

# Study on Diet Intervention Factors of Elderly Hypertensive Patients in China Based on COM-B Model

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**Abstract:** *The objective of the current study was to explore the factors that affect the dietary management of elderly hypertensive patients, and to provide a scientific reference for the selection and optimization of comprehensive prevention and treatment strategies for blood pressure control and health management for elderly hypertensive patients in the community, and to improve patients' self-management ability and blood pressure control effects. Based on the three necessary conditions of the COM-B framework: ability, motivation and opportunity, the factors affecting the eating behavior of hypertensive patients were analyzed, and the corresponding intervention plan was then formulated. The conclusion is that lack of awareness and social support is the main factor influencing dietary intervention in elderly hypertensive patients in the community. In addition, community-based dietary management of hypertension mainly includes health education, psychological intervention, exercise guidance and dietary intervention. At the same time, improving the blood pressure control effect and dietary management level of elderly hypertensive patients requires the joint efforts and cooperation of the government, community, patients and their families.*

**Keywords:** *Diet Intervention, Hypertension, COM-B Model*

## 1. Introduction

Hypertension is a clinical syndrome characterized by an increase in systemic arterial pressure, accompanied by systemic diseases with functional changes in organs such as heart, blood vessels, brain, and kidneys. Hypertension has become a major public health problem faced by the world and is one of the most common cardiovascular diseases (CVD). According to statistics, the prevalence of hypertension in the world is as high as about 15%, and more than one-quarter of men and one-fifth of women suffer from this disease. In China, about 270 million people suffer from hypertension, and only 13.8% of patients are under control. Hypertension is caused by a combination of psychological, social, biological and other factors, and is a behavior and lifestyle disease [1]. With the continuous development of social economy, poor diet and living habits make the group of hypertensive patients continue to grow. Therefore, the prevention and treatment of hypertension is a major health problem urgently to be solved by human beings.

Drug therapy is the main method to control blood pressure, but due to the poor self-management ability of patients, the clinical effect of drug therapy alone is often not ideal [2]. In recent years, non-drug therapy has played an increasingly important role, especially lifestyle (including diet, exercise). At the same time, many studies have shown that dietary intervention is very important for hypertension patients to control blood pressure. The habits and behaviors formed through diet management have different effects on the blood pressure control of hypertensive patients. In daily life, a reasonable diet structure such as eating more vegetables and fruits has a positive effect on the improvement of blood pressure, blood lipid and BMI in hypertensive patients [3]. For example, high-salt diet can significantly increase hypertension and increase the risk of hypertension. The prevalence of hypertension is linearly related to the average salt intake [3]. Pesantes confirmed that changing dietary habits, reducing salt intake, and reasonable diet can serve to prevent or assist in controlling blood pressure [1]. The purpose of this study is to explore the factors that affect the dietary management of elderly patients with hypertension and propose appropriate interventions and policies.

**2. Analysis of the determinants of behavior**

**2.1. COM-B framework**

The Capability, Opportunity, Motivation, Behaviour (COM-B) is a behavior change model. Meanwhile, Michie (2011) also derived the Behavior Change Wheel on the basis of the COM-B model. As shown in Figure 1, the model believes that the occurrence of behavior includes three necessary conditions: capability, motivation and opportunity. capability and opportunity can directly affect behavior, or indirectly influence behavior through motivation. The advantage of the COM-B model is that it can comprehensively and systematically understand the obstacles and promotion factors in the behavior model. According to this model, it is possible to make a diagnosis of how to achieve the expected behavior and provide a basis for the design of behavioral intervention [4]. Therefore, the COM-B framework is suitable for analyzing the factors that affect the dietary behavior of patients with hypertension, and then formulating corresponding intervention plans.

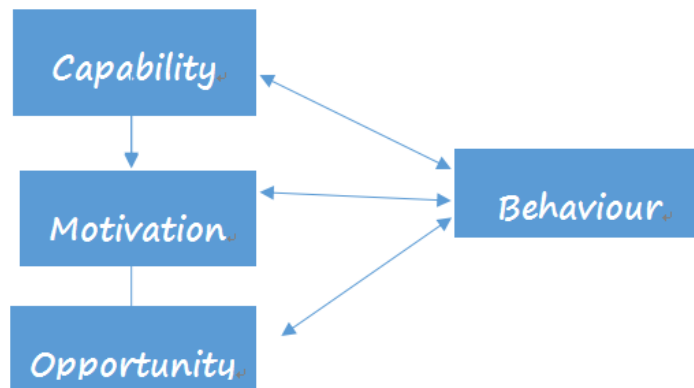


Figure 1: The COM-B framework for understanding behavior.

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**2.2. Capability level factors**

According to the COM-B framework, Table 1 shows the main determinants that affect the dietary behavior of elderly hypertensive patients. And the following paragraphs have specific analysis of each aspect.

Table 1: Analysis of Determinants of Dietary Behavior in Com-B Framework

Capability	Opportunity	Motivation
<p><b>Physical</b></p> <ul style="list-style-type: none"> <li>Limited outdoor activities                             <ul style="list-style-type: none"> <li>Physical function deterioration</li> </ul> </li> <li>Low level of education</li> <li>Lack of awareness of diet management</li> <li>Rarely participated in lectures or activities</li> </ul>	<p><b>Physical</b></p> <ul style="list-style-type: none"> <li>Limited income</li> <li>Insufficient publicity of dietary interventions</li> <li>Less access to acquire dietary information</li> <li>Inadequate community-based programmes</li> </ul> <p><b>Social</b></p> <ul style="list-style-type: none"> <li>Family caregivers lack of dietary educational interventions                             <ul style="list-style-type: none"> <li>Lack of social support</li> <li>Traditional dietary culture</li> </ul> </li> </ul>	<p><b>Motivation</b></p> <ul style="list-style-type: none"> <li>Lack of mechanism and incentives for the elderly group</li> <li>Lack of family and community engagement</li> <li>Insufficient confidence in elderly hypertension patients</li> </ul>

**2.2.1. Physical capability**

Physical capability refers to an individual's ability to perform physical activity, which is of great significance for health behavior intervention. Weight control can reduce the incidence of hypertension by 28%-40%, and can reduce weight by limiting physical intake and increasing physical activity [5]. Also, physical activity can not only increase energy consumption, but also improve glucose, increase

insulin sensitivity, and also increase the level of high-density lipoprotein, which is beneficial for controlling hypertension [5]. However, Elderly hypertensive patients suffer from headaches, dizziness, and difficulty breathing for a long time. At the same time, their physical function is reduced by age, and their daily activities and exercise abilities are also affected. Due to the decreased taste sensitivity and reduced chewing function of the elderly, they prefer meat with a salty diet and high fat content, which increases their health burden [6]. Therefore, impaired physical capabilities of elderly hypertensive patients may limit their physical activity and become a hindrance to dietary intervention.

### **2.2.2. Psychological capability**

Psychological capability refers to an individual's ability to obtain, understand and process basic health information or services and make correct health-related decisions [7]. Good diet management requires that elderly hypertensive patients have the skills to grasp and evaluate relevant knowledge and make appropriate health and lifestyle decisions. Studies have shown that education level, whether to receive dietary guidance, whether to participate in dietary management activities and lectures are important factors that affect dietary management in patients with hypertension [8]. Because the education level of elderly hypertensive patients is generally low, there is a misunderstanding or insufficient understanding of the harmfulness and severity of hypertension. Therefore, they do not attach importance to treatment, have poor compliance behavior, and poor self-management ability. People with higher education level have more knowledge about nutrition and health care, and pay more attention to their diet and eating behavior in life. In addition, the health literacy of the elderly group is greatly affected by age and cognitive function. Because of their older age, their ability to receive external knowledge is weaker, so it is more difficult to accept and implement new health interventions.

## **2.3. Opportunity level factors**

### **2.3.1. Physical opportunity**

Physical opportunities, including availability opportunities provided by the economy or the environment [9]. Firstly, the economic status of patients with hypertension may affect the implementation of dietary interventions. The elderly with high per capita income in the family have the conditions to improve their own diet, increase the intake of dairy products or other high-quality protein, and maintain good eating habits. Moreover, normally, people learn about the onset and control of hypertension by broadcasting, television, newspapers and other mass media. However, nearly 65% of patients said that they are not easy to access to knowledge of salt restriction standards and methods in daily life. It also shows that the mass media's publicity reports on the relationship between healthy diet and hypertension are relatively limited in China. In the study, it was found that the elderly is very eager to obtain health-related knowledge, but they receive insufficient information on community diet intervention activities and lectures. As a result, there is a lack of basic knowledge to prevent and treat hypertension. Many people believe that high blood pressure can only be treated with drugs [10]. Also, compared with patients who did not participate in diet management activities and lectures, patients who participated in diet management activities lectures paid more attention to diet management. This shows that the community should organize more dietary education lectures and activities to increase the chance of patients receiving dietary guidance.

### **2.3.2. Social opportunity**

Social opportunity refers to social support obtained through contact with family and friends, or social influences in a social setting. Daily behaviors are easily influenced by peers, and eating habits are no exception. Eating habits are greatly affected by family and friends [10]. In daily life, due to women's personality advantages and family role characteristics, women pay more attention to diet management than men. This may be because the aesthetic concept of contemporary society makes women pay more attention to their body shape and health, and therefore pay more attention to diet management. In most families in China, the preparation of ingredients and cooking are controlled by women. Their dietary concepts and habits may be directly related to the diet of the entire family. Therefore, special attention should be paid to the education and guidance of healthy eating for women. Meanwhile, the reasonable dietary guidance for hypertensive patients and their families can improve their poor dietary habits, thereby effectively controlling and improving blood pressure. However, family members do not cooperate with dietary guidance and poor communication between doctors and patients will affect dietary management of hypertensive patients. In addition, social support is also an influencing factor for dietary intervention in elderly hypertensive patients. With the change of medical model to biological-psychological-social model, social support as an intermediary factor of social psychological stress, has

been paid more and more attention to the role of buffering social pressure and improving treatment effect. Chronic patients often suffer from heavy social and psychological pressures, such as high medical expenses, changes in lifestyle and social roles, etc. All of this requires good social support to help patients actively cope with stress and improve the compliance of interventions. In China, due to the relative lack of medical resources, the social support received by elderly hypertensive patients mainly comes from the emotional support of family caregivers, but the family caregivers have a low level of dietary intervention knowledge and provide poor quality support to patients.

#### **2.4. Motivation level factors**

Motivation refers to all brain processes that can stimulate and guide behavior, including emotions, motivation, beliefs, etc. [9]. The patient's psychology is also an important factor affecting dietary intervention. In China, the common problem of hypertensive patients in the community is that there are many elderly patients, most of whom are retired and alone at home, and their children are rarely accompanied, which will lead to psychological loneliness of elderly patients. Also, patients with high blood pressure also affect the increase in blood pressure due to psychological anxiety and other conditions, which makes intervention more difficult. Furthermore, due to the long-term living alone, the elderly hypertensive group reduces their enthusiasm and confidence in their own management. Studies have shown that whether a hypertensive patient has confidence in using dietary interventions to maintain blood pressure stability has a direct impact on the effectiveness of the intervention [5].

### **3. Identification of interventions and policies**

Based on the above analysis of the factors affecting the diet of elderly hypertensive patients, the following will propose interventions and policies in terms of capability, opportunity, and motivation to achieve the target behavior.

#### **3.1. Capability intervention strategy**

In terms of physical and psychological capabilities, it is mainly manifested in the restricted outdoor activities of elderly hypertensive patients and the lack of awareness of healthy diet. Therefore, health promotion mainly revolves around exercise intervention and health education. Most of hypertensive patients have a poor lifestyle. Community intervention nursing staff can organize elderly patients to do some outdoor sports, such as public square dancing, walking, Tai Chi and so on. The prescription of hypertension exercise is summarized as follows: the sports are mainly aerobic exercise such as brisk walking, tai chi, dance, jogging, swimming, etc. At the same time, each exercise should last more than 40 minutes per day [11]. Physical exercise and dietary intervention as auxiliary methods can well reduce the blood pressure of elderly patients. In addition, the government can actively develop community sports. By providing social sports instructors or relevant departments to carry out relevant training for community personnel, organize a variety of sports and cultural activities, so that the community has formed a strong physical exercise atmosphere [11]. Secondly, health education is an important means to control and prevent hypertension. In the content of health education, the amount of specific food should be reflected, and the variety of diets should be emphasized. The majority of patients receive dietary guidance in groups, such as health lectures, brochures and other activities. However, in China, patients with hypertension and residents receive relatively little health guidance and are less targeted [10]. The development and high popularity of the Internet and new media have brought convenience. Based on traditional education methods, it should be combined with new media tools to provide patients with more comprehensive and applicable dietary guidance. For example, the dietary precautions are regularly introduced in the public subscription, and according to the patient's condition, upload their own diet-related data to develop targeted healthy recipes. At the same time, the family members of the patients should also be given corresponding healthy diet guidance and timely feedback. Thus, dietary health education can be carried out on online platforms through TV public service advertisements and mobile phones.

#### **3.2. Opportunity intervention strategy**

The targets of opportunity intervention are mainly to improve social publicity and social support. First of all, the government should step up its efforts to promote a light diet, diversify food intake, a balanced diet and develop a healthy lifestyle. And it is necessary to correctly guide the mass media to

actively report on the relationship between diet and hypertension in order to increase the attention and response of patients and residents [12]. The health department can repeatedly introduce foods beneficial to hypertensive patients through television advertisements, newspapers and other media to strengthen their awareness and help them gradually improve their eating habits. In addition, Community health workers should combine the promotion and treatment of dietary management, for example, the dietary staff should clearly emphasize the importance of a reasonable diet and its role in preventing and treating hypertension to each patient during the process of treatment. Secondly, social support also plays a very important role in the process of diet management. There are various supporting organizations, such as the Hypertension Club of Sunshine House, which help patients exchange feelings with each other, improve patients' self-management ability and quality of life. Also, it is necessary to mobilize the social support of family members and friends, and pay more attention to the elderly patients. In the entire intervention project, family members are invited to participate together to urge elderly patients to complete the expected health behavior goals. The government should increase investment in community-based basic medical institutions to provide trained workers and financial support for community-based basic health institutions to provide dietary guidance to patients with hypertension. The government should also optimize staffing, update and introduce medical equipment in community health institutions, and actively guide diet managers and professional nutrition experts to work in community-level health institutions. And set up a special hypertension diet management department, each patient with standardized management of hypertension has a corresponding person in charge. For example, the file number 1-50 is under the responsibility of the manager A. The manager communicates and feedbacks the patient's diet in time, and adjusts the diet intervention plan according to the patient's situation. Finally, the eating habits of the patients' family members affect the patients to a great extent, especially women. Therefore, women should be encouraged to learn more about the relationship between reasonable diet and prevention and treatment of hypertension. Encourage them to participate in various healthy diet lectures and activities, pay more attention to a reasonable and healthy diet when preparing ingredients and cooking.

### **3.3. Motivation intervention strategy**

The targets of motivational interventions are to increase the self-efficacy of hypertensive elderly and increase community engagement. Self-efficacy is people's self-confidence in their ability to perform certain activities, that is, they believe that they have the ability to perform certain activities [9]. Psychological intervention is of great significance to improve their self-confidence. Firstly, psychological counseling services can be set up in community intervention centers. Trained staffs should listen patiently to the patient's feelings, assess and analyze the causes of psychological problems, and provide targeted guidance to different individuals, and then help the elderly to increase their confidence in persistence. Moreover, the government should strengthen supervision and all departments should share information on diet management to provide a good environment for hypertensive diet management. Then, community health workers should take the initiative to consult with diet management professionals and other model communities to learn from diet management experience to better serve for patients. They can know the patient's condition and eating habits through telephone, Internet and other channels, and repeatedly provide personalized dietary guidance to patients and their families to increase the chances of patients receiving dietary guidance. In this way, it is possible to strengthen the information construction of diet management and the information communication between patients and community medical staff, and improve community participation [8].

## **4. Conclusion**

In summary, there are many factors that affect the dietary intervention of elderly hypertensive patients in the community, the most important of which is the lack of awareness and social support. However, dietary intervention is necessary for elderly hypertensive patients in the community. In addition, community hypertension diet management mainly includes health education, psychological intervention, exercise guidance and diet intervention. Meanwhile, improving the blood pressure control effect and diet management level of elderly hypertensive patients requires the joint efforts and cooperation of the government, the community, patients and their families.

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