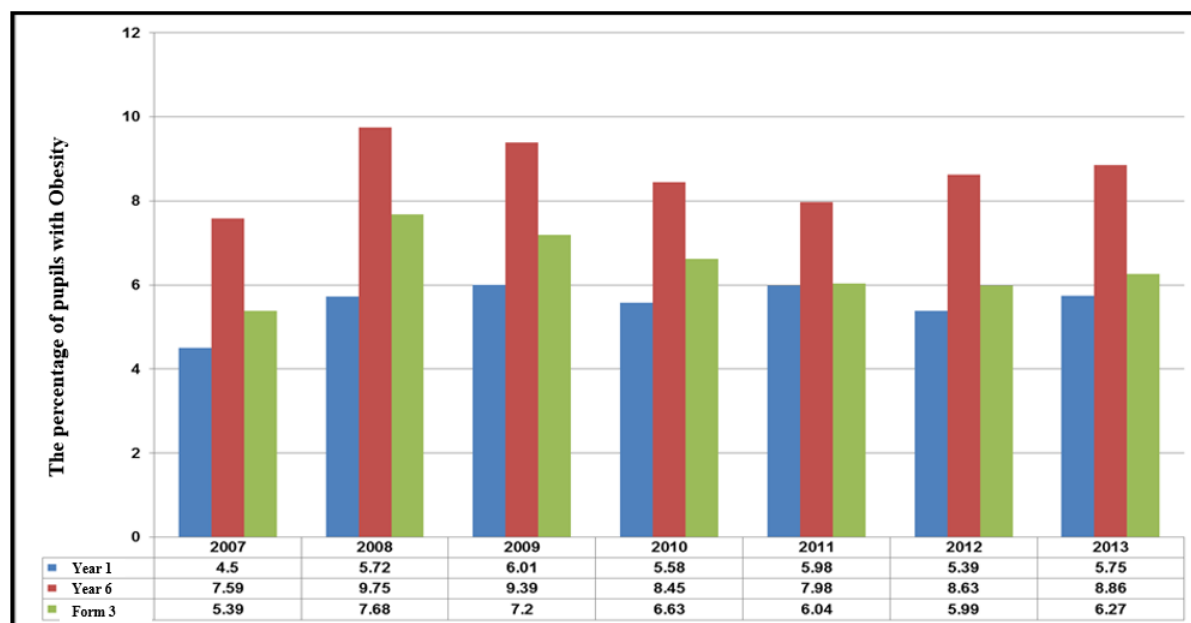


Figure 2 Comparison of prevalence of obesity among pupil in Year 1, Year 6 and Form 3 for the year 2007 to 2013 (adopted from KSK Reten 2014 pind. 2/2007, School Health Unit, Ministry of Health, Malaysia).

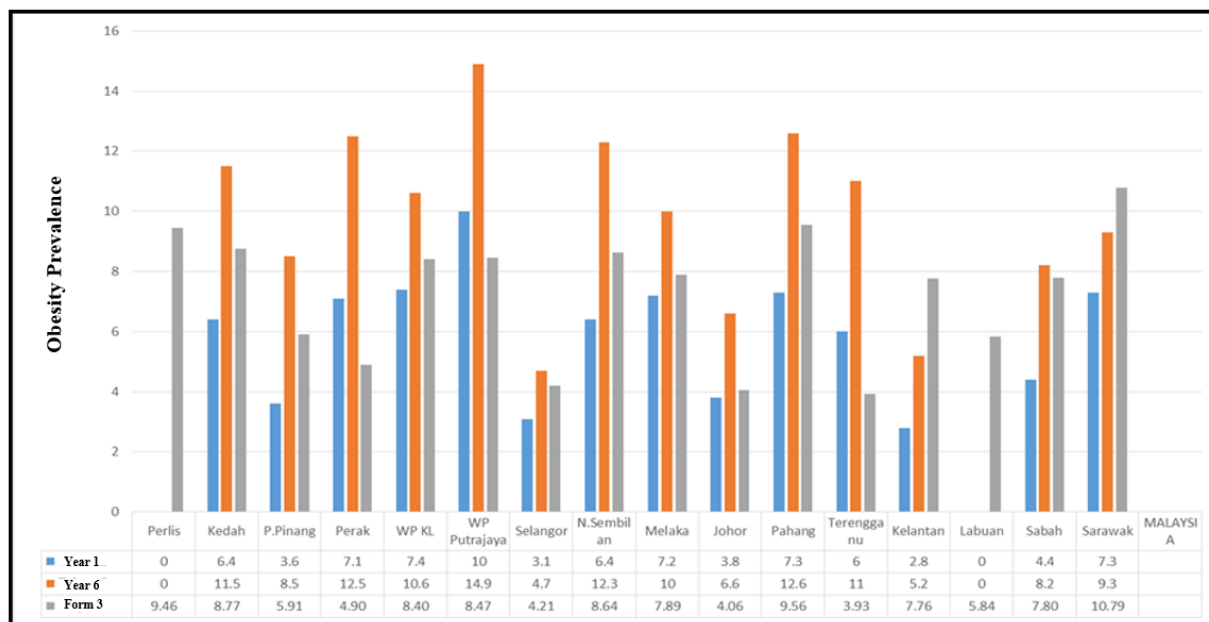


Figure 3 Comparison of prevalence of obesity among pupil in Year 1, Year 6 and Form 3 for the month of January to June 2014 (adopted from KSK Reten 201A pind. 2/2007, School Health Unit, Ministry of Health, Malaysia).

In the above graph there is an increase in percentage of obese children as they grow older in Kelantan and Sarawak. However there is no obvious differences in obesity prevalence between the high and low income states which gives us a brief understanding that obesity in children is a problem that is, beyond social and economic background.

Presentation of findings in fourth National Health Morbidity Survey (NHMS) 2011¹⁸ highlighted that the overall national prevalence of obesity was 6.1% among the children from the age group of 13 to 18 years old. Although the percentage was smaller due to narrower age group, the impact of health on the individual and the society on the whole is tremendous. Therefore the need of continued efforts of all stakeholders including non-governmental agencies is crucial in improving the status of growth of Malaysian children.

Issues and Challenges

- Guidelines & strategies

Numerous guidelines and strategies have been implemented to manage obesity among children in Malaysia. This illustrates the seriousness of government agencies such as Family Health Division, Ministry of Health in controlling the problem. Monitoring and evaluating each of this strategy is overwhelming. Few of the strategies might overlap with each other which may create unwanted confusion among staffs from different government agencies. There is also a possibility of neglecting certain programs due to shortage of

staffs which might affect the continuity of these programs. This can be overcome by restructuring current available strategies and guidelines into a comprehensive single form of module which may offer a more promising result. Approaching it via the principal of supply chain management might be the answer.

Supply chain management is created by Michael Porter in 1985¹⁹. This is a powerful analysis tool for strategic planning in a system of organizations, people, activities, information and resources involved in moving a product or service from supplier to customer. Supply chain management is the design and management of processes across organizational boundaries with the goal of matching supply and demand in the most cost effective way.

It is suggested that the Ministry of Health must be able to recognize that managing obesity among children in Malaysian School is an important avenue to ensure that all children are physically and mentally active.

In terms of inbound logistics, these are the processes related to receiving, storing and distributing inputs internally. The surveillance system in identifying all affected children must be standardized among all in order to avoid any discrepancy in data that is collected. The collected data must be reliable and valid as it is the key factor in creating value operations, and the transformational activities may change the input into outputs which are then sold to customer. Therefore, upon analysing the data,

strategies are formulated and introduced to the clients, whom are the students.

On the other hand, the outbound logistics is considered as the formulated product in the form of strategies, guidelines and activities and delivered to the end client which are the students. With attractive marketing and sales method, the aim is to attract other potential stakeholders to venture together with one aim i.e. reducing obesity among the school children as well as effective health promotion strategies to be taken place. The benefits of services that are being offered should also be well conveyed to the consumers. Finally, service which we are provided via the team from School Health Unit must be well maintained and value added services must be given regularly to the school children.

Once the primary components are well strengthened, it is much easier to manage the component from other support activities. This is because with solid plan and strategic approach, advantages are there to be negotiated and thus obtain adequate budget to support the infrastructure involved, while expanding the human capital through evidence based public health policy and research. Well managed financial aspect during procurement, minimizes wastage and create value for money in every expenditure.

As these two activities are simultaneously managed, the margin of success will widened and vice versa. Through supply chain management, the complexity of all the components can be summarized through a single diagram for better understanding. To improve further, this system must be managed by one single body or Task Force to combat the problem of obesity. Autonomous power should be given to them to manage and so that budget is directly channelled to this team. This is to avoid any overlapping of programs with similar objectives and such powerful body can obtain necessary recognitions in order to attract more funds externally. Knowledge from experts from abroad can be disseminated to this team which comprises local experts from various fields in order to propose a holistic approach in managing obesity among children.

- Monitoring

To monitor and implement programs to such magnitude inquires regular monitoring the troubleshooting. Inadequate man power can affect the expected outcome due to irregular monitoring and implementation. This is because; the school health team conducts medical examinations among students only twice a year in the same school and with such routine it is tough to educate the students on healthy lifestyle. It is recommended

that one staff who is well versed with health in every school to provide continuous monitoring on implemented policies related to managing obesity among children. Nurses and dieticians are some examples of human resource that should be readily available for the schools in providing such services.

The Ministry of Health can also consider on outsourcing certain components related to managing obesity among school children. This is also part of the supply chain management, in moving some of the internal activities and decisions to outside providers. Coaching the identified obese school children in reducing their fat or effective health education regarding weight management among the children, teachers and the parents can also be carried out.

- Inadequate research and development

More researches need to be conducted in areas such as to evaluate the nutrition gaps in the existing curriculum (i.e. preschool, primary, secondary and higher education), to determine the effective methods in promoting food intake and dietary practices, to identify training needs and tools to promote healthy eating, to identify enabling factors in management and maintenance of normal body weight, to determine behaviour modification in management and maintenance of normal body weight and to identify the genes and the environment interaction which may influence the development of overweight and obesity among children in Malaysia. Study on whether the clinical practice guideline is being adhered to by the health practitioners also needs to be carried out in order to identify potential weaknesses which can be further rectified.

- Less involvement of parents in co-managing children with obesity

Parents should be empowered to be involved in each school to formulate activities and attendance of parents should be made compulsory during these programs. This is to reduce the attitude of solely depending on the teachers only for grooming their children.

CONCLUSION

All relevant strategies should be in place. Of late, the awareness and action plan has been intensified after recognizing that obesity in children is actually a serious public health concerned. More time is needed for these strategies to be established as most of it is still at an early stage. Meanwhile, relevant authorities should strengthened the epidemiological understanding among the stakeholders, continue to develop and evaluate appropriate intervention strategies

accordingly and via effective surveillance as well as to enhance the delivery system in reducing the prevalence and incidence of obesity among schoolchildren.

It is already known that all relevant strategies are already in place. What is of more concern now is the emphasis in strengthening these strategies as childhood obesity is in reality a serious problem. More time is needed to ensure that these recommendations and strategies are in place as they are still in the early phases. Relevant authorities have the duty to strengthen the epidemiological understanding among the stakeholders as well as to continue to develop and evaluate appropriate intervention strategies accordingly. Effective surveillance is also needed to monitor the increasing incidence of childhood obesity among the Malaysian children.

RECOMMENDATIONS

The current practice in school is to measure the BMI during each current year and the progress in measurement in student's subsequent years are absent. As an example the progress of the children who were measured in year 2007 is unknown as in the 2008, different group of students were being evaluated. Follow up cohort evaluation must be implemented in monitoring the trend of obesity among pupil in Year 1, Year 6 and Form 3.

Award incentives and other recognitions should also be allocated for schools that have shown promising results in lowering the prevalence of obesity among their students with independent effort. Many new innovative ideas can be obtained, as this institution will carry out new interventions to control these problems. Parents must also be informed that it is an offence if their children are obese. Introduction the element of fear among parents might produce positive result in reducing the incidence of obesity among schoolchildren.

Every state in Malaysia should send the compiled raw data to Ministry of Health rather than only written reports. Prior to that, all the necessary variables that are included in these reports should be in accordance to literature reviews. This is to enable Ministry of Health to process the raw data statistically in order to find out significant variables. These results can also be generalized to all population well designed method has been used throughout the data collection process. Secondary data are prone to have errors and biases and these biases can be controlled if new information is primarily extracted from the raw data.

Conflicts of interest

The authors declare no conflicts of interest

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