



# Childhood Weight Management for School Health Nurses and School Children in Malaysia: A conceptual framework

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## Abstract

In developing an effective Childhood weight management, it needs to be based on a theory. The Social Cognitive theory (SCT) and Urie Bronfenbrenner model with integrated Kolb's model of Learning Styles and Experiential Learning is used in this study to modify and make changes to the personal factor influences such as knowledge, attitude and expectations, behavior modification and environmental influences among overweight and obese school children. The aim of this study is to provide a new model for the professional development role of the nurses in the School Health Program (SHP) and health education promotion towards obese school children to improve their quality of life. Furthermore, in this study SHP and future health education and promotion are integrated with the role of SHN to facilitate the effective management of childhood obesity.

Keywords: obesity; school children; school nurses; conceptual framework; weight management

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## 1.0 Introduction

Nurses are a group of paramedics in the health care setting besides a doctor. Among the role of nurses is to contribute to the health and welfare of society. The Code of Professional Conduct of Malaysia has stated that a nurse must play their role to afford care to the individual, families, and communities (Nursing Board Malaysia, 1998). This guideline portrays several roles of nurses such as to provide care through protection and promotion, prevention of illness such as communicable disease and non-communicable disease, restoration of health for rehabilitation and recovery phase and alleviation of suffering from chronic or acute related to the disease process. Furthermore, nursing services in the health care setting of Malaysia are in primary care and secondary care (hospital). In primary care, the nursing services are through the Family Health Program (FHP), Maternal and Child Health Clinic and School Health Program (SHP) (Sirajoon & Hematram, 2008).

The SHP in Malaysia managed by the School Health Team (SHT) including School Health Nurses (SHN) and Medical Officers. The SHT provides the service to the school and school children aged 7 to 12 years old for primary school and 13 to 15 years old for secondary school under the Malaysian Ministry of Education. The core services of SHT include screening and physical examination, monitor nutrition status, early detection for abuse and neglect and risk behaviour (Yadav, Chan & Lan, 2019). Therefore, the role of SHN in the SHP can be divided into the five core nursing activities and care (Sirajoon & Hematram, 2008):

- Preparing pre-visit plans to the school
- Health appraisal on the school children such as assessing the health status and screening (height, weight, BMI and BP), physical examination, health history, observation, vision test, and hearing test
- Health education for problems that have been identified or common issues related to the school children
- Provide minor and emergency treatment
- Health care referral and care coordination

## 1.2 Role of the School Health Nurse (SHN) in Malaysia

The SHN plays a vital role in the prevention and treatment of obesity among school children as a front liner when involving current health issues among school children in Malaysia. The nursing care and activities such as screening the school children for height, weight and Body Mass Index (BMI), physical examination from head to toe, health education related to obesity problems, and monitoring health problems to prevent complications from obesity. Based on the "*Garis Panduan Perkhidmatan Kesihatan Sekolah*" by the *Unit Kesihatan Sekolah, Cawangan Kesihatan Keluarga, Bahagian Pembangunan Kesihatan Keluarga, Jabatan Kesihatan Awam, Kementerian Kesihatan Malaysia*" (2013), it was stated that the SHN are required to give advice or health education if they identify an obesity problem based on the Growth Chart WHO 2007 (BMI for age) of school children and are needed to monitor the obese school children for six months and refer to a doctor and *Pegawai Sains Pemakanan* for the further management. However, until now, the standard guidelines with structured

health education are not available for SHN in Malaysia. This has erected a barrier for the SHN to deliver effective health education because they are not well-trained in delivering health education related to nutrition, physical activity, exercise, and childhood obesity management for the obese school children. The school nurses should have the knowledge and expertise to promote the prevention of overweight and obesity and address the needs of overweight and obese youth in the schools (American Nurse Association School Nurse (AHASN); 2014, Powell, et al, 2018). This supports the notion that the SHN in Malaysia need guidelines or health education modules on the nutrition, physical activity and obesity prevention for childhood weight management to help them deliver effective health education as part of on-going strategies of preventing obesity and other related roles as SHN. In addition, to ensure that obesity prevention or intervention could transfer successfully, innovative approaches are needed and must be based on theory, intervention component, stakeholder involvement, and adequately measured results (Tucker & Lanningham-Foster, 2015).

Besides that, the role of the SHN in the prevention and interventions for obese school children is not fully developed and is unable to properly place the role of SHN efficiently in the context of Malaysia. Therefore, SHN plays an important role in the SHT and SHP in providing the main services of immunisation and health examination including monitoring and detecting obese school children (*Garis Panduan Perkhidmatan Sekolah*, 2013). Furthermore, SHN has a limited time to play their role as an educator in the SHP and there is an insufficient amount of studies related to the effects involving the role of SHN in the SHP in Malaysia. In addition, a lack of empirical study related to school-based intervention on the prevention and childhood weight management means insufficient evidence exists involving the SHN in the context of Malaysia. Meanwhile, previous studies also demonstrated some barriers and inconsistencies in the implementation to educate, communicate and provide services related to the prevention of obesity and practicing a healthy lifestyle for the children and families (Schroeder, Travers, & Smaldone, 2016). This supports that research is needed to further illuminate and efficiently leverage the specific roles for school nurses in obesity prevention and intervention.

A systematic review suggests that SHN can play a key role in implementing sustainable, effective school-based obesity interventions (Schroeder, Travers, & Smaldone, 2016). In addition, the obesity prevention programme is obligatory to continue because several school-based interventions may be dismissed when the intervention has been completed (Schey et al., 2016). According to the American Heart Association (2014), a school nurse plays a key role in preventing obesity because they are more knowledgeable, have the ability to find resources and create the partnership with the community organization to promote a healthy lifestyle for children and their families. The school-based interventions that involve nurses are effective and may better suit for obesity prevention where the healthy habits education or counselling are deemed more appropriate for all children with different body weight (Schey et al., 2016).

### **1.3 Prevalence of Obesity**

In Malaysia, the prevalence of overweight and obesity continues to rise incrementally

especially for children below 18 years old. The Report on the National Health and Morbidity survey in 2015 (NHMS) stated that the prevalence of obesity among children aged seven years old decreased from 14% to 8.3%. However, the prevalence of overweight and obesity for children 10 to 17 years old increased to 25% in the year 2015 as compared to 11.2% in the year 2011 and it was slightly higher among children in the urban areas at 12.1% than in the rural regions with 11.2% and significant among boys at about 13.6% as compared to girls with only 10.0%.

The obesity problem can cause significant complications for the children such as poor health quality of life (HQOL), internalizing disorders, Periodontal Disease, poor school performance, Altered Pre-pubertal Hormones and Attention-Deficit Hyperactivity Disorder in children (Pulgeron et al., 2013). All these problems require secondary prevention to treat the disease to avoid mortality and morbidity involving the children. The medical cost for treating the complication resulting from the obesity problem of school children is significant and may cause a significant financial burden to the economy for the first five years of primary school (Döring, Mayer, Rasmussen, & Sonntag, 2016). Meanwhile, the primary care prevention or intervention is less costly and more effective in improving health behaviours and directly reduces the economic burden to costs for treatment due to prevention from the complications (Wright et al., 2014).

As a conclusion, the development of the prevention programme or module to address the issue of obesity and to reduce the number of overweight and obesity among school children through the primary prevention is more effective rather than the cost for the treatment. Thus, reach agreement to the previous study by Hoque, Megat, Ahmad, Razak, and Afiq (2016) asserted the importance to implement more programme at the primary level to promote healthy eating that can engage students in learning and practicing these healthy behaviours. For that reason, the purpose of this study is to develop the Health Education Module (HEM) on childhood weight management for SHN in Malaysia that can be used in the SHP. This paper will be showing the predicted model that will be use in this study.

## **2.0 The aim**

This study aims to develop and evaluate the Health Education Module (HEM) on childhood weight management for SHN towards obese school children in Malaysia. Also, this study aims to evaluate the effects of the module (pilot study phases) to the knowledge, attitude, practice behaviour, and self-regulation among obese school children. At the same time, this study is interested in examining the effects of the module to the BMI, Blood Pressure (BP) and body fat of obese school children. Besides that, this study will firstly determine the attitude, practice, and barrier of health education on childhood weight management by SHN followed by evaluating the nutrition and physical status among obese school children before the module will be developed.

### **3.0 Literature Review**

#### **3.1 Role of School Health Nurses worldwide**

The alarming rate of childhood obesity necessitates preventive measures against this problem from becoming a reality either worldwide or in Malaysia. According to the United States Department of Health and Human Services (USDHHS, 2014), school nurses can play a major role to ensure that the goals of the Healthy People 2020 plan are achieved to improve nutrition and weight status among children. This statement asserts the vital role of the SHN in nutrition education and prevention of obesity. Some of the questions highlighted, "How the nurses can play a role in combating obesity?". The SHN can assess the socioeconomic status such as education status, housing and career to the child's and family's and then make recommendations to the families on how they can change their current lifestyle habits. Akin to the report by the CDC (Centre for Disease Control and Prevention, 2014) and World Health Organization, (2014) which informed that children from low socioeconomic status risk contribution to the prevalence of overweight and obesity among children. Based on these statements, it stands to reason that nurses play a significant role in educating school children about general health, healthy eating, and physical activity. In Malaysia, this role was stated in the *Garis Panduan Perkhidmatan Sekolah* (Panduan et al., 2013). However, when sufficient time and staff are not allocated or made a priority by the institution, the nurse may be unable to carry out the teaching programme that will aid in reversing obesity prevalence in the school system (Pelletier, 2015).

For this reason, the SHN needs a specific program or module, besides having to be more creative in the delivery of health education or obesity education, for the message to be delivered effectively and efficiently. Furthermore, the current practice of giving health education as daily a nursing activity needs to prioritise nursing intervention, as well as not just doing it due to the job description. The obesity problem of school children needs to be managed carefully to avoid stigmatisation of their personal image and mental stress related to obesity, including the teacher in the school and parent as well (Callie et al., 2015). Also, for this reason, the SHN need to ensure that, before implementing the educational module, they must assess the interest level of the school children. If there is a lack of interest and motivation to listen and be engaged in health teaching, the health education will not meet the outcome as planned (Pelletier, 2015).

As a conclusion, the literature review has reported that SHN can make an impact on students and families through education practices and partnerships with school personnel to reduce childhood obesity with different approaches in order to meet the unique learning needs and interests of the students and families. Various methods can be used by SHN such as online tutorial, group discussion, games activities, demonstration and lectures to guide the school children and their families in combating obesity in Malaysia (CDC, 2018). Other than that, SHN can be utilized to conduct effective interventions to improve in the school's overall health status and a reduction in childhood obesity.

### **4.0 Conceptual Framework Intervention HEM**

The awareness programme regarding health such as obesity has commonly used the

television, electronic media, and newspaper (Bromer, 2004). Besides that, in practice, health clinics in urban and rural areas also provide pamphlets that contains healthy food and physical activity. However, these methods are still unable to educate the parents and children about the importance of practicing a healthy lifestyle to prevent obesity. Therefore, the community also lacks awareness about practicing healthy lifestyle in their daily life (Conteno, 2011), such as practicing consuming healthy food and doing physical activities (Nixon et al., 2012). Meanwhile, to develop an effective educational module in combating obesity problem, it needs to be based on a theory. Social Cognitive theory (SCT) and Urie Bronfenbrenner model will be used in this study to develop the conceptual framework to certify the effectiveness of the educational module.

#### **4.1 Existing Theoretical Conceptual module**

A literature review showed that there is a lack of theoretical, conceptual modules that use a combination between Urie Bronfenbrenner model by Bronfenbrenner (1994) and Social Cognitive Theory (SCT) by Bandura (2001) for the development of a model on childhood weight management. A previous study in other countries has adapted several models that are suitable to be used in the module or program from the aspects of objective, target population, component in the program or module, and the intervention that will be induced to the population. The literature also showed that several models of theories have been adapted such as Social Cognitive theory (Manios et al., 2002), Social Learning theory (Warren et al., 2003; Bayer et al., 2009), combination of Social Cognitive theory and Social Learning theory (Nixon et al., 2012), health education model (Reilley et al. 2006), and socioecology concept (Kriemler et al., 2010). Based on that, the development of the module or program should be based on theoretical concepts as a guide to the development of the module or program. In the context of the development of health education for SHN in Malaysia for childhood obesity management is still questionable and needs to be examined.

The development of the intervention in the HEM of this study proposes to use the combination between Social Cognitive Theory (SCT) and Urie Bronfenbrenner model with an emphasis on action and make a change on the knowledge, attitude and expectations, and behavioural modification. Furthermore, to ensure that HEM is effective, this study also used Kolb's model of Learning Styles and Experiential Learning (Kolb, 2014). Kolb's model suggests that each session of learning activities must address each learning style following sequence: concrete experience, observations and reflections, the formation of abstract concepts and generalizations, and testing the implications of concepts in new situations for the environmental influences (Kolb, 1984). Besides that, the SCT describes the interaction between thoughts, behavior, and environment. It also explains how the individual engages between environment and sociocultural factors to produce behavioral effects. SCT stresses that personal behavior includes the self-regulation, self-efficacy, and self-evaluation in the learning process.

Furthermore, the Urie Bronfenbrenner model focuses on the microsystem which refers to the pattern activity, social roles, and interpersonal relationships with a primary focus on the environment around school children that will influence the growth and development among them related to their daily learning (Bronfenbrenner, 1994). Meanwhile, the mesosystem

refers to the relationship between individuals and environments such as the environment of the school, family, and nurses. Thus, it shows that the importance of a combination of theories in the intervention for the HEM to make changes to the knowledge, practice behavior attitude and self-regulation among obese school children.

Figure 1 explains how the integration between that theory and SHN prevention together with the involvement of parents to change the attitude, practice behaviour, self-regulation and increased the level of knowledge among obese school children. The previous study reported that school-based health education provided an opportunity to discover the best way to influence positive-health-related change for the youth to achieve the goal in health (Jalloh, 2007). Besides that, health education in schools aims to help the students to make changes and maintain healthy behavior (Joint Committee on National Health Education Standards (JCNHES, 2007). The delivery methods for the educational module are appropriate for the school children when it addresses the school children's cognitive, emotional and social development by using Kolb's model of Learning Styles and Experiential Learning. This model suggests that individual differences in the way them understanding. Normally, children will learn their experiences of and adaptation to the world and these variances can be placed on a continuum of perception (Kolb, 2014). Meanwhile, the effective involvement of SHN in the school health education has been proven to be able to help parents and children to avoid complications in addressing problems through discussion related to monitoring weight control, healthy eating and physical activity (Pelletier, 2015).

## **5.0 Methodology**

### **5.1 Study design**

This study will employ an experimental design with two groups: intervention and control. A school categorised as an intervention group will receive the HEM to evaluate the effects of the module in the pre and post. Meanwhile, a school in the control group will evaluate pre and post-test without implementation of the module. The Consolidated Standard Reporting Trials (CONSORT) flow diagram was used for an outline of the design (Schulz, Altman, & Moher, 2010).

### **5.2 Study setting**

The study setting for this study will be a primary school in the state of Selangor. Selangor has been chosen as the study setting because it has a higher population number of 188,501 primary school children as compared to other states (National Health and Morbidity Survey, 2015). This higher population number will increase the prevalence of obesity if prevention is not taken. Another reason is that the logistics factor is accessible for the researcher to monitor and collect the data of this study.

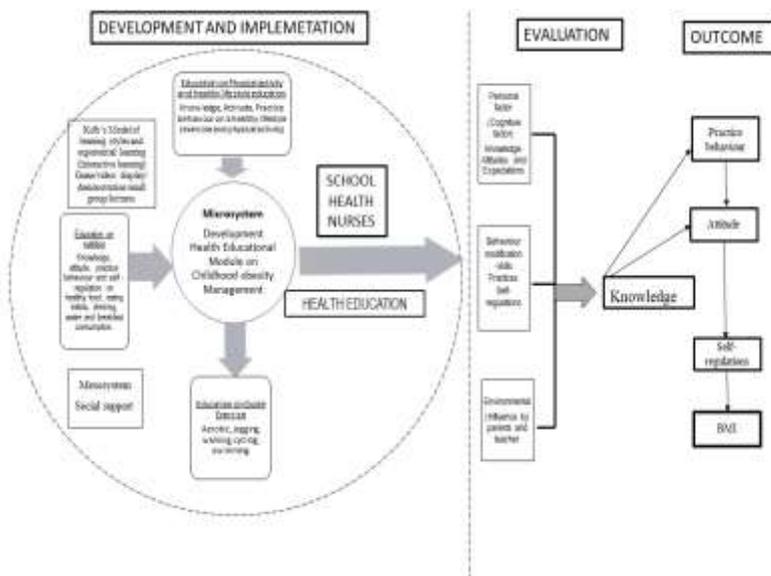


Figure 1: A conceptual framework of the development and evaluation of HEM for SHN on nutrition, physical activity, exercise and healthy lifestyle towards obesity among primary school children in Malaysia

### 5.3 The characteristic of participants

The population for this study is school children from the primary school in Selangor. The school children who will be enrolled in the study is from level one aged 7 to 9 years old and level two aged 10 to 12 years old.

### 5.4 Determination of sample size

The sample consists of primary school children from primary schools. The pilot study to evaluate the effect of HEM, the minimum sample size required for the testing is calculated to be 60 participants (Thivel et al., 2011) or 30 participants per group after considering a 20% dropout rate.

### 5.5 Sampling method procedure

A multistage probability sampling will be applied in this study with an independent person, who is not involved in this study, asked to carry out the randomization procedure. From the simple random sampling, Selangor was chosen as the location of this study. The primary school that will be involved in this study will be chosen by using simple random sampling. Also, the primary school children that will be involved in this study will be selected through purposive sampling who are identified to be obese and have agreed to participate in this study.

## 5.6 Pilot Study

A pilot study of HEM is to examine the reliability of the module to determine the homogenous population together after obtaining the responses from the experts.

The aims of implementing and evaluating the pilot study is to develop and test the adequacy of the HEM before it can be used for the future study or actual implementation as shown in Figure 2. This implementation of the pilot study will help the researcher to develop a final draft of the material and questionnaire carefully based on the comments from the content experts and feedback from the primary school children. It will be recorded to help in modifying the design and content of the educational module before actual implementation. Besides that, the researcher will provide the Continued Nursing Education (CNE) to the SHN before the actual health education of the educational module. This will help the SHN to deliver HEM effectively.

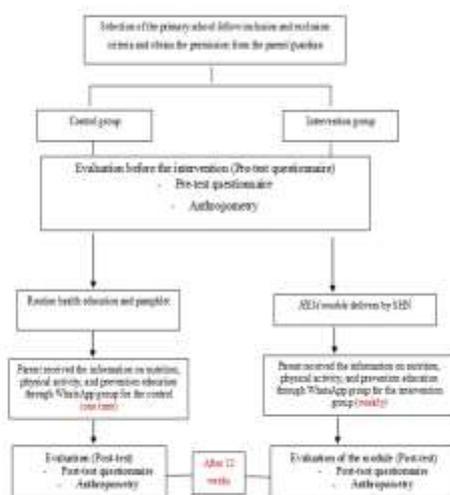


Figure 2: Flow chart for the planning of the pilot study HEM

## 6.0 The Future Outcome of the Study

Malaysia has implemented the *Program Bersepadu Sekolah Sihat* (PBSS) or Integrated School Health Program (ISHP) (Ahmad Husairi, 2014) to provide a healthy school environment. However, 28.2% of the students have never heard about the programme. This shows the importance of clarity to the students about the program running at the school to ensure there are an active participante (Hoque et al., 2016). Thus, the result of this study will show that SHN is an important role to support the prevention of obesity in school beside

nutritionists.

Meanwhile, SHN in Malaysia also need to provide education or advice to the overweight and obese school children but, at the same time, how they are able to provide education on prevention is still questionable. This is different in other countries such as the United States and the United Kingdom, where the SHN plays an important role in the prevention and treatment of the overweight and obesity. Since this study integrates the role of nurses, it is necessary to identify the current practice of SHN in delivering health education or advice on nutrition to the school children. The information from the findings of this study may contribute to the managerial data especially for the development of the professional role of nurses in the SHP in school. Besides that, it will provide baseline information for the Malaysian Ministry of Health and Malaysian Ministry of Education for future health education and promotion that integrates the role of nurses effectively to facilitate health awareness among primary school children and parents towards obesity prevention.

## **7.0 Ethical Consideration**

The ethical approval will be obtained from the UiTM Research Ethics Committee, National Medical Research Register, and the Ministry of the Education and *Jabatan Pendidikan Negeri Selangor*. The parents and respondent will be explained the study topic before consent taking. In order to assist the parents and respondent in understanding the reasons for the study, the information sheet and consent form will be written in two languages; Malays and English.

## **8.0 Conclusion**

The theoretical conceptual framework is compulsory to identify the correct research method and methodology in developing a suitable HEM and reliable tool to evaluate the effects of the HEM to the obese school children from the aspect knowledge, attitude, practice behavior and self-regulation, including the BMI. Furthermore, it is proposed that the data evaluation that will indirectly improve data quality. Therefore, more research should be carried out especially in Malaysia as this study could only provide baseline data and methodology for future research. Besides that, the issue related to obesity is not a new epidemic but has been a worldwide and global problem. Prevention is better than cure is one of the steps that can be applied to prevent obesity among school children. The SHN will able to play an important role in the prevention of obesity because they are a front liner in the health care system in Malaysia. It is hoped that, later on, this study will contribute to the future development of the professional role of nurses in schools and to improve the quality of life as well as to provide environmental support to the school children.

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