Kind of support interventions and effects of them on self-management for patients with hypertension

A descriptive literature review

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Abstract

Background: Hypertension was the most common chronic disease and one of the major risk factors for cardiovascular and cerebrovascular diseases. With the number of people with hypertension increasing people were paying more and more attention to the risk factors and preventive measures of hypertension. For hypertensive patients, changing lifestyles through nurse intervention was essential, including medication and behavioral management.

Aim: To describe kind of support interventions and effects of them on self-management for hypertensive patients. And to represent what were the characteristics of the participants in the scientific articles included.

Method: Totally 114 related articles were found, among which 9 articles met the inclusion criteria and was included in to address the research question. And 1 article were selected by manual search. All 10 articles which were quantitative obtained from MedLine and CINAHL.

Result: This review summarized kind of support intervention and the effects of them on self-management of hypertensive patients. Medication management, behavioral management, telemonitoring and health education all could improve self-management ability and reduce blood pressure. The effect of medication management was better than that of behavioral management, but it was worse than comprehensive intervention. The characteristics of the participants in the selected articles were carefully described in appendix 1.

Conclusion: Hypertension was a kind of disease that can be controlled. Nurses' supports which included medication management, behavior management, telemonitoring and health education. These supports played a positive role in improving self-management and reducing blood pressure for the hypertensive patients. Blood pressure could be controlled by improving self-management ability.

Keywords: Effects, Hypertension, Intervention, Nurse, Support
摘要：

背景：高血压是最常见的慢性疾病，也是心血管和脑血管疾病的主要危险因素之一。随着全球高血压发病率的持续增加，高血压的影响因素和预防措施越来越受到人们的重视。对于高血压患者，通过护士干预改变生活方式是很重要的，干预措施包括药物治疗和行为管理。

目的：描述高血压患者的支持干预及其对自我管理的影响。以及呈现科学文章中参与者的特征。

方法：共发现114篇相关文章，其中9篇符合纳入标准，纳入研究问题。并通过手动搜索选择了1篇文章。所有10篇定量文章都是从MedLine和CINAHL获得的。

结果：本综述总结了措施的种类及其对高血压患者自我管理效果。药物管理、行为管理、健康教育和电话监测都可以提高自我管理能力和降低血压。药物管理的效果优于行为管理，但比联合措施差。所选文章的样本人群特点详见附录1。

结论：高血压是一种可以控制的疾病。作者发现护士的干预支持有药物管理、行为管理、电话监测和健康教育，对高血压患者的自我管理和降压有着积极的作用。自我管理的能力可以控制血压。

关键词：影响，高血压，干预，护士，支持
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1. Table 2 Overview of the selected articles

2. Table 3 Overview of the selected articles’ aims and results
1. Introduction

1.1 Background

Hypertension (HTN) is a major risk factor for cardiovascular disease and cerebrovascular accident, and it is considered as the most common chronic disease (Balduino, Mantovani, Lacerda, Marin, & Wal, 2016). Hypertension accounts for 7% of the global disability-adjusted life years (DALYs) (Lim et al., 2012). According to the monitoring of risk and protection by telephone survey of chronic disease factors, 24.8% adults were diagnosed as hypertension in 2014 (Lim et al., 2012; Iser, Claro, Moura, Malta, & Morais, 2011; Picon, Fuchs, Moreira, Riegel, & Fuchs, 2012). It is estimated that about 30% of the Brazilian adult residents have hypertension and 42.6% of people suffer from hypertension in China (Villela, Klein, & Oliveira, 2016; Wang, Zhang, Wang, Liu, & Wang, 2014). Hypertension received more and more attentions in the public health system since it reduces patient’s quality of life (Lima, Schwartz, Muniz, Zillmer, & Ludtke, 2011). According to World Health Organization (WHO), the overall goal of the world is to reduce the prevalence of hypertension by 25% in their population by 2025 (World Health Organization, 2015). In order to help the hypertensive patients to ease the disease, the Brazilian government established a medical reorganization plan to register patients with hypertension for follow-up actions in 2000, for an example, a free medication treatment program for anti-hypertensive medication (Iser, Claro, Moura, Malta, & Morais, 2011). Self-management can maintain and improve the condition of health of patients with chronic diseases (Novais, Conceic~ao, Domingos, & Duque, 2009). The self-management of care also should be conducted at multiple levels, including individuals, their families, medical professionals, organization and society (Cecilio, 2011). With the help and advice of health care professionals, especially nurses, hypertensive patients can effectively manage the disease themselves (Balduino, Mantovani, Lacerda, Marin, & Wal, 2016).
1.2 Hypertension

1.2.1 Hypertension-definition

Blood pressure is the driving force of the blood towards the arterial wall when the heart bumping. According to 2017 high blood pressure clinical practice guideline, hypertension also called high blood pressure, higher than 130/80 mm Hg in the currently internationally consistent (systolic blood pressure (SBP) /diastolic blood pressure (DBP)) mmHg when blood flows through arteries (Whelton et al., 2017). The severity of hypertension, normally, can be hypertension, normally, can be defined as three levels: elevated blood pressure (systolic pressure between 120 mmHg and 129 mmHg and diastolic pressure lower than 80mmHg), high blood pressure stage I (systolic pressure varying from 130 mmHg to 139 mmHg while diastolic pressure between 80 mmHg to 89 mmHg) and high blood pressure stage 2 (systolic pressure is higher than 140 mmHg or diastolic is higher than 90mmHg (Whelton et al., 2017).

1.2.2 Hypertension-classification

There are two main types of hypertension: primary and secondary. The former is much common than the latter and tends to deteriorate over years. Secondary high blood pressure (BP) is caused by other relevant diseases or using certain medicines and usually resolved when the original inducements were removed (World Health Organization, 2015).

1.3 Self-management and hypertension

1.3.1 Self-management-definition

Self-management in health care can be referred to a dynamic and positive process in which knowledge, positive attitudes, self-determination, self-regulation, discipline, empowerment and self-efficacy are needed to manage the disease and achieve a healthy life (Balduino, Mantovani, Lacerda, Marin, & Wal, 2016). Self-management also should be performed at multiple levels, including individuals, families, medical professionals, organizations and society (Balduino, Mantovani, Lacerda, Marin, & Wal, 2016).
1.3.2 Hypertension-self-management

During the period of handing with chronic diseases, especially like high blood pressure, patients are required to take action on change in their daily lives as the disease can affect both physical and psychological aspects and social status of the individual. Hypertensive patients must adopt a positive self-management behavior in order to improve health status (Novais, Conceic~ao, Domingos, & Duque, 2009). Meanwhile, self-management should be based on the unique needs of individuals in different periods of life, taking into account their own well-being, safety and autonomy (Balduino, Mantovani, Lacerda, Marin, & Wal, 2016).

1.4 Support-definition

Support means to give help or take measures to give assistance or comfort to somebody in difficulty or distress. In an article, support is defined as the interventions or advice from health-care professionals, especially the nurses, which were given to hypertension patients in behavior management and medication management (Balduino, Mantovani, Lacerda, Marin, & Wal, 2016).

1.5 The nurse’s role

Nurses have four fundamental responsibilities: to promote health, to prevent illness, to restore health and to alleviate suffering (International Council of Nurses, 2012). The nurses’ main responsibilities are to provide care with which the human values, beliefs and rights of individuals are respected for patients to alleviate suffering (International Council of Nurses, 2012). Nurses have played a key role with regard to enhancing patient’s ability of disease self-management, especially chronic disease, such as hypertension. On the one hand, nurses are the group who know the condition of patients’ disease completely and know the correct treatment for hypertensive patients. On the other hand, patients didn’t know the relevant knowledge and future development of hypertension, it is also essential for hypertensive patients to learn self-management of disease from nurses to manage their blood pressure in a more proper way (Balduino, Mantovani, Lacerda, Marin, & Wal, 2016).
1.6 Theoretical framework

Orem’s self-care nursing model describes three classifications of nursing systems: wholly compensatory, partly compensatory, and supportive educative (Rosmawati, Rohana, & Manan, 2013; Moore, Pawloski, Rodriguez, Lumbi, & Ailinger, 2009). The supportive educative nursing system is suitable for supporting the patient on improving their self-management when they seek to improve and control hypertension. As in the literature (Coster & Norman 2009), only education may not be enough to assist patients to manage themselves. Future developmental directions may also include exploring the results of care that depend on specific individual support for nursing interventions. These suggestions are consistent with Orem’s theory of further enhancement of the emotional component of supportive-educative methods of nursing (Orem, 1998).

1.7 Problem statement

Previous reviews have hardly described the importance of self-management. The patients does not know the future development of the disease (for example, when it appears, how long, how to prevent them, and how to ease) that results in self-managed care. In this study, the authors will focus on the content of self-management. In this study, however, the authors will focus on nurses' supports on self-management for hypertensive patients. It is extremely important for patient to get the ability of self-management on hypertension that enable them to improve their health status, including obtaining effective knowledge and forming a set of distinctive strategies. The supports from nurses have played an import role in facilitating this process.

1.8 Aim and research questions

The aim of this current study was to describe kind of support intervention and the effects of them on self-management for patients with hypertension and the samples used in the scientific articles, through the following questions:
1. What kind of support interventions on self-management have been conducted for patients with hypertension?

2. What effects have been reported of support interventions on self-management for patients with hypertension?

3. What are the characteristics of the participants in the scientific articles included?

2. Methods

2.1 Design

The authors conducted a descriptive literature review (Polit & Beck 2012).

2.2 Database

In this study, we did search in the database MedLine and Cinahl which are valuable for searching related articles about nursing studies (Polit & Beck 2012).

2.3 Search term and search strategies

When searching articles, the following search terms had been used: nurses, registered nurse; nurs*; nursing; support*; self care; self management; hypertension; high blood pressure; hypertensive. MeSH (Medline) and Hesding (Cinahl) were used to identify whether the search terms are relevant for aim. The search terms were used apart, and then combined to find the articles which were more consistent with aim. And the authors connected these search terms with the Boolean Operators “AND” and “OR” to shrunk the range of search results (Polit & Beck 2012).

Limitations were used in the search in order to get the articles which were related to the aim. In Medline, the following limits were used: “University of Gävle”, “10 years” and “full text”. In Cinahl, the following limits were used: “Linked full text” and “20070101-20171231”.
2.4 Selection process

Polit & Beck (2012) suggested that using exclusion and inclusion criteria to clarify the selection process and to work with the outcome of the databases searches more easier, which are presented below.

Exclusion criteria: Articles that did not complied with the aim of the study or that present the support from other medical staffs; articles could not be fetched from the University of Gävle.

Inclusion criteria: For articles that related to the aim of the review were included, and study using quantitative approach.

2.5 Outcome of database searches

The initial searches in the two databases generated 114 hits totally. And 5 articles were found by manual search, in total, the authors hit 119 articles. The outcome of the database searches, limitations, search terms, numbers of hits and chosen sources could be found in table 1. According to inclusion and exclusion criteria, the authors found 80 articles were not relevant to the review’s aim and research questions, 3 articles were double, an article was not in English. After reading the full articles, 21 articles were not relevant to the review’s aim and 9 articles were retained from databases finally (Figure 1). The manual search was first determined by reading the abstract of the articles from reference list that we included were relevant to this study. After reading the content of 5 articles which were related to the inclusion criteria of the study, only one article were retained. Totally, 10 articles were selected.

Table 1. Results of preliminary results of database search.

<table>
<thead>
<tr>
<th>Database + Limits</th>
<th>Search terms</th>
<th>Number of hits</th>
<th>Potential articles (excluding doubles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of search</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Database</td>
<td>Location</td>
<td>Search Terms</td>
<td>Results</td>
</tr>
<tr>
<td>------------</td>
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<td>------------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Medline</td>
<td>University of Gävle, full text, 10 years</td>
<td>Nurses[MH] OR registered nurse[tiab] OR nurs*[tiab] OR nursing[MH]</td>
<td>153779</td>
</tr>
<tr>
<td>PubMed</td>
<td>2017-05-24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medline</td>
<td>University of Gävle, full text, 10 years</td>
<td>Support*[full text]</td>
<td>3868667</td>
</tr>
<tr>
<td>PubMed</td>
<td>2017-05-24</td>
<td></td>
<td></td>
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<tr>
<td>PubMed</td>
<td>2017-05-24</td>
<td></td>
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</tr>
<tr>
<td>Medline</td>
<td>University of Gävle, full text, 10 years</td>
<td>Hypertension[MH] OR high blood pressure*[tiab] OR hypertensive[tiab]</td>
<td>69176</td>
</tr>
<tr>
<td>PubMed</td>
<td>2017-05-24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medline</td>
<td>University of Gävle, full text, 10 years</td>
<td>Combined four search terms with “AND”</td>
<td>62 18</td>
</tr>
<tr>
<td>PubMed</td>
<td>2017-05-24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cinahl</td>
<td>Linked full text, 20070101-20171231</td>
<td>Nurses[headings] OR registered nurses[headings] OR nurs*[all text] OR nursing[all text]</td>
<td>373974</td>
</tr>
<tr>
<td></td>
<td>2017-05-24</td>
<td></td>
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<tr>
<td>Database</td>
<td>Date</td>
<td>Type</td>
<td>Search Terms</td>
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<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Cinahl</td>
<td>2017-05-24</td>
<td>Linked full</td>
<td>Support*[all text]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>20070101-20171231</td>
</tr>
<tr>
<td>Cinahl</td>
<td>2017-05-24</td>
<td>Linked full</td>
<td>Self care[headings] OR self-management*[all text]</td>
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<td></td>
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<td></td>
<td>20070101-20171231</td>
</tr>
<tr>
<td>Cinahl</td>
<td>2017-05-24</td>
<td>Linked full</td>
<td>Hypertension[headings] OR “high blood pressure”*[all text]</td>
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<td></td>
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<td></td>
<td>20070101-20171231</td>
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<td></td>
<td></td>
<td></td>
<td>20070101-20171231</td>
</tr>
<tr>
<td>Manual</td>
<td>2017-06-18</td>
<td>University of Gävle, full text, 10 years</td>
<td>Relevance for inclusion criteria, aim and specific questions</td>
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<td>search of references</td>
<td></td>
<td></td>
<td>2017-06-18</td>
</tr>
</tbody>
</table>

119 Total: 35

[tiab]: title and abstract.
114 articles

80 articles were not relevant to the review’s aim and research question

34 articles reserved

3 articles were double

31 articles remained

1 article was not in English

30 articles persisted

When reading the full articles, 21 articles are not relevant to the review’s aim.

9 articles retained

1 relevant articles manual searched (5 relevant articles were identified from the references of selected articles while 4 of them were not consistent to the present review’s aim and search question)

Totally 10 articles included

Figure 1: Exclusion process of articles
2.6 Data analysis

The results parts of selected articles were dealt with in relation to research question 1 and question 2, and the methods section were related to research question 3. The authors first read all the articles separately and then read them together to discuss and summarize the support interventions and their effects. Tables were used to give an overview of articles. Appendix 1, table 2 summarized the selected articles’ authors, title, design and approach, sample, data collection method(s) and data analysis method(s), while Appendix 2, table 3 illustrated the selected articles’ authors, aim and results. The authors abstracted data independently and cross-checked for accuracy and agreement. If there were disagreements, reviewers discussed until they reached consensus. The data comprehensive was presented in a structured table and the relationship among ten studies were described in a conceptual map after searching for similarities and differences in the results.

2.7 Ethical considerations

The current literature reviews were based on published information and had been examined and ethically approved. Therefore, the authors believed that in the literature reviews, there were few ethical issues. Original articles were respected faithfully and objectively, although the articles had been analyzed and processed, the results were not changed subjectively. The authors discussed several times during the procedure of analysis and process, which helped the authors put forward the results objectively. In the whole procedure of the study, cheating and plagiarism were not allowed. When referring to the content, enough reference techniques could avoid the occurrence of plagiarism. This part of the description is made by Polit and Beck (2012).

3. Results

The results were based on 10 articles. The articles described the support interventions for self-management which nurses had to conduct for patients with hypertension and their effects. The results were displayed in the text as tables, as shown in table 2 and table 3.
Results connected to methodologies are presented in table 2 in text form. The results were based on a list of references in the Aserisk article (*).

The authors would present kind of support interventions, effects of support interventions and characteristics of the participants in the included studies below (Table 2-3 and Figure 2).

<table>
<thead>
<tr>
<th>Medication management intervention</th>
<th>Behavioral management intervention</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Diet intervention</td>
</tr>
<tr>
<td></td>
<td>Exercise management</td>
</tr>
<tr>
<td></td>
<td>Weight management</td>
</tr>
<tr>
<td>Telemonitoring and other</td>
<td>Stress intervention</td>
</tr>
<tr>
<td>telephone-based nurse care</td>
<td></td>
</tr>
<tr>
<td>interventions</td>
<td></td>
</tr>
<tr>
<td>Health education</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2: The themes and subheadings of the result

3.1 Kind of support interventions

3.1.1 Medication management intervention

During medication interventions, nurses suggested doctors on medication changes based on decision support software. Through support software, physicians and nurses evaluated patients' blood pressure, medication use, and adherence (based on patient reports and
prescription supplement data) and decided whether to change the hypertensive medication (Bosworth et al., 2007; Bosworth et al., 2011; Maciejewski et al., 2014).

Nurses would assess whether patients were familiar with the use of current prescription blood pressure medications, and whether any changes had occurred in their hypertension medications. If the patient didn’t know what the use of an hypertensive medication or how to take the medication in any case, the nurse would explain the purpose of each medication prescribed for that patient (Bosworth et al., 2008). If the patients reported a change in their blood pressure medications, the nurse would inform their primary care provider about the importance of changes in their blood pressure medication regimen (Bosworth et al., 2008). Nurses provided an opportunity to their family or friends to receive an overview of the patient's blood pressure medication (Bosworth et al., 2008). The principle of providing information to others was to help the patient strengthen medication and recorded his or her medication (Bosworth et al., 2008).

Nurses would call the patient three weeks after receiving the medication to obtain a report of adverse reactions and resolve the patient's problem (Maciejewski et al., 2014). When the patient's blood pressure was out of control, the nurses asked the patients if there was any adverse effect of the hypertensive medications. If the patients was experiencing adverse effect, the nurses would discuss the issue with the patient. If the patient was likely to have a life-threatening side effect, the nurses would contact doctors (Bosworth et al., 2007).

In a word, patients should take 100% adherence to medication regimen (Kauric-Klein 2012; Pezzin et al., 2010), medical staff provided medication management intervention with following principles: to encourage the use of a diuretic, to choose the combination of medications while avoiding the possible adverse effects, to avoid the lack of effectiveness of medication pooling and avoid the possibility that medications may aggravate other health problems. It indicated that the intervention help control blood pressure (Bosworth et al., 2007).

3.1.2 Behavioral management intervention

Behavioral management intervention and many different interventions were mentioned in 8 articles (Xue, F., Yao, W., & Lewin, 2008; Pezzin et al., 2010; Kauric-Klein 2012;
Diet intervention

Patients would be given a booklet on lowering blood pressure by cutting dietary sodium use. An effective dietary questionnaire was used in dietary assessment (Xue, Yao, & Lewin, 2008). The nurses would ask patients the food groups (meat, vegetables, fruits) which they had eaten in the past three months to assess the sodium they took. And the ion selective electrode (ISE) were used to assess sodium and potassium which from urine. The normal range of urine sodium 130~260 mmol/24h, urine potassium 25~100 mmol/24h, urine sodium divided by potassium equals urine sodium and potassium ratio (Xue, Yao, & Lewin, 2008 et al., 2008). In addition, nurses provided the information about some of the popular fast food menus contain sodium content, foods containing potassium and caffeine, and how to read the nutrients in the food (Bosworth et al., 2008).

Exercise management

Nurses provided the information that increasing physical activity can reduce blood pressure. The nurse first identified the current stage of the patient's movement and takes interventions according to different stages (Bosworth et al., 2007). For those who were not ready to exercise, nurses stressed the importance of exercise for lowering blood pressure, and set goals that individuals could achieve for them. Nurses also advised to focus on the benefits of the exercise and suggested family members or friends to provide support for hypertension patients. For those who prepared to change the level of activity, nurses offered various forms of activity that suits them, such as running (Bosworth et al., 2007). For those who had already started exercising, the nurse advised them to communicate with their doctors and developed appropriate exercise plans based on their age and physical fitness (Bosworth et al., 2007). The nurses also provided support and rewards according to set goals, documenting the progress of the exercise program.

Weight management

Weight management influenced the reduction of blood pressure. Weight intervention was directed at the patients whose Body mass index (BMI)>25 in an article (Bosworth et al., 2008). The nurses stressed the importance of maintaining a healthy weight and asked the patients about the phase of weight loss (not yet, prepared or already taken action)
(Bosworth et al., 2008). For those who were ready to begin to lose weight, nurses and patients worked together to plan their monthly plans, and were expected to encounter obstacles to prepare for the response. For patients who had taken action, nurses told patient that it was appropriate to lose two pounds a week (Bosworth et al., 2008). Find out the obstacles that patients encountered in the process of losing weight through motivational communication and help reduce barriers (Bosworth et al., 2008).

**Stress intervention**

While there were more evidences that stress made blood pressure go up in the short term, the long-term effects of stress were unclear (Bosworth et al., 2008). Nurses told them the importance of controlling stress by providing a relationship between blood pressure and stress, and ask what was the pressure stressful for them (Bosworth et al., 2007). The nurse provided suggestions to help reduce the pressure potentially (Bosworth et al., 2007).

### 3.1.3 Telemonitoring and other telephone-based nurse care interventions

Patients were encouraged to use the home blood pressure monitoring to provide objective information in order to motivate them to control their hypertension. Home monitoring also provided a record of medication efficacy and enabled rapid adjustment of treatment, which improved patient adherence to prescribed treatment and subsequent blood pressure control (Bosworth et al., 2007).

Telemonitoring was often implemented together with other measures. During a scheduled conference call, house calls nurse case managers provided self-administered education, medication and appointment reminders, as well as facilitating patient-doctor communication (Grilo et al., 2015). They also worked with each participant to create a customized goal. Target behaviors may include dietary changes, physical activity, weight loss, smoking cessation, stress reduction, self-monitoring of blood sugar and blood pressure, and medication adherence (Grilo et al., 2015). Nurse case managers evaluated barriers to patient behavior change, furthermore, employed behavioral problem solving and motivational interviewing techniques to support behavioral change (Grilo et al., 2015). At the end of each consultation, the nurses recorded manager records of the patients and...
communicates with the patient's doctor when needed. The length of the call was 15 to 45 minutes depending on the patient's needs (Grilo et al., 2015).

3.1.4 Health education

Educational talk was aimed at the patients involved in the study. Educational talk were consistent with the self-management handbook (the Hypertension Manual) used by community doctors to control blood pressure (Xue, Yao, & Lewin, 2008). The 5 parts of the Hypertension Manual were made into a pamphlet and sent to patients in the education talk(Xue, Yao, & Lewin, 2008).

The first part of the pamphlet was about the cause of hypertension, the underlying pathophysiology of end-stage hypertension, identifying the risk associated with end-stage hypertension, and dealing with the misunderstanding about the hypertension (Xue, Yao, & Lewin, 2008; Kauric-Klein, 2012; Bosworth et al., 2008; Bosworth et al., 2007).

The second part described the expectation lifestyle of a patient, including quit smoking, increase activity levels, lose weight, control alcohol consumption to moderate levels, reduce dietary sodium use, and eating detail to through self-care interventions / goals to demonstrate blood pressure control (Xue, Yao, & Lewin, 2008; Kauric-Klein, 2012; Bosworth et al., 2008; Bosworth et al., 2007; Park, Chang, Kim, & Kwak, 2012). At the same time, each participant provided a home blood pressure monitor, fluid log, a sodium intake list, and an educational booklet on sodium and liquid limitations to let them recorded in the one article (Kauric-Klein, 2012; Pezzin et al., 2010)).

The last three parts were medication compliance and lifestyle changes, with a diary recording of their daily blood pressure and weekly weight and waist circumference and a set of target tables through the action plan, where patients set and recorded their weekly goals (Xue, Yao, & Lewin, 2008; Pezzin et al., 2010; Kauric-Klein, 2012; Bosworth et al., 2008; Bosworth et al., 2007; Park, Chang, Kim, & Kwak, 2012). Then, every patients would encouraged or received praise with reporting their progress which they made by comparing the goal they set individually, for example, patient’s blood pressure at 3 months was reduced by at least 20 mmHg systolic blood pressure or 10 mmHg diastolic blood pressure relative to baseline levels. Besides, the use of a digital
sphygmomanometer, the calculation of BMI and the estimated food energy included in the programmer (Xue, Yao, & Lewin, 2008).

Two articles referred to patient-tailored counseling (Pezzin et al., 2010; Park, Chang, Kim, & Kwak, 2012). After each health education conference which focused on providing adequate knowledge and motivating self-management, geriatric nurse experts who were trained provided patient-tailored counseling to patients who were in the intervention group (Park, Chang, Kim, & Kwak, 2012). Participants acquired knowledge about hypertension self-management (HSM) from educational sessions. The patient-tailored counselling made patients to recognize their own problems of hypertension self-management (Park, Chang, Kim, & Kwak, 2012). Patient-focused counseling focused on developing strategic plans for patients to reduce blood pressure (Pezzin et al., 2010; Park, Chang, Kim, & Kwak, 2012).

3.2 The effects of nursing interventions on self-management

3.2.1 Medication management intervention

Six articles (Pezzin et al., 2010; Kauric-Klein 2012; Bosworth et al., 2008; Bosworth et al., 2007; Bosworth et al., 2011 & Maciejewski et al., 2014) mentioned referred to medication management intervention, they showed this intervention could improve medication compliance and reduce blood pressure (including SBP and DBP). An article described a combined intervention which combined medication management and behavioral management intervention and compared it with medication management and behavioral management intervention (Maciejewski et al., 2014). The article indicated that medication management could control and reduce blood pressure, its effect was better than behavioral management intervention but worse than combined interventions which combined medication management and behavioral management intervention (Maciejewski et al., 2014). However, in the other article, in the effect of reducing blood pressure, behavioral management intervention was better than medication management intervention (Bosworth et al., 2011). Three articles mentioned medication adherence in their charged behavioral and educational intervention, they all showed that behavioral and educational intervention could improve self-management of hypertension (such as...
medication adherence) to reduce blood pressure (Bosworth et al., 2007; Bosworth et al., 2011; Maciejewski et al., 2014).

### 3.2.2 Behavioral management intervention

Through behavioral intervention, hypertensive patients adjusted bad habits, increased exercise, controlled weight, relieved stress, increased medication compliance and had a healthier lifestyles (Bosworth et al., 2008; Bosworth et al., 2007; Bosworth et al., 2007). The group which increased physical activity lowered their blood pressure and improved the ability of controlling blood pressure (Xue, Yao, & Lewin, 2008). Suitable weight loss could provide adequate blood pressure control. Participants were more successful in meeting fluid goals than the BP goals during the intervention. Patients were most successful in achieving their sodium intake goals and met their goals, with the most common cause of decreased sodium intake (Kauric-Klein, 2012). With the help of the medical personnel, patient had more healthier lifestyles, knew how to control their blood pressure as much as possible (Xue, Yao, & Lewin, 2008). In an article, the patients reported to their team the progress they had made in their respective goals and were commended and encouraged by the panel lists before further targeting (Xue, Yao, & Lewin, 2008). Three articles showed that a simple cognitive behavioral self-management intervention could lead to clinically significant reductions in systolic and diastolic pressure (Xue, Yao, & Lewin, 2008; Kauric-Klein, 2012; Bosworth et al., 2008). Patients also reduced their waistline, weight loss, become more active and lower blood cholesterol (Xue, Yao, & Lewin, 2008). Patient-tailored counseling helped patients, both systolic and diastolic blood pressures significantly decreased when comparing with baseline in the intervention group (Park, Chang, Kim, & Kwak, 2012). Self-management behavior and exercise self-efficacy significantly improved when comparing from baseline to eight weeks later in patients with intervention group and better than patients who were in the comparison group (Kauric-Klein, 2012).
3.2.3 Telemonitoring and other telephone-based nurse care interventions

Two articles referred to an intervention including telemonitoring and other telephone-based nurse care interventions (Bosworth et al., 2009; Grilo et al., 2015). An article showed that the combined interventions which combined telemonitoring and other telephone-based nurse care interventions could reduce blood pressure more than telemonitoring alone, in addition, they could improve self-management of hypertension (for example, patients had the ability to monitor blood pressure and control blood pressure, and their medication adherence and exercise ability were improved) (Bosworth et al., 2009). In one of article, whether under telemonitoring alone or telemonitoring plused healthy education, food-secure patients’s blood pressure reduced, food-insecure patient’s blood pressure had no change (Grilo et al., 2015). On the basis of food safety, it could play a supporting role (Grilo et al., 2015).

3.2.4 Health education

Through education talks, patients had a certain understanding of the basic pathophysiology and risk factors of hypertension, knew that self-management was related to adjust blood pressure, and learned correct interventions and recorded blood pressure (Xue, Yao, & Lewin, 2008; Kauric-Klein, 2012). Besides, reduced waist circumference, reduced weight, became more active and reduced blood cholesterol, reduced systolic and diastolic pressures, improved medication compliance,enhanced self-management behaviour and exercise self-efficacy, and increased treatment group changes in medications (Xue, Yao, & Lewin, 2008; Kauric-Klein, 2012; Bosworth et al., 2008; Bosworth et al., 2007; Bosworth et al., 2009; Grilo et al., 2015; Park, Chang, Kim, & Kwak, 2012). Then, based on theoretical knowledge the patient took measures to control or lower blood pressure. In other words, the patient learned methods from health education, which controlled or lowered their blood pressure authentically (Xue, Yao, & Lewin, 2008).
3.3 Characteristics of the participants

Participants in these 9 articles were over the age of 18 (Xue, Yao, & Lewin, 2008, Kauric-Klein, 2012, Pezzin et al., 2010, Bosworth et al., 2008, Bosworth et al., 2009, Grilo et al., 2015, Bosworth et al., 2011, Park, Chang, Kim, & Kwak, 2012, Maciejewski et al., 2014), but age was not mentioned in an article (Bosworth et al., 2007). All of participants had hypertension, but there was no limit to their gender and the type of hypertension (Xue, Yao, & Lewin, 2008, Kauric-Klein, 2012, Pezzin et al., 2010, Bosworth et al., 2008, Bosworth et al., 2007, Bosworth et al., 2009, Grilo et al., 2015, Bosworth et al., 2011, Park, Chang, Kim, & Kwak, 2012, Maciejewski et al., 2014).

Participants in two articles were have complications, an article’ participants had diabetes or kidney disease, and another articles participants had type 2 diabetes (Pezzin et al., 2010, Grilo et al., 2015; Pezzin et al., 2010). However, in an article, participants were asked to have no complications (Xue, Yao, & Lewin, 2008). Participants had uncontrolled hypertension and they were diagnosed with hypertension for more than 12 months (Pezzin et al., 2010, Bosworth et al., 2007, Bosworth et al., 2011, Maciejewski et al., 2014, Bosworth et al., 2008, Bosworth et al., 2009, Park, Chang, Kim, & Kwak, 2012). Four articles (Bosworth et al., 2008, Bosworth et al., 2007, Bosworth et al., 2011, Maciejewski et al., 2014) required that participants were take anti-hypertensive medications, and two articles (Kauric-Klein, 2012, Park, Chang, Kim, & Kwak, 2012) required participants to have no cognitive impairment. Two articles (Kauric-Klein, 2012, Grilo et al., 2015) had language requirements for participants, participants could speak English in an article (Kauric-Klein, 2012) and they should be English-or Spanish-speaking people in another article (Grilo et al., 2015). An article (Park, Chang, Kim, & Kwak, 2012) referred to participants’ gender and marriage, 72% were women and 32% were married. The detailed characteristics of the participants could be found in Table 2.
4. Discussion

4.1 Main results

The results showed that nurses' self-management support for hypertensive patients was effective, and the supportive interventions mainly included medication management, behavior management, telemonitoring and health education.

Medication management assessed the patient's blood pressure, medication using, and adherence through software. According to the patient's BP log, nurses communicated with their home nurse and/or patient care professionals in order to adjust the medication. Nurses provided patients with knowledge of high blood pressure medications and blood pressure treatment programs. The principles were to help patients to strengthen medications and control blood pressure.

Behavioral management included diet intervention, exercise management, weight management, stress intervention and patient-tailored counselling. Besides, some interventions which were through telemonitoring and other telephone-based nurse care interventions were included. Behavioral management could reduce weight and cholesterol, increase activity amount, improve quality of life, and most of all, control blood pressure or reduce blood pressure.

Telemonitoring provided objective information. It was often used in combination with other interventions. Nurses often set targets for patients and test results to motivate them to control hypertension. Behavioral management and food safety also had effect on reducing blood pressure.

4.2 Results discussion

4.2.1 Nurse support for the self-management of hypertension patient

The authors collected a total of 10 articles, 8 articles mentioned behavioral management (Xue, Yao, & Lewin, 2008; Pezzin et al., 2010; Kauric-Klein 2012; Bosworth et al., 2008; Bosworth et al., 2007; Bosworth et al., 2009; Bosworth et al., 2007., & Maciejewski et al., 2014). They all showed that the behavioral management could control patient's blood pressure even reduce it. In addition, behavioral management could lose weight, reduce
cholesterol, increase activity level and enhance quality of life (Xue, Yao, & Lewin, 2008; Pezzin et al., 2010; Kauric-Klein 2012; Bosworth et al., 2008; Bosworth et al., 2007; Bosworth et al., 2009; Maciejewski et al., 2014; Grilo et al., 2015).

9 articles evaluated blood pressure, medication use and medication adherence through software (Xue, Yao, & Lewin, 2008; Pezzin et al., 2010; Kauric-Klein 2012; Bosworth et al., 2008; Bosworth et al., 2007; Bosworth et al., 2009; Grilo et al., 2015; Bosworth et al., 2011; Maciejewski et al., 2014). By monitoring the patient's BP diary, timely adjustments to medications can be made with their home nurse and/or patient management professional (Kauric-Klein, 2012). The intervention also informed patients about side effects of antihypertensive medication and medication use methods (Xue, Yao, & Lewin, 2008; Kauric-Klein 2012; Bosworth et al., 2008; Bosworth et al., 2009; Grilo et al., 2015; Maciejewski et al., 2014). Through intervention, some hypertensive patients had less medication treatment and improved medication compliance (Xue, Yao, & Lewin, 2008; Pezzin et al., 2010; Kauric-Klein 2012; Bosworth et al., 2008; Bosworth et al., 2007; Bosworth et al., 2009; Grilo et al., 2015, Bosworth et al., 2011; Maciejewski et al., 2014).

Telemonitoring and other telephone-based nurse care interventions encouraged hypertensive patients to use the home blood pressure monitoring and provide objective information to motivate them to control their hypertension. At the same time, the efficacy of the medication was recorded and the treatment plan could be rapidly adjusted, thereby improved the patient's compliance with the prescribed treatment and subsequent blood pressure controlled (Bosworth et al., 2009). Remote monitoring is usually implemented together with other measures. During a scheduled conference call, caregivers provided self-administered education to patients, medications and appointment reminders, and promoted patient-physician communication. They also set goals with each participant that may included dietary changes, physical activity, weight loss, smoking cessation, decompression, self-monitoring of blood glucose and blood pressure, and adherence to medication (Bosworth et al., 2009). Through intervention, the medication adherence of hypertensive patients increased, exercise capacity increased, and blood pressure is controlled or reduced (Bosworth et al., 2009; Grilo et al., 2015). Intervention in the food safety group played a role in lowering blood pressure, but it did not play a role in the food insecurity group.
The contents of the educational talk included the booklets of hypertension-related knowledge, the patient's expected lifestyle and change in medication compliance and lifestyle. And recorded their diary daily blood pressure, weekly weight and waist circumference, and a set of action plans. Established target tables, patient set and record weekly goals (Xue, Yao, & Lewin, 2008; Pezzin et al., 2010; Kauric-Klein, 2012; Bosworth et al., 2008; Bosworth et al., 2007; Park, Chang, Kim, & Kwak, 2012). After education talk, patients learned about hypertension, knew that self-management was related to adjusting blood pressure, and learning to correctly measure and record blood pressure (Xue, Yao, & Lewin, 2008; Kauric-Klein, 2012). Besides, it could reduce waist circumference, lose weight, become more active, lower blood cholesterol, reduce systolic and diastolic blood pressure, improve medication compliance, enhance self-management behavior and exercise self-efficacy (Xue, Yao, Lewin, 2008; Kauric-Klein, 2012; Bosworth et al., 2008; Bosworth et al., 2007; Bosworth et al., 2009; Grilo et al., 2015; Park, Chang, Kim, & Kwak, 2012).

Education courses and personal counseling were parts of behavior management, which could help patients understand the knowledge of hypertension and set the program for themselves according to their circumstances (Xue, Yao, Lewin, 2008; Kauric-Klein, 2012; Bosworth et al., 2008; Bosworth et al., 2007; Bosworth et al., 2009; Grilo et al., 2015; Park, Chang, Kim, & Kwak, 2012). Although medication management was better than behavioral management alone, it did not mean that separate behavior management was not important, the combination of medication management and good habits would be better (Maciejewski et al., 2014).

4.2.2 The necessity of support

The 10 articles included in this study could be used to investigate on knowledge of hypertension of patients and its medication treatment. Nurses contacted with patients for the longest time and nurses were the patient's condition of the observer, the medication's missionary, mentor and supervisor. Therefore, nurses should play their full role to provide high quality service for patients with hypertension. Orem’s self-care nursing model describes three classifications of nursing systems: wholly compensatory, partly compensatory, and supportive educative (Orem, 1998). In this review, nurses applied the
supportive educative system in Orem's theory. After the education and support provided by nurses, the self-management ability of patients had been improved (Xue, Yao, & Lewin, 2008). With the education and support provided by nurses, hypertensive patients had a certain understanding of the basic pathophysiology and related risk factors of hypertension. And it could help patients realize that healthy habits, exercise, control smoking and drinking, reduce stress and so on would improve the self-management of hypertension (Xue, Yao, & Lewin, 2008; Bosworth et al., 2008; Bosworth et al., 2007; Bosworth et al., 2009; Grilo et al., 2015; Maciejewski et al., 2014).

4.2.3 Compared with previous literature results

The authors found that telemonitoring could improve patients' self-management of hypertension, such as monitoring and reducing blood pressure, improving medication compliance and exercise capacity (Bosworth et al., 2009). The results were similar to AbuDagga’s article, and in AbuDagga’s article, telemonitoring could reduce blood pressure and have ability to monitor blood pressure (AbuDagga, Resnick, & Alwan, 2010). In the process of telemonitoring, patients can find change in blood pressure at any time. When the blood pressure rises, they will have the consciousness to control blood pressure. When the blood pressure is in the normal range, the patient will maintain normal living habits at that time. So the authors thought telemonitoring is beneficial to improve self-management and reduce blood pressure.

The results of this article about education intervention (Glynn, Murphy, Smith, Schroeder & Fahey, 2010) were similar to those found by the authors (Xue, Yao, & Lewin, 2008; Pezzin et al., 2010; Kauric-Klein, 2012; Bosworth et al., 2008; Bosworth et al., 2007; Park, Chang, Kim, & Kwak, 2012). Educational intervention could promote the understanding of hypertensive disease in hypertensive patients and enhance the control of blood pressure (Xue, Yao, & Lewin, 2008; Pezzin et al., 2010; Kauric-Klein, 2012; Bosworth et al., 2008; Bosworth et al., 2007; Park, Chang, Kim, & Kwak, 2012; Glynn, Murphy, Smith, Schroeder & Fahey, 2010). The purpose of health education is to raise the patient’s awareness of blood pressure, and to understand the harm of hypertension and the importance of controlling blood pressure. Patients will improve self-management and control blood pressure consciously. Therefore, the authors believed that it was
meaningful for hypertensive patients to obtain knowledge about controlling blood pressure through educational intervention.

4.3 Methods discussion

The authors work in a systematic manner and record each step of the search process recommended by Polit&beck (2012) to ensure effective search and to improve the reliability of research. The results are based on 10 quantitative articles consistent with the aims of the study.

In order to enhance the credibility of the findings, the authors set inclusion and exclusion criteria, and searched through different databases Cinahl and MedLine. It may help strengthen the results of this review. In addition to inclusion criteria and exclusion criteria, the author also requested that the articles be written in English and be published between 2007 and 2017. According to Polit&Beck (2012), the time span is a bit large, which is a limitation of the article without the latest or latest results. In literature search, a large number of articles are excluded simply by reading the title and the abstract. Some people may think that some articles will be excluded because the author did not read the material.

The authors used mesh and headings and used Boolean search operators to combine search terms and used free text searches to get more illuminating article results. The authors selected the article by reading the title and abstract of the article. In the end, the authors found 10 suitable qualitative articles.

According to the recommendations of Polit & beck (2012), to ensure that the author does not affect others' text interpretation and avoid the risk of important information loss. Reading the selected article was the first step. After this step, the author summarized and classified the support interventions and effect of them on self-management for hypertension mentioned in the article.

All selected articles in this study had been approved by the ethics committee. But different ethical committees require different ethical licenses, and different countries had different requirements.
The ten present literature were based on different countries: China, America and Korea, improving the global transformation of the study. The literature review shows the cultural background of different regions.

4.4 Clinical implications

The results of the present study focused on the importance of the support which nurses provided, the support can be knowledge, telemonitoring and so on. Support not only can help patients learn knowledge about hypertension, but also monitor and improve blood pressure. In practice, nurses’ support really help the patient. Patients acquire a lot of knowledge about hypertension and how to control blood pressure and they have self-management ability to manage blood pressure, more importantly, the patient's blood pressure tend to decrease. Nurses’ support is an effective means in a clinical context. However, due to hypertension is a chronic disease, besides, nursing intervention, the quality self-management and family social support are worthy of attention whenever hospitalized or discharged.

4.5 Suggestions for further research

After current literature review completed, we found that no published studies from Sweden have been found to answer the research questions in this study. In order to further highlight the importance of nurse in self-management of hypertensive patients, it is best to study it from the patient's point of view. From this perspective, one can identify their needs and difficulties and whether nurses are helpful to them. Earlier studies have shown that nurses have a role in the control of high blood pressure, but they can not know the patient's feelings. Patients should be surveyed while studying the effect, nurses can educate patients in psychological. This point is important for the future investigation.

4.6 Conclusion

Based on reading literature widely, the authors found that hypertension is largely seen as a controllable chronic disease, As long as hypertension is managed properly, it will not
impact the quality of your life. Support from nurses includes medication management, behavioral management, telemonitoring and health education, which can improve self-management of hypertensive patients and reduce their blood pressure. After their self-management ability is improved, blood pressure can also be effectively controlled.
References


### Table 2. Overview of the selected articles.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Title</th>
<th>Design and approach</th>
<th>Participant characteristics</th>
<th>Data collection method</th>
<th>Method of analysis</th>
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<tbody>
<tr>
<td>Xue et al.</td>
<td>A randomised trial of a 5 week, manual based, self-management programme for hypertension delivered in a cardiac patient club in Shanghai</td>
<td>A study of a quantitative approach with a randomised trial.</td>
<td>Number: 140 participants&lt;br&gt;Age: aged 18–69 years&lt;br&gt;Participants with mild-to-moderate primary hypertension (having systolic BP between 140 and 180 mm Hg and/or diastolic BP between 90 and 110 mmHg in accordance with patients’ medical records); with no evidence of serious co-morbidity.</td>
<td>Data was collected on 2 occasions after treatment, the 1st follow-up being 1 month after the end of treatment and the 2nd follow up being 4 months after the end of treatment. Using the International physical activity questionnaire (IPAQ) to collect information on physical activity. Diets was evaluated using a validated diet questionnaire and asked about food intake in the last three months to calculate the daily intake. For smoking, the frequency of the patient had smoked in The past 4 weeks were asked. To drink, the patients were asked if they</td>
<td>An intention-to-treat analysis, comparison of groups for changes in smoking and drinking were made using chi-squared tests.</td>
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have: 1-4 drinks per week or more than 5 drinks per week. Quality of life was assessed using the Medical outcomes study short form 12 health survey (SF12).

<p>| Kauric-Klein | Improving Blood Pressure Control in End Stage Renal Disease Through a Supportive Educative Nursing Intervention | A study of a quantitative approach with a 90-day randomized controlled design | Number: 130 participants | Age: older than 18 years. Participants had a four-week average pre-HD BP greater than 150 mm Hg or diastolic BP greater than 90 mmHg; could read and speak English; scored higher than 80 on the 3MS and/or less than 15 on the PHQ-9 (The 3MS was administered to participants to assess cognitive function, and the PHQ-9 test was administered to patients on chronic hemodialysis) units. | All data were collected by the investigator in the participants’ HD (hypertension in patients on chronic hemodialysis) units. | Descriptive statistics analysis and demographic information |</p>
<table>
<thead>
<tr>
<th><strong>Pezzin et al.</strong></th>
<th>Improving Blood Pressure Control: Results of Home-based Post-acute Care Interventions</th>
<th>A study of a quantitative approach with a cluster randomized controlled trial.</th>
<th>Number: 845 participants</th>
<th>Data collected from 3-month in-home interviews</th>
<th>Ordinary least squares and descriptive statistical analysis</th>
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<tr>
<td><strong>Year of publication:</strong></td>
<td>2010</td>
<td><strong>Country:</strong> USA</td>
<td>Age: aged 21 to 80 years</td>
<td>Black people. Participants with uncontrolled HTN determined by a primary, secondary, or tertiary admission diagnosis of HTN in the electronic health record and a BP at the time of the study recruitment interview of ≥140 mmHg systolic (SBP) and/or ≥90 mmHg diastolic (DBP); (≥130 mmHg SBP and/or ≥80 mmHg DBP for patients with diabetes or kidney disease).</td>
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<tr>
<th><strong>Bosworth et al.</strong></th>
<th>Take Control of Your Blood pressure (TCYB) study: A multifactorial</th>
<th>A study of a quantitative</th>
<th>Number: 636 participants.</th>
<th>Data collected via telephone.</th>
<th>Descriptive statistical analysis using the four-item</th>
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<td><strong>Year of publication:</strong></td>
<td>2008</td>
<td><strong>Age:</strong> average age = 60.5 years.</td>
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<tr>
<td>Country: United States</td>
<td>Tailored behavioral and educational intervention for achieving blood pressure control</td>
<td>Approach with a randomized controlled design</td>
<td>Participants in one of the two primary care clinics for at least 1 year and had a diagnosis of hypertension by an outpatient diagnostic code, and were using a hypertensive medication at the time of the baseline visit.</td>
<td>Morisky self-reported medication-taking Scale</td>
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<td>Bosworth et al.</td>
<td>Hypertension Intervention Nurse Telemedicine Study (HINTS): Testing a multifactorial tailored behavioral/educational and a medication management intervention for blood pressure control</td>
<td>A study of a quantitative approach with a randomized controlled design</td>
<td>Number: 600 participants. Age: No information about the participants’ age. Potentially eligible individuals are selected from patients who are enrolled in primary care in 1 of the 3 Durham VA general internal medicine clinics; who have a diagnosis of hypertension based on International classification of diseases, Ninth Revision, codes; and who are using a BP-</td>
<td>Data collected via telemonitoring devices over standard telephone lines. Time effect in the generalized linear mixed model, Hypertension Beliefs Questionnaire and descriptive statistical analysis.</td>
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lowering medication. An additional inclusion criterion is that patients are required to have inadequate BP control based upon the average of the prior 12-months of clinic BP recordings obtained from electronic medical records.

<p>| Bosworth et al. | Two Self-management Interventions to Improve Hypertension Control: A Randomized Trial | A study of a quantitative approach with a randomized controlled design | Number: 636 participants. Age: mean age was 61 years. Participants were diagnosed hypertension registered data at least 12 months; report currently taking anti-hypertensive medication; scheduled non-lab primary care provider appointment during the next 30 days and resident in Duke University Health System. At completion of the baseline face-to-face interview, a research assistant opened an envelope and recorded data and monitored for cardiovascular adverse events via medical record and patient report. | Sample size estimation; logistic mixed-effects regression model and general linear models |</p>
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<tr>
<th>Study</th>
<th>Year of Publication</th>
<th>Country</th>
<th>Study Title</th>
<th>Study Design</th>
<th>Number of Participants</th>
<th>Participant Characteristics</th>
<th>Data Collection Methods</th>
<th>Analytical Methods</th>
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<tr>
<td>Grilo et al.</td>
<td>2015</td>
<td>United States</td>
<td>Food Insecurity and Effectiveness of Behavioral Interventions to Reduce Blood Pressure, New York City, 2012–2013</td>
<td>A study of a quantitative approach with a randomized controlled design</td>
<td>28 participants.</td>
<td>Age: 18 years of age or older. Participants were 28 English- or Spanish-speaking men and women with uncontrolled hypertension and comorbid type 2 diabetes which were treated at least 6 months.</td>
<td>Collected data through self-report questionnaires and measurement</td>
<td>Linear multilevel repeated-measures regression analyses and intent-to-treat analysis</td>
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<td>Bosworth et al.</td>
<td>2011</td>
<td>United States</td>
<td>Home Blood Pressure Management and Improved Blood Pressure Control</td>
<td>A study of a quantitative approach with a randomized controlled design</td>
<td>591 participants.</td>
<td>Age: mean age was 64 years old. Participants with hypertension from in Durham, North Carolina, Veterans Affairs (VA), who had inadequate BP control and were using a BP-lowering medication. 48% participants were African American, and 92% of them were male.</td>
<td>Arranged an inperson meeting and conducted a baseline interview to get information.</td>
<td>A logistic mixed-effects regression model and longitudinal data analysis models with an unstructured Covariance.</td>
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<td>Study</td>
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<td>Park et al. (2012) Patient-tailored</td>
<td>A study of a quantitative approach with a</td>
<td>47 participants</td>
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<td>self-management intervention for older</td>
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<tr>
<td>Masiejewski et al. (2014) Do the Benefits</td>
<td>A study of a quantitative approach with a</td>
<td>591 participants</td>
<td>The trial</td>
<td>A logistic piecewise quadratic mixed-</td>
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<td>of Participation in a Hypertension Self-</td>
<td>randomized controlled design</td>
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<td>evaluated 3</td>
<td>effects regression model, the linear</td>
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<td>Management Trial Persist After Patients</td>
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<td>telemonitoring.</td>
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<td>Usual Care?</td>
<td>BP-lowering medication, and had inadequate BP control (&gt;140/90 mm Hg for all patients).</td>
<td>The trial evaluated 3 telephone-based interventions through a 4-group design.</td>
<td>piecewise quadratic mixed-effects model, a binomial distribution and logistic link function.</td>
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### APPENDIX 2

Table 3. Overview of selected articles’ aims and results.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Aim</th>
<th>Treatment/intervention for experimental and control group</th>
<th>Effects of treatment/intervention</th>
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<tbody>
<tr>
<td>Xue et al.</td>
<td>To assess the benefits of a simple cognitive and hypertension self-management program based on Hypertension Handbook, and to provide in the settings of the Community anti-Hypertension Club in Shanghai</td>
<td>The experimental group delivered in 4 small group sessions spread over 5 weeks, the final session were two weeks after the third session. Each small group comprised 10–12 patients, there being 6 groups in all. Each of the first three sessions lasted 2.5 hours, and the final session about 1 hour and an educational talk, goal setting for behaviors and patient led exercise session. Patients also were given a copy of the hypertension manual. The control group received a booklet that was given to all members of the anti-hypertension clubs explaining desirable behavioral change and giving</td>
<td>Physical activity increased more in the intervention group than in the control group. The intervention group had significant advantages in the average difference in quality of life scores. People in the intervention group had reduced medication treatment 4 months after the end of treatment. At least in the short term, a simple cognitive-behavioural self-management intervention can lead to clinically significant reductions in both systolic and diastolic blood pressure. Patients also reduced their waist circumference, lost</td>
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<td>Year of publication: 2008</td>
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<tr>
<td>Country: Shanghai, China</td>
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<td><strong>Kauric-Klein</strong></td>
<td><strong>Pezzin et al.</strong></td>
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<td><strong>Year of publication:</strong></td>
<td><strong>Year of publication:</strong></td>
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<td>2012</td>
<td>2010</td>
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<td><strong>Country:</strong></td>
<td><strong>Country:</strong></td>
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<td><strong>To provide an overview of how to support nursing intervention combined with monitoring, setting goals, strengthening blood pressure control in people with chronic hemodialysis and describe how to use self-efficacy, self-regulation, and self help to manage hypertension</strong></td>
<td><strong>To test the effects of two home-based interventions aimed at improving blood pressure in high-risk African-American patients.</strong></td>
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<td><strong>Treatment group received: two BP education sessions; 12-week monitoring, goal setting and reinforcement and a 30-day postintervention follow-up period. The control group received: standard care, which involved BP monitoring and medication adjustments by healthcare providers in the HD unit on a weekly basis as needed.</strong></td>
<td><strong>Usual care: All patients received usual acute home care, including a unified clinical and functional assessment, medication review and conciliation, care planning, patient/family education, monitoring, and tailored care. Hypertension patients who received augmented interventions improved blood pressure control stage 2 HTN receiving JNC7 treatment. Increased intervention increased the possibility of 3-month</strong></td>
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<td><strong>But there was no significant difference in diet behavior, smoking or drinking between the two groups.</strong></td>
<td><strong>important information about hypertension.</strong></td>
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</table>
Basic Intervention: Receives the "Low Blood Pressure" JNC7 patient guide, home blood pressure monitor, blood pressure log, and regular blood pressure recommendations, and shares the results with home care nurses and PCPs.

Augmented interventions: It deployed a trained “HTN (uncontrolled hypertension) support” nurse and health educator to help patients strengthen their self-management skills, adhere to recommended medications and behavioral therapy, communicate more effectively with their PCP, and collaborate with patients. Self-management goals, and the introduction of an interactive workbook containing HTN information and tools. During the 12-week biweekly telephone consultation meeting, the support team regularly checked the patient's BP log and, if necessary, communicated with the patient's blood pressure control and reduced systolic blood pressure compared to usual care. But compared to the usual care, the basic intervention did not show a significant improvement in overall or HTN severity patient outcomes, and no increased intervention resulted in a compared to significant improvement in the overall sample relative to augmented care.
Bosworth *et al.*  
**Year of publication:** 2007  
**Country:** United States  
**To evaluation of randomized controlled trials involving custom behavioral interventions to improve blood pressure control.**  
**Intervention group:** A conference call takes place approximately every 8 weeks. Each time a phone call comes in, a set of core interventions are activated. These interventions included medication management (adverse effects of and anti-hypertensive medication problems), memory, social support, knowledge/risk perception, healthy behavior (participatory decision making, diet, weight, exercise, stress, usage of alcohol and smoking), literacy, closure encounters and patient activated encounter.  
**Control group:** received no contact by the nurse.  
Both the control group and the intervention group have their blood pressure measured using a standardized protocol at 6-month intervals for 24 months (5 total measurement points).  
**Compared with the control group, patients who received the intervention had a greater increase in medication compliance.**
<table>
<thead>
<tr>
<th>Study</th>
<th>Year of publication</th>
<th>Country</th>
<th>Aim</th>
<th>Hypertensive patients were randomized to 4 arms: (1) control group—a group of hypertensive patients who receive usual care; (2) nurse-administered tailored behavioral intervention; (3) nurse-administered medication management according to a hypertension decision support system; (4) combination of the 2 interventions</th>
<th>Improvement</th>
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<tr>
<td>Bosworth et al.</td>
<td>2007</td>
<td>United States</td>
<td>The use of home blood pressure remote monitoring to identify the BP control is insufficient and then use these values to trigger the intervention of the patient.</td>
<td>Improve patient health behavior and treatment compliance. Usual care had no obvious effect, and medication-associated behavioral interventions had the best impact, followed by medication management and behavioral management.</td>
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<td>Bosworth et al.</td>
<td>2009</td>
<td>United States</td>
<td>To compare two self-management interventions (bi-monthly tailored nurse administered telephone intervention targeting hypertension-related behaviors and blood pressure monitoring consisting of measuring blood pressure three times per week) for participants</td>
<td>Behavioral intervention, home BP monitoring, and combined two interventions all can reduce BP (included SBP and DBP), and medication adherence and exercise were improved.</td>
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<tr>
<td>Study</td>
<td>Year of publication</td>
<td>Country</td>
<td>Objective</td>
<td>Description</td>
<td>Findings</td>
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<td>Grilo <em>et al.</em></td>
<td>2015</td>
<td>United States</td>
<td>To evaluate the influence of food insecurity on blood pressure reduction</td>
<td>Food-secure and food-insecure participants were randomly assigned to either 1) home blood pressure telemonitoring (HBPTM) alone; or 2) home blood pressure telemonitoring plus nurse case management (HBPTM + NCM): telemonitoring and nurses provide health education such as self-management education, medication treatment</td>
<td>For food-secure patients, home blood pressure telemonitoring (HBPTM) alone and home blood pressure telemonitoring plus nurse case management (HBPTM + NCM) both could reduce blood pressure; but for food-insecure participants, two interventions both no effect on blood pressure.</td>
</tr>
<tr>
<td>Bosworth <em>et al.</em></td>
<td>2011</td>
<td>United States</td>
<td>To determine which of 3 interventions (behavioral management, medication management and combined them) was most effective in improving blood pressure (BP) control</td>
<td>(1) behavioral management intervention; (2) medication management intervention; (3) combined behavioral management</td>
<td>Behavioral management, medication management and combined interventions all can reduce blood pressure.</td>
</tr>
<tr>
<td>Study</td>
<td>Year of publication</td>
<td>Country</td>
<td>Study design</td>
<td>Intervention</td>
<td>Results</td>
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<td>Park et al.</td>
<td>2012</td>
<td>Korea</td>
<td>To estimate the effects of a patient-tailored self-management intervention on blood pressure control and self-management behavior, exercise self-efficacy and medication adherence among Korean older hypertensive patients in a nursing home.</td>
<td>Health education: a patient-tailored counselling to make patient-tailored self-management interventions for every patients by research team who were trained.</td>
<td>Patient-tailored self-management interventions through patient-tailored counselling significantly reduced blood pressure and improved self-management behaviour and exercise self-efficacy in addition to medication adherence.</td>
</tr>
<tr>
<td>Masiejewski et al.</td>
<td>2014</td>
<td>Korea</td>
<td>To check clinical and economic outcomes 18 months after completion of a hypertension self-management trial.</td>
<td>(1) Telemedicine and home BP monitoring; (2) Behavioral management intervention which included knowledge of health behaviors to improve HSM, including information on salt intake, weight,</td>
<td>After 12 months, blood pressure was decreased by 6.6% and 10.1% in the medication management group and the combined group (combined behavioral management and medication management intervention), respectively. After 18 months, blood pressure was decreased by 17.1%, 20.2%, and</td>
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</table>
stress relief, smoking cessation, alcohol use and so on;

(3) Medication management intervention: the nurse decided whether or not to change the hypertension medication through the patient’s BP, medication and adherence;

(4) combined intervention and usual care: combined behavioral management and medication management intervention

20.4% in the behavioral group, medication management group and the combined group (combined behavioral management and medication management intervention), respectively.