

Development of Nutrition Educational Tool on Carbohydrate Counting Concept for Adult Sri Lankans with Diabetes

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Abstract

The overall prevalence of diabetes in Sri Lanka is as high as 14.2 % for men and 13.5 % for women. Self-management education on food choices and meal planning for people with diabetes is important in the management of diabetes. The carbohydrate counting concept which is a simple and easily understandable method for food choices and meal planning has not been used as a nutrition educational tool in Sri Lanka. The aim of this study was to develop a nutrition educational tool using carbohydrate counting concept for adults with diabetes in Sri Lanka. Different types of educational tools were reviewed and a booklet was selected as the nutritional educational tool. The content validity and format of the draft booklet were proved in order to getting the right message and easily to read by the experts. The developed nutrition educational tool is colourful booklet with 13 cm in width and 20 cm in length. The booklet is composed of 2 sections. The first section provides the general information on diabetes, and dietary management strategies of diabetes such as plate model and food exchange list. The second section describes on types of carbohydrate, carbohydrate containing food groups, carbohydrate content in one portion exchange for each food groups and the steps of carbohydrate counting. The developed educational tool is a self-help guide for estimating carbohydrate amount in commonly used Sri Lankan foods. The booklet also provides a preliminary guide illustrating the printed nutrition information material on carbohydrate counting for people with diabetes in Sri Lanka.

Key words: Diabetes, Meal planning, Carbohydrate counting, Educational tools, Booklet

Introduction

In Sri Lanka, the number of people with diabetes is increasing. Diabetes self-management education is a process of teaching individuals to manage their diabetes and has been considered an important part of the clinical management of individuals with diabetes (Nagelkerk *et al.*, 2006).

Self-management education on food choices and meal planning for people with diabetes is important in the management and prevention from the complications of diabetes. There are different educational tools for educating on meal planning and food choices for people with diabetes. Carbohydrate counting that focuses on the total amount of carbohydrate as the primary nutrient affecting postprandial glycaemic response is one of the meal planning approaches used on clients who have diabetes. Carbohydrate counting concept allows variety

in food choices to fit a person's preferences and lifestyle (Anderson *et al.*, 1993). The study of Sheard *et al.* (2004) showed that the total amount of carbohydrate consumed is a strong predictor of glycaemia response, and thus, monitoring total grams of carbohydrate, whether by use of exchanges or carbohydrate counting, remains a key strategy in achieving glycaemia control.

Although nutrition therapy is one of the most challenging aspects of diabetes care (Nagelkerk *et al.*, 2006), less attention is given in Sri Lanka to provide education on dietary management of diabetes. As a result many people with diabetes may not know how to select the appropriate foods and how to select the correct amount of foods that help to manage their diabetic condition. The development of a simple nutrition education tool by using carbohydrate

counting concept may be an effective tool for control and management of diabetes as well as may help to cut down the expenses for health and to improve the quality of the life of the people with diabetes.

The aim of this study was to develop a simple nutrition educational tool based on carbohydrate counting concept for providing knowledge and guidelines on estimating carbohydrate amount in the foods consumed by diabetic people.

Materials and Methods

The carbohydrate counting concept is a new approach for Sri Lankans. Information on diabetes management was reviewed in detail particularly of dietary management. From the different types of educational tools available, an appropriate design of a booklet was selected as an educational tool. This educational booklet was published by Daly *et al.* (1995) including "Carbohydrate counting, Getting started: Level 1" and "Carbohydrate counting, moving on: Level 2". The book on "Nutrition Guide" for Sri Lankan (Wikramanayake and Gunerathne, 2000) was also used to develop the model educational tool.

The contents of the booklet are divided into 2 sections. The first section contains general information about diabetes. The second section, focuses on carbohydrate containing foods, methods of counting carbohydrate, and steps for counting carbohydrate.

The data of carbohydrate contents of commonly eaten carbohydrate rich foods in Sri Lanka were gathered from Sri Lanka Food Composition Tables, Asian Food Composition Tables, research findings related to nutritional values of Sri Lankan Foods and Food labelling of several food products in Sri Lanka. Carbohydrate containing food items were categorized into 4 food groups; starch, fruit, milk and vegetables. Snacks and

desserts are also included under the relevant food group according to their nutrient composition.

After gathering data of carbohydrate content and serving size of foods, the food items were weighted for an exchange portion, afterward the photographs of the foods were taken. The pictures would be presented in the booklet. First, the booklet was developed in English language and then translated into Sinhala language.

Three experts in the field of nutrition and dietetics reviewed the completed content and wording, as well as illustrations of the booklet. Furthermore, ten people with diabetes justified the format and presentation of the entire booklet. This step aimed to confirm the understandability, credibility, and relevance of the message before the actual booklet was produced. The consistence of the illustrations with message was agreed. All the people with diabetes, who validated the booklet, agreed positively with the booklet and had a few comments on some parts.

Results and Discussion

The developed nutrition educational tool is a colourful booklet for giving knowledge about carbohydrate counting concept for adult people with diabetes. Commonly consumed carbohydrate rich food items included under each carbohydrate containing food category for developing the educational tool.

The booklet was composed of 2 sections. The first section was the general information on diabetes, and dietary management strategies of diabetes such as plate model and food exchange list. The second section was on types of carbohydrate, carbohydrate containing food groups, carbohydrate content in one portion exchange for each food groups and the steps of carbohydrate counting.

Food category	Food items
Starchy foods	Rice, Bread, Biscuits, Corn, Yams, Sting hoppers, Hoppers, Yellow rice, Green gram, Rotti, Cake, Kaum, Pittu, Thalakaralie, Pan cake, Sweet potato, Coconut toffee, Mungbean, Attirasa, Sugar, Jam, Honey, Dhal, Potato, Papadam
Fruits	Rambuttan, Banana, Papaya, Mangusteen, Mango, Fruit juice, Water melon, Jack fruit, Peryas, Rose apple, Orange, Graphs, Pine apple
Milk and milk product	Milk, Ice-cream, Yogurt, Milk toffee, Milk powder
Vegetables	Beans, Pumpkin, Carrot, Kale, Jerkin, Gotukolla, Cabbage

The content validity and format of the draft booklet were proved in order to get the right message and easily to read by experts. There were some suggestions that in the photos, too many photos and colour in the booklet. Experts also had comment about format of booklet namely font size in content which were advised to increase the size. All experts advised to change the sequence of contents and few words in order to encourage health promotion behaviours.

Furthermore, ten people were also justified the format and presentation of the booklet. Their suggestion was to present the information in simple Sinhala language which also accounted to develop final booklet.

The booklet provided preliminary guide to illustrate the printing nutrition information material on carbohydrate counting for people with diabetes.

The booklet was comparable in term of topics to the information of Rickheim *et al.* (2000) who mentioned the suggested topics to be covered at self-management education intervention for diabetes which might being with a brief review of diabetes, management, the goal to control blood glucose levels, impact of food on glucose, carbohydrate counting, how to use nutrition facts on food labels and lifestyle behaviours for management of diabetes. As this tool was the first attempt to introducing the carbohydrate counting

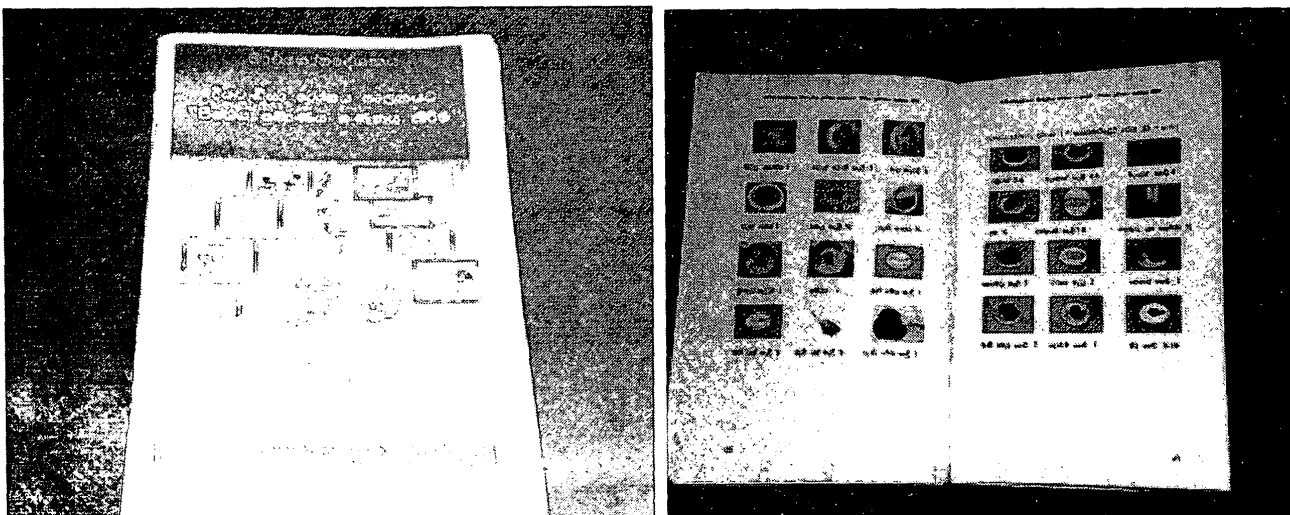


Figure 1. The nutrition educational tool model: Booklet for carbohydrate counting for people with diabetes in Sri Lanka

concept for the target audience, given all the information on carbohydrate under the separate section.

Several important considerations such as short sentences with simple words, few words on a page, use of illustrations were taken in to account when constructing the booklet. From previous study, the appearance of printed materials was thought to be crucial factor in determining whether people read or disposed of them. Therefore, the developed educational tool was follow to the characteristics of the efficient printed materials. These characteristics included content characteristics such as the use of short sentences with simple words, and the appropriate use of the awareness messages to motivate audiences, and design characteristics such as the use of headings, optimizing material into paragraphs, using a sufficiently large font, use of underlying, arrows, and bold face print, colour coding, and colour illustration.

The booklet was different from other traditional printed materials and it was developed for easy to understand using a colourful and pictorial format which stimulated the target population who had literacy skills to read it. One exchange portion of commonly consumed carbohydrate rich food photographs were included under each carbohydrate containing food groups (starchy, fruits, milk, and vegetables) to estimate the number of exchange portions of foods that readers' consumed. Each carbohydrate containing food groups' one exchange portion contain carbohydrate amount was given.

This developed educational tool was included commonly consumed carbohydrate rich food items. It is important to include seasonal food items that are rich in carbohydrate and will be able to use this educational tool to estimate carbohydrate amount in seasonal foods.

In conclusion, the developed colourful nutrition education booklet on carbohydrate counting concept is a preliminary guide to illustrate printed nutrition information material on carbohydrate counting for people with diabetes in Sri Lanka and it is important to counting carbohydrate in commonly Sri Lankan consumes foods.

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