

## Development of the Booklet "Prevention and Management of Hypertension for Older Adults"\*

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### ABSTRACT

Hypertension is prevalent among older adults, and nutrition is important for hypertension management. However, there are few nutrition education materials developed for older adults. The purpose of this study was to develop a booklet for prevention and management of hypertension for older adults. Based on lesson plans, topics for the booklet included introduction to hypertension, hypertension prevention through weight management, nutritional management of hypertension, and lifestyle modifications. After several revisions of the draft were made, illustrations and icons appropriate to the text were designed by a graphic designer using Illustrator 9.0 and Photoshop 6.0. The booklet consisted of four chapters and 40 pages. The first chapter dealt with information on hypertension, risk factors, complications and dietary guidelines. These were mainly explained by illustrations and characters of older adults. The second chapter included assessment of obesity, reducing fat intake and behavioral change strategies. The third chapter focused on practical tips for reducing salt, eating more fiber and calcium, and sample menus. The fourth chapter presented information for quitting smoking and drinking, and stress management. Finally, games, meal planning and quizzes, were presented as reinforcement. Based on pilot testing with 10 adults aged 50 and older, minor changes were made in wording, expressions and information. This booklet is characterized by using simple and specific messages, providing tips for dietary and lifestyle changes, and using illustrations and characters of older adults to increase understanding. The revised booklet is self-explanatory and can be used by older adults or in nutrition education for older adults. (*J Community Nutrition* 6(1) : 26~34, 2004)

**KEY WORDS** : older adults · hypertension · nutrition education materials · booklet.

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### Introduction

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Since the elderly population is growing fast in Korea, the number of older adults suffering from chronic diseases is increasing. Hypertension is the prevalent disease among older adults. According to recent statistics, the prevalence of hypertension is high among adults aged 60 and older, showing the prevalence of 248 per 1,000 persons in this age group (Korea National Statistical Office 2001). Considering the fact that hypertension is a 'silent' disease, the prevalence and

significance of hypertension might be greater than surveyed. High blood pressure leads to complications such as atherosclerosis, stroke and heart diseases. It also affects the quality of life in terms of physical, social and emotional function (Kim et al. 2001). Thus, prevention and early management of hypertension is needed.

In hypertension management, diet and lifestyle changes were known to be effective and efficient in terms of cost-benefit analysis (Joint National Committee 1993). However, hypertensive patients in Korea mainly relied on medications (Baek, Cho 1997), putting less effort on lifestyle changes. Recently, nutrition education programs for hypertensive patients were performed at public health centers (Son, Kim 2001 ; Yim 2000 ; Yim et al. 2000).

Yim (2000) implemented three sessions of nutrition education for hypertensive older adults. Nutrition education included what hypertension is, risk factors, weight management, dietary guidelines and nutritional care, regular exercise

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and limiting alcohol intake. After receiving nutrition education, older adults ( $n = 35$ ) in this study showed positive changes in nutrition knowledge, self-efficacy and food attitudes. In addition, some dietary changes such as reducing the intake of animal fats, processed foods and sweets were noticed in this study (Yim 2000). In another study, hypertensive older adults received seven sessions of nutrition education for hypertension management. These included introduction to hypertension, dietary guidelines, salt and blood pressure, food selection, meal planning, lifestyle modifications and follow-up (Son, Kim 2001). After participating in nutrition education, older adults in this study significantly increased the consumption of energy and calcium and decreased sodium intake accounting for energy intake. These study results showed several positive changes in nutrition knowledge or dietary behaviors, suggesting the impact of nutrition education for the management of hypertension.

While the interest toward nutrition education for hypertension management is increasing, there are few educational materials specifically designed for older adults. As the older population increases, the needs for nutrition education materials for older adults are growing. A survey with dietitians suggested that nutrition education materials for older adults be developed considering visual appropriateness, using simple and specific messages, constructing contents that are easily understood, and attractiveness (Kim et al. 2001). The purpose of this study was to develop nutrition education material and the booklet for prevention and ma-

agement of hypertension, for older adults.

## Methods

### 1. Outlines for developing a booklet

As to the types of nutrition education materials, we decided to develop a booklet for older adults, based on the needs assessment regarding nutrition education materials for older adults (Kim et al. 2001). The target might be extended to adults aged 50 and older, since chronic diseases such as hypertension develop for a long time, and the care for hypertension should be started at an earlier age. The booklet, "Prevention and management of hypertension for older adults", was designed to provide information regarding hypertension, hypertension management through diet and lifestyle changes, and tips for these changes. The booklet was developed to be self-explanatory as well as to be used in nutrition education programs for older adults.

First of all, we developed lesson plans as the framework for creating the booklet. Topics and contents of lesson plans were chosen based on literature regarding hypertension and nutrition (Kim 2000 ; Korean Dietetic Association 1999 ; Mo et al. 2000 ; Park 2000). Three nutrition professionals reviewed the lesson plans. Subtopics for the booklet were identified based on the lesson plans (Table 1).

### 2. Constructing contents of the booklet

The contents of the booklet were developed based on

**Table 1.** Outlines for developing a booklet for prevention and management of hypertension

Section	Topics
Introduction to hypertension	<ol style="list-style-type: none"> <li>1. Hypertension : definitions, symptoms and complications</li> <li>2. Assessment of risk factors for hypertension</li> <li>3. Guidelines for hypertension management</li> </ol>
Hypertension prevention through weight management	<ol style="list-style-type: none"> <li>1. Assessment of ideal body weight and obesity</li> <li>2. Tips on reducing fat</li> <li>3. Tips on weight management : behavioral change</li> <li>4. Physical activities and hypertension</li> </ol>
Nutritional management of hypertension	<ol style="list-style-type: none"> <li>1. Tips on reducing salt</li> <li>2. Potassium, calcium and fiber help to lower blood pressure</li> <li>3. Sample menus for two days</li> </ol>
Reducing drinking, smoking and stress	<ol style="list-style-type: none"> <li>1. Alcohol and blood pressure ; Tips on reducing alcohol intake</li> <li>2. Smoking and blood pressure : Tips on quitting smoking</li> <li>3. Stress and blood pressure : Tips on reducing stress</li> </ol>

professional journals and publications on nutrition for older adults, nutrition and hypertension, and existing educational materials (Cho 2002 ; Kim 2000 ; Korean Dietetic Association 1999 ; Park 2000 ; Son, Heo 2002). The draft of the booklet was revised about eight times by a research team considering the validity and accuracy, comprehension, and appropriateness of words. The draft was modified by the comments of three dietitians working in hospital or public health departments. A writer also reviewed the booklet to make it more readable and more easily understood.

**3. Developing the booklet**

After the contents of a booklet were developed through several revisions, it was designed and edited by including illustrations, pictures, and figures created by a graphic designer. Illustrator 9.0 was used to design illustrations and icons appropriate to each text, and Photoshop 6.0 was used to adjust colors of the pictures or illustrations. Characters of older adults and transformed characters were created and inserted in to the booklet. Pagemaker 6.5 program was used to combine the created materials into a booklet.

**4. Pre-testing the booklet**

The booklet was pilot-tested with ten adults, aged 50 and older, by one-to-one interviews. Subjects were recruited at a public health center or by personal contacts. Subjects were asked to read and review the booklet thoroughly. The investigator met the subjects a week later, and interviewed the subjects by asking to check the sections, sentences, words or illustrations that were difficult to understand or needed modification. Subjects were also asked to respond to closed-format questions to examine the degree of understanding, sufficiency of information, attractiveness, font size, illustrations, and usefulness of the booklet in daily lives. The booklet was finally revised based on the pilot-testing.

using illustrations as much as possible, iii) include both food portions and weight(g) for each food in salt intake assessment. They suggested many practical tips for nutritional management, based on educational experiences with older adults. They also checked the words and sentences, and suggested changes if needed. The following describes the booklet developed in this study in detail.

**B) Booklet layout and design**

The title of the booklet was “Prevention and management of hypertension for older adults”. It was composed of four chapters (Table 1), consisting of 40 pages, and was published on letter-size papers. Each chapter started with an introductory page using illustrations of older adults. The font size for the text was 13, and a larger font (e.g., 15, 20) was used for titles and subtitles. The format of the booklet was similar to the nutrition education materials for older adults previously developed by Kim et al. (2002).

**C) Contents**

**(1) Introduction to hypertension**

The first chapter dealt with an introduction to hypertension, by presenting the definition and assessment of hypertension, risk factors, symptoms and complications of hypertension (Kim 2000 ; Korean Dietetic Association 1999 ; Lee et al. 1999 ; Park 2000 ; World Health Organization 2003). Illustrations and characters of older adults were used to increase understanding, familiarity and attractiveness (Fig. 1). Self-assessment sections such as recording their blood pressure and checking risk factors were provided to induce the user’s participation.

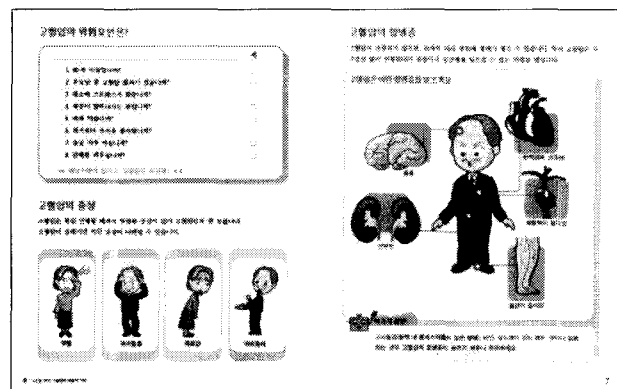
The first chapter ended with guidelines for hypertension

**Results and Discussion**

**1. Developing a booklet for prevention and management of hypertension**

**A) Comments from nutrition professionals**

In developing the booklet, three nutrition professionals reviewed and commented on the draft. The major comments were : i) include a section for user-participation (e.g., eating behavior assessment) in weight management, ii) explain



**Fig. 1.** Booklet page : Risk factors, symptoms and complications of hypertension.

management (Fig. 2). Based on literature (Korean Dietetic Association 1999 ; Maban, Escott-Stump 1996 ; Morrison, Hark 1999 ; Park 2000), the guidelines were suggested as seven behavioral categories ; weight management and reducing fat intake, regular exercise, eating less salt, eating enough calcium and fiber, quitting drinking, quitting smoking, and stress management.

(2) Hypertension prevention through weight management

The second chapter started with the importance of weight control for hypertension management and assessment of ideal body weight and obesity (Han et al. 2001 ; Kim 2000 ; Lee et al. 1999 ; Lee 2000) (Fig. 3). Ways of controlling weight, information and tips on reducing fat intake were

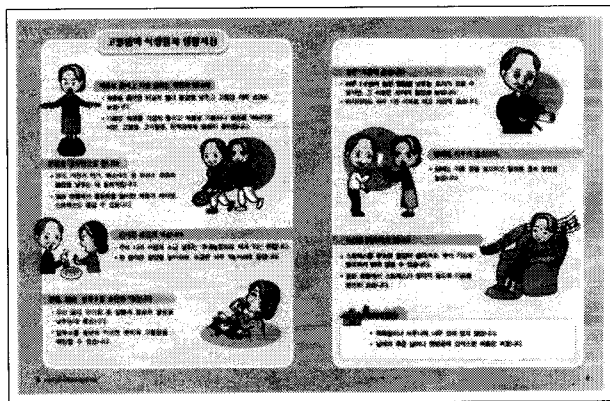


Fig. 2. Booklet page : Guidelines for hypertension management.

presented. Practical tips on selection, preparation and cooking foods (e.g., removing visible fats, using steamed or baked dishes, etc.) were suggested. Foods to eat less of (e.g., jeon, japchae, samgyupsal, galbi) were also presented with foods to eat frequently (steamed potato, bibimbap, tofu, fruits and vegetables) using illustrations of foods, to compare high caloric foods with relatively low caloric foods. Foods commonly consumed by older adults were shown in these examples.

The next was behavioral change strategies for weight control, such as goal setting, simple monitoring of one's eating behaviors and modification of undesirable behaviors (Fig. 4). Behavioral change strategies were presented with examples to help understanding. In addition, there were sections for user's participation to induce learner's motivation. These included a checklist of eating behaviors, and self-planning for behavioral changes by filling out the goals of weight, one's eating behaviors, and graphs for weight changes. Information on physical activity and exercise were presented at the end of second chapter (Jin 2002 ; Kim 2000 ; Korean Dietetic Association 1999) (Fig. 5).

(3) Nutritional management of hypertension

The third chapter dealt with desirable eating behaviors for hypertension management, focusing on reducing salt, and adequate intake of potassium, calcium and fiber. Sodium intake is the major concern in hypertension management,

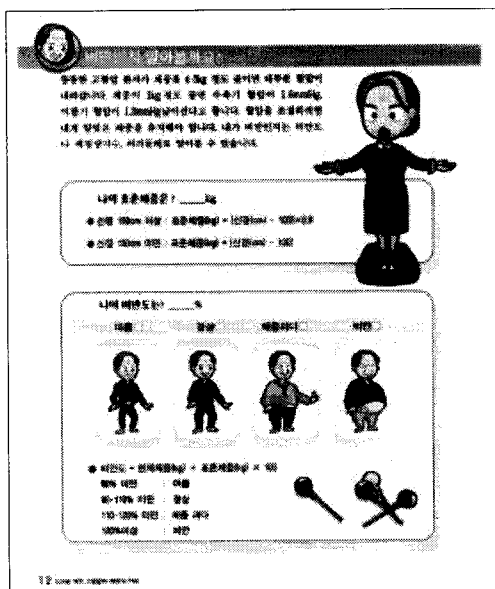


Fig. 3. Booklet page : Self-assessment of ideal body weight and obesity.

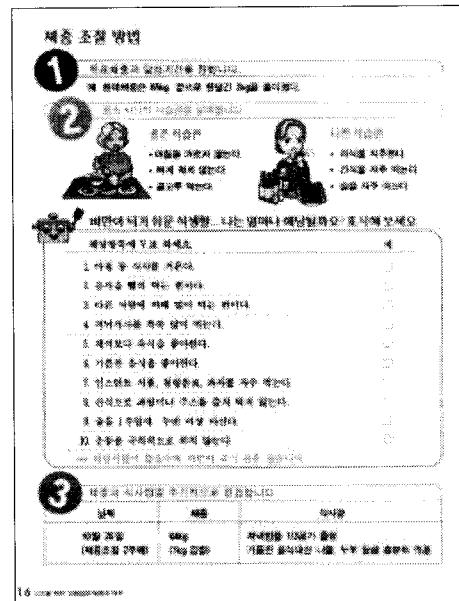


Fig. 4. Booklet page : Behavioral modification for weight control and assessment of eating behaviors.

while the actual intake exceeded the recommended level (2,400mg of sodium) in a Korean's diet (Korean Nutrition Society 2000). In the section of reducing salt, the relation of salt and hypertension was presented shortly (Shin 2002), followed by self-assessment of frequency of eating high-salt foods. In this checklist, fourteen foods including kimchi, chigae (bean paste), soups (seaweed, bean sprout), anchovy, ramyun were presented. These foods were chosen based on salt contents of foods (Son, Heo 2002) and frequency of consumption by older adults. Also snacks of high in salt (e.g., bread, jajangmyun, ramyun, cracker) and low in salt (e.g., potato, apple, orange) were presented with illustrations, to help older adults carefully select the snacks. Tips on reducing salt by selecting foods and preparing meals sensibly were suggested (Son, Heo 2002) (Fig. 6). Similarly, the relation of nutrients (potassium, calcium, fiber) to hypertension was shown (Maban, Escott-Stump 1996 ; Mo et al. 2000 ; Morrison, Hark 1999 ; Park 2000) and tips on eating these nutrients adequately were presented.

Sample menus for two days were shown at the end of this chapter (Fig. 7). Menus were planned based on nutritional concerns, taste, cost and easily digested foods (Choi, Park 2001). We cooked the foods in these menus and took pictures of each meal. The food pictures of each meal were shown in the booklet. To reduce salt in preparing meals, icons of salt shakers were shown in the food list of each menu to indicate using less salt in these foods.

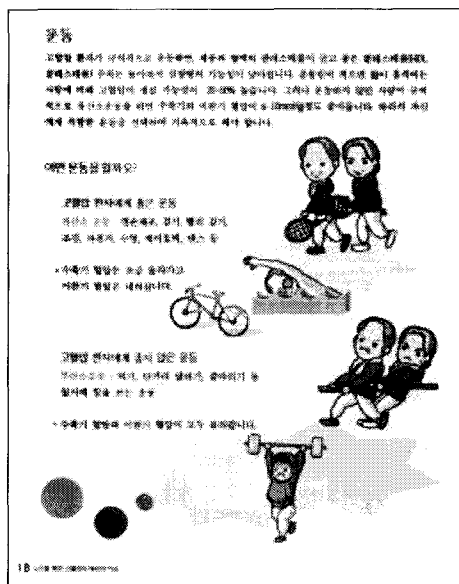


Fig. 5. Booklet page : Exercise for hypertension management.

(4) Reducing drinking, smoking and stress for hypertension management

The fourth chapter included information and tips for lifestyle changes. The first section dealt with reducing drinking. In this section, the information about a serving of alcoholic beverage, disadvantages of drinking for hypertension management especially in older adults, and tips on reducing alcoholic beverages were presented (Korean Dietetic Association 1999 ; Morrison, Hark 1999). A contract form for reducing drinking was inserted in this section to increase the motivation and commitment for behavioral change (Fig. 8).

With respect to the section of smoking cessation, the disadvantages of smoking and advantages of quitting smo-

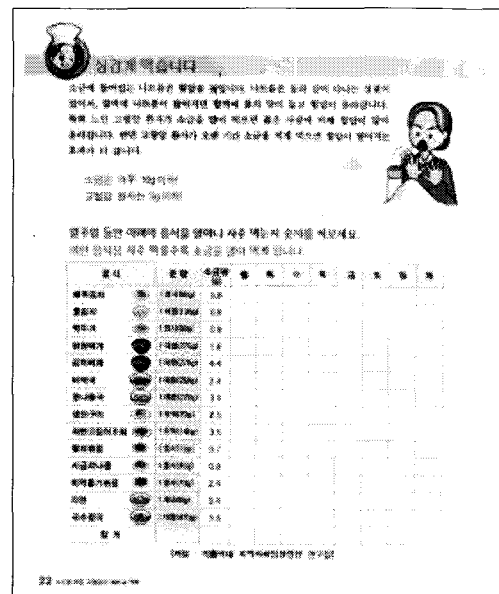


Fig. 6. Booklet page : Tips on reducing salt.

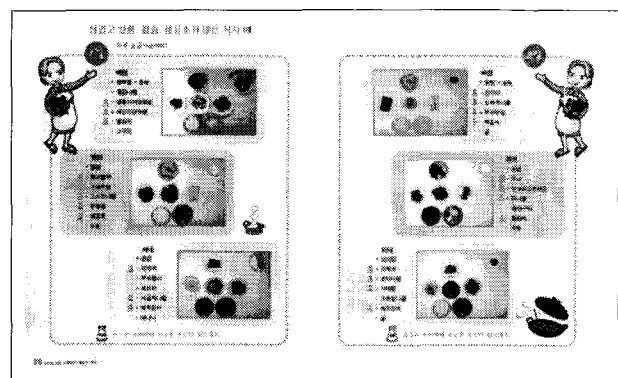


Fig. 7. Booklet page : Sample menus for two days for hypertension patients.



## 2. Pilot-testing of the booklet

A pilot-test of the booklet was conducted with ten adults aged 50 and older (mean age :  $60.7 \pm 7.9$  years, 6 women, 4 men). Most of them had received a college or higher education ( $n = 8$ ), and the rest had received elementary or middle school education. Subjects responded that the most helpful chapter was 'Nutritional management of hypertension' ( $n = 6$ ), followed by 'Hypertension prevention through weight management' and 'Reducing drinking, smoking and stress' ( $n = 2$ , respectively). Most subjects indicated that the information in the booklet was sufficient, easy to understand, and attractive (Table 2). They also responded that the illustrations were 'very helpful' or 'helpful' to understand the text, and it would be helpful to use the booklet in daily

lives. Seven out of ten subjects responded that font size (13 point in the text) was adequate, while three subjects indicated that it was small. These results suggested that the booklet developed was quite easy to understand, attractive, and provided practically applicable information.

The major comments from the interviews using open-ended questions are presented in Table 3. Major comments from these interviews were as follows : i) generally, it was easy to understand the text, ii) some subjects have difficulty in understanding some words (e.g., aerobic exercise, portion size) and assessment of obesity (e.g., ideal body weight, obesity index), iii) it would be better to replace some food illustrations in the example with the foods that older adults frequently eat, iv) important things in the text need to be

**Table 3.** Evaluation of the booklet using open-ended questions and interviews

Chapter	Major comments	Revisions
Introduction to hypertension	<ul style="list-style-type: none"> <li>• It would be better to explain more about how to measure blood pressure.</li> <li>• Some words are ambiguous.</li> <li>• It's somewhat overloaded with information.</li> <li>• It would be better to indicate more clearly about the focus of this chapter.</li> <li>• Overall, it's not difficult to understand.</li> </ul>	<ul style="list-style-type: none"> <li>• Suggested more information about blood pressure measurement by including posture, foods to avoid before measurement.</li> <li>• Some minor changes in wording were made.</li> <li>• Used larger font size and different color for important words.</li> <li>• Reduced text and sentences, and explained using illustrations more.</li> </ul>
Hypertension prevention through weight management	<ul style="list-style-type: none"> <li>• Please have more information regarding blood pressure and weight control.</li> <li>• Some older adults had difficulty in calculating IBW or obesity index.</li> <li>• Some words with similar meanings need to be changed.</li> <li>• Some sections were overloaded with information (e.g., aerobic, un-aerobic exercise, exercise intensity).</li> <li>• It's generally easy to understand.</li> </ul>	<ul style="list-style-type: none"> <li>• Add the information on the relationship of weight loss on blood pressure.</li> <li>• Expressed the formula for IBW, obesity index using symbols (<math>\div</math>).</li> <li>• Minor changes in wording were made.</li> <li>• Added examples of aerobic, un-aerobic exercises, and exercise intensity.</li> </ul>
Nutritional management of hypertension	<ul style="list-style-type: none"> <li>• It's difficult to understand some words (e.g., sodium, portion size).</li> <li>• It's not clearly visible for some highlighted words (color).</li> <li>• Some examples of food illustrations are not adequate for older adults.</li> <li>• More explanations are needed in sample menus.</li> <li>• It's nice to have tips for nutritional management and sample menus.</li> </ul>	<ul style="list-style-type: none"> <li>• Minor changes in wording were made.</li> <li>• Minor changes in font size, colors of some words were made.</li> <li>• Foods and snacks in examples were somewhat changed considering frequently consumed foods in older adults (e.g., rice cake, potato).</li> <li>• Added explanations on illustrations of salt shakers in sample menus.</li> </ul>
Reducing drinking, smoking and stress	<ul style="list-style-type: none"> <li>• Please indicate more clearly the important things in drinking</li> <li>• Overall</li> </ul>	<ul style="list-style-type: none"> <li>• Indicated more clearly by using symbols (O, X) in the illustrations of behaviors.</li> <li>• Used highlighted colors for the advantages of smoking cessation.</li> </ul>
Games	<ul style="list-style-type: none"> <li>• In meal planning, please add more foods.</li> <li>• It would be better to have evaluation results of meal planning more clearly.</li> <li>• It's interesting.</li> </ul>	<ul style="list-style-type: none"> <li>• Added more food items (e.g., whole grains, barley rice).</li> <li>• Added more explanation on evaluation results</li> </ul>

highlighted more using colored font, symbols and illustrations. Based on these responses, the booklet was finally revised as shown in Table 3. This booklet is self-explanatory and can be used by older adults. In addition, it can be used in nutrition education at public health centers or senior centers.

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### Summary and Conclusion

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The purpose of this study was to develop the booklet for prevention and management of hypertension for older adults. The booklet, consisting of four chapters and 40 pages, was developed, and produced on letter size paper. The major topics in the booklet were introduction to hypertension, hypertension prevention through weight management, nutritional management of hypertension, reducing drinking, smoking and stress for hypertension management. The drafts of the booklet were reviewed by the researchers and three nutrition professionals, and finally pilot-tested with ten adults aged 50 and older. The characteristics of the booklet are as follows :

- 1) simple, specific messages were used for older adults;
- 2) diverse pictures, illustrations, artwork, characters of older adults were created and used to enhance understanding, interest and familiarity ;
- 3) practical tips were provided for eating behavior and lifestyle changes. For example, tips on reducing fat and salt, increasing calcium and fiber intake, quitting smoking and drinking were presented ;
- 4) there were many sections for participation of the learners, including assessment of risk factors, eating behaviors, monitoring weight changes, plans for weight control and eating behavior change, contract form for smoking cessation and reducing drinking ;
- 5) sample menus and food pictures were presented to help the learner to understand meal planning for hypertension management ;
- 6) games were included to reinforce the information in the booklet and to increase interest.

This booklet can be used by older adults because it is quite self-explanatory. It also can be used in nutrition education programs at senior centers or public health departments.

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