International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2016): 79.57 | Impact Factor (2017): 7.296

Development and Evaluation of a Physical Activity Educational Bookletfor Adolescents

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Abstract: ***Prevalence of obesity among adolescents has been increasing in the past decade with decrease in physical activity (PA) level. Education booklet is an effective approach that can be employed to educate and motivate public to get involved in PA. Present study aimed to develop PA booklet for adolescents, and to evaluate the content validity of the booklet. Five experts performed the content validation. Present study was conducted in two stages: booklet development, and content validation by five expert panels. The booklet contains of five topics which is introduction to PA, PA recommendations, health risk of obesity, barriers of PA and safety during exercise. The PA booklet was validated. However, improvements in the booklet was proposed by the experts, which were accepted and modified for the final version of the material. In conclusion, the booklet was validated using content validity and can be used to improve PA knowledge of adolescents.***

Keywords: Physical activity, Education, Booklet, Adolescent

1. Introduction

Over the past decade, the leading causes of death in the world had shifted from infectious to chronic diseases. There are strong evidences showed that lack of physical activity (PA) was important predictor for some chronic diseases including obesity and cardiovascular disease [1, 2]. Moreover, some longitudinal studies indicated that the PA levels during adolescence were associated with their disease risk in adulthood [3, 4]. These studies suggested that improving PA, fitness and weight status are beneficial to their health status in the future.

According to the Peninsular Malaysia survey II year 2007-2008 that had been conducted, the prevalence of overweight and obesity among school children aged 6-12 years was increased from 20.7% in 2002 to 26.4% in 2008 [5]. Low levels of physical activity have been linked to obesity in children [6]. A recent follow up nation-wide survey of school children reported that the children were generally sedentary [7]. This study suggests that intervention to increase physical activity in schools and the community should be implemented to prevent the trend towards increasing prevalence of overweight and obesity over the long term.

Whether obese adolescents are less physically active or less physically fit than their non-obese peers remains controversial. Many studies have reported a negative association between physical activity levels and adiposity [8, 9], whereas others have indicated no differences in physical activity between obese and normal-weight youth [10, 11]. Increasing physical activity is one of the key elements in the treatment of childhood obesity [12].

Intervention programmes that are focused on physical activity [13] has been proven to improve the body compositions of overweight and obese adolescents. Education module is an effective approaches to educate and motivate children and adolescents to get involved in physical activity in an intervention programme[14]. To date, there is lack of education modules that focus on physical activity in Malaysia. The existing education modules are mainly developed by the Ministry of Health Malaysia and their focus are on dietary intake changes. Thus, there is a need to develop an education module that focus on physical activity in order to overcome the increasing prevalence of overweight and obesity among adolescents. Present study aimed to develop and evaluate the acceptability of an education module on physical activity for overweight and obese adolescents.

2. Methodology

There were two phases in present study. Phase one was development of the physical activity (PA) education booklet. Extensive literature on booklet development was reviewed and discussed among the research team members.Our research team members consisted of nutritionist, dietitian and nurse. In the development process of the educational material, Ministry of Health documents, such as PA pyramid, PA modules were referred to get more ideas.Face-to-face meetings and comprehensive discussion sessions among the research team members were held to select the most suitable PA contents. The PA booklet was written in English. The structure of the module began with the preliminary section. This included an introduction on the current nutrition and PA condition in Malaysia. Next, it was followed by the aims of the booklet and the list of booklet units. The main body of the booklet outlined the detailed description of the units. The layout for each unit was standardized. The order of units started from basic topics to more specific PA topics. Lay terms were emphasized instead of scientific terminologies. The statements were also further supported by giving culturally-sensitive, appropriate and realistic examples. Graphical design and attractive pictures were incorporated to enhance the reader's understanding and interest to follow. The size of the booklet was A5 size in

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which it was handy to be carried.We designed the PA booklet based on social cognitive theory. We took into consideration numerous factors affecting a person's behavior: (1) personal factors (i.e., outcome expectations, outcome expectancies, self-efficacy); (2) behavioral factors (i.e., behavioral capability, self-regulation/ self-control); and (3) environmental factors (i.e., observational learning/ modelling, social environment).

Phase two was content validationby expert panels. Content validation is the checking of the appropriateness and relevance of the content in relation to its construct [15]. The panel comprised of five experienced experts in nutrition, health promotion, and education. This group of experts was purposely selected in order to produce complementary ideas from different expertise [16]. The content validation was an independent review process. The experts were provided with the module and a set of content validation forms. A total of six items were distributed in two evaluative aspects: scientific accuracy and content. Using a four-point Likert scale, based on the experts' answers regarding the degree of relevance, each item was classified as: (1) irrelevant, (2) of little relevance, (3) really relevant or (4) very relevant.The comments from experts were thoroughly reviewed and revisions were made accordingly.

3. Results

Development of the booklet

A PA booklet entitled "Let's Be Active" was developed. Figure 1 shows the cover of the booklet. The booklet was developed in A5 paper size (148x210mm – 5.8x8.3 in) consisting of 28 pages in its pre-validation version. After diagraming, the researcher sent this version of the booklet for printing and then to the experts, to determine content validity. The booklet contained of five units which is introduction to PA, PA recommendations, health risk of obesity, barriers of PA and safety during exercise. All five unit in the booklet were presented with colorful illustrations and tables. The contents were described in the Table 1. This booklet can be references or guidelines for adolescents to enhance their knowledge on how to being active.



Figure 1: Cover page of PA booklet

Table 1: Contents of the physical activity booklet

Unit	Title	**Contents**
1	Introduction to PA	• Definition of PA • Types of PA • Body mass index
2	PA recommendations	• Recommendation of PA • The PA pyramid • Tips to do PA in a fun ways
3	Health risks of obesity	• Health risk of being overweight and obesity • Explanation about sedentary lifestyle
4	Barriers of PA	• Explanation about internal and external barriers • How to overcome the PA barriers
5	Safety during exercise	• Tips to stay safe doingPA • FITT (Frequency, Intensity, Type, Time Frame) principle

The first unit began withthe definition of PA and types of PA. The steps on how to calculate body mass index (BMI) and energy balance concept were also incorporated in the booklet. In unit two, recommendations and PA pyramid were include in the booklet to show how much PA is required to lead a healthy and active lifestyle. It was known that, increased awareness may be a proximal effect of behavior change [18]. Improving PA awareness may therefore be a crucial initial component of promotion campaigns, although few interventions consider this. In Unit three, risk factors and management or prevention methods for obesity problems are also discussed in details. Effort in maintaining healthy body weight among this population should become a major priority in nutrition education and public health research in order to prevent further health risks that would be resulted from malnutrition [19]. Possible perceived PA barriers and the solutions to overcome the perceived PA was emphasized in unit four. Tips to reduce sedentary behavior and increase PA level were included in this unit as well. These information is deemed necessary given that more than half of the children and adolescents were classified as having low levels of PA [20].The last unit is to educate the reader to take safety measuresduring performing PA or exercise to reduce the risk of injury.

Content Validation

At this stage, the booklet was evaluated by experts. The age of the experts ranged from 28-50 years (41.0±7.6 years). The experts highlighted that lay terms should be used instead of scientific terminologies. Booklet was revised based on the recommendations given from expert panels accordingly (Table 2).

Table 2: Examples of comments that given by the expert panels

	Avoid technical terms	Use clear instruction for activity	References need to be stated	Use the correct and high resolution picture
Expert				
1	/			
2	/	/		
3		/	/	
4			/	/
5	/			

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4. Discussion

The PA booklet was developed in A5 size and consisted 28 pages, smaller size of booklet is portable and more convenient for education purpose [21]. Our booklet was presented with colorful illustrations to add attractiveness to the readers. Information was explained in the bullet forms and important points were bolded to emphasize the relevancy. The PA booklet design was in accordance with the recommendations from previous study [22].

In the process of content validation of the booklet, the contributions of experts were included. Although the overall contents was satisfactory, the experts made suggestions for changes relevant to improving the booklet. Other studies that validated printed educational materials also undergo adjustments until the validated final version was reached, demonstrating the importance of performing this step for development of quality educational materials [23, 24].

This process of adapting educational materials to the experts' suggestions is an essential step to make the product more complete, more scientifically rigorous and effective for use during the health education activity. This stage is also referred to by other studies as having great relevance for the improvement of the material to be validated, in which, likewise, the reformulation and the exclusion of information, substitution of terms, as well as the reformulation of the illustrations were suggested [24, 25].

We developed the PA booklet by applying social cognitive theory. A few studies showed that the main resources for gaining health-related information were television/radio, newspaper/ magazine, or the Internet [26]. However, certain data from the mass media were based on insufficient scientific evidence. This inaccurate information can mislead adolescents. Therefore, we attempted to correct misinformation gained from the mass media regarding PA and energy balance when we developed this booklet. Additionally, social cognitive theory emphasizes that the social environment determines one's behavior. As a result, this booklet was developed in easy-to-read format with appropriate use of language so that parents, teachers and peers can refer to this PA booklet too.

There are limited resources regarding physical activity at the national level. The number of PA educational materials for health professionals was very limited. Moreover, the existing materials only included contents about nutrition, limited information regarding PA. Therefore, the PA booklet we developed would be very useful for health professionals to education adolescents in secondary schools. The ultimate goal of this booklet is behavior change. However, existing textbooks of physical education and health education partially cover information regarding PA and has a teacher-centred approach. It was hard for adolescents to apply their new knowledge to change their PA behaviours because there were no proper PA information deliver to them. Hence, we developed the PA booklet by supplementing the weakness of the existing textbooks or materials.

The limitation of this study was the lack of validation by a specialist in the communication field. Having completed the development and validation of the booklet, the study does not end here, but the booklet will undergo continuous updates based on scientific progress, and it is intended to use validated material in the specialized services, as well as to conduct future research to assess its effectiveness in achieving the implementation of measures to increase PA level among adolescents. This booklet covers only five units regarding PA. Future research needs to include more themes to cover additional critical PA problems in adolescents. Finally, the support of government agencies is necessary for reproduction, dissemination and wide distribution of this material in the health services, in different media, in addition to the printed version.

5. Conclusion

The objective of the study was to describe the development and validation of an educational booklet for PA. The booklet was validated according to content validity by experts and should therefore be considered in the context of educational activities to be an instrument capable of improving PA level among adolescents. However, further improvements on the content and design of the module will be needed before applying this module in a large scale study.

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