

## Conference Paper

# The Effect of Hydrotherapy on Blood Pressure in Patients With Hypertension: A Literature Review

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**Abstract.**

Hypertension is often known as a silent killer and is characterized by a continuous increase in blood pressure in the arteries. Sometimes this is not felt, especially in the elderly where their body function decreases so much that it is usually only felt after complications occur. The research objective was to analyze the effect of hydrotherapy on blood pressure among patients with hypertension through a literature review. The data were collected by searching articles through Google Scholar, Science Direct, Biomed Central, NCBI, and ProQuest. The data were analyzed using thematic analysis. The data were then assessed using the Joanna Briggs Institute steps and data extraction was carried out. According to the findings, there are 4 different methods of giving hydrotherapy, namely using the warm foot soak method (17 articles), the sauna method (1 article), the whirlpool bath method (1 article), and the cryotherapy method (1 article). Each method of giving hydrotherapy gives different results. Based on the findings, it seems that hydrotherapy can reduce blood pressure in elderly people with hypertension. In addition, giving hydrotherapy by using warm water foot soaks can be particularly effective.

**Keywords:** hypertension, hydrotherapy, effect

## 1. Introduction

Hypertension or often known as the silent killer is an abnormal condition characterized by a continuous increase in blood pressure in the arteries and sometimes this is not felt, especially in the elderly where their body functions decrease so that they are usually only felt after complications occur [1]. Based on the results [2] shows the prevalence rate of Hypertension as measured by 34.1%, a sharp increase from 25.8% in 2013. in the age group 31-44 years (31.6%), age 45-54 years (45.3%), age 55-64 years (55.2%). Data from the World Health Organization (WHO) in 2015 showed around 1.13 billion people worldwide were affected by hypertension, in other words 1 in 3 people in the world was

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Published 15 September 2022

Publishing services provided by Knowledge E

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Selection and Peer-review under the responsibility of the ICMEDH Conference Committee.

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diagnosed with hypertension. So far, the number of people with hypertension continues to increase every year, it is estimated that by 2025 it will increase to 1.5 billion people who are affected by hypertension, and it is estimated that every year 9.4 million people die from hypertension and its complications [3].

Many factors that contribute to the occurrence of hypertension include risks that cannot be controlled (major) and risk factors that can be controlled (minor). According to [4] risk factors that cannot be controlled (major) such as heredity, gender, race and age. While the risk factors that can be controlled (minor) are obesity, lack of exercise or activity, smoking, drinking coffee, sodium sensitivity, low potassium levels, alcoholism, stress, work, education and diet. From these minor factors, such as lack of awareness of maintaining nutritional intake and lack of activity, the elderly is often obese, where there is an increase in blood fat levels (hyperlipidemia) so that it has the potential to cause narrowing of blood vessels (atherosclerosis). This narrowing trigger the heart to work harder to pump blood so that the needs of oxygen and other substances needed by the body can be met. This is what causes blood pressure to increase so that hypertension occurs [5].

An increase in blood pressure that lasts for a long time (persistent) and does not go away will cause complications that can lead to complications. Complications in patients with hypertension are often characterized by organ damage, this depends on how large the increase in blood pressure is and the length of time the condition is undiagnosed and untreated. The organs of the body that may be the target of this disease include damage to the kidneys (kidney failure), heart (coronary heart disease) and brain (causing stroke) [6]. In addition, hypertension can cause atherosclerotic plaques in the cerebral arteries and arterioles, which can lead to arterial occlusion, ischemic injury and stroke as a long-term complication [5]. Complications of hypertension cause about 9.4 deaths worldwide each year. Hypertension causes at least 45% of deaths due to heart disease and 51% of deaths due to stroke. Deaths caused by cardiovascular disease, especially coronary heart disease and stroke are expected to continue to increase to reach 23.3 million deaths in 2030 [6].

There are two ways to treat hypertension, namely using Pharmacology and Non-Pharmacology. Giving pharmacology in the form of antihypertensive drugs can help control blood pressure in the elderly, but the more the number of drugs consumed will increase the risk of side effects and drug interactions [7]. From the prevalence of hypertension of 34.1%, it was known that 8.8% were diagnosed with hypertension and 13.3% of people diagnosed with hypertension did not take medication and 32.3% did not take medication regularly. This shows that most people with hypertension are not aware

that they have hypertension so they do not get treatment immediately. According to data from the Indonesian Ministry of Health [6], there are several reasons why people with hypertension do not take medication, among others, because hypertension sufferers feel healthy or do not appear symptoms that hinder the sufferer's activities (59.8%), do not make regular visits to health service centers. already provided (31.3%), prefer to take traditional medicine (14.5%), use other therapies (12.5%), forget to take medicine (11.5%), cannot afford to buy medicine (8, 1%), side effects arise from the drugs consumed (4.5%), and the unavailability of hypertension drugs at health service centers in the area (2%).

In addition to the use of pharmacology to lower blood pressure, the use of complementary therapies can help to lower blood pressure. One of the efforts that can help lower blood pressure or control blood pressure in the elderly is by giving hydrotherapy (hydrotherapy). Hydrotherapy itself is a combination of the Greek words *hydor* (water) and *therapeai* (healing) is one method that can help cure, treat, or relieve blood pressure. Hydrotherapy is one of the basic methods of treatment widely used in natural medicine systems, which is also known as water therapy, aquatic therapy, pool therapy, and balneotherapy. There are several types of application of this therapy, one of which is by soaking the feet in warm water [8]. The use of hydrotherapy for hypertension has been carried out since ancient times, more precisely in the 19th century, where Vincent Priessnitz, the inventor of modern hydrotherapy, used this therapy to improve blood circulation, then Vincent's discovery attracted interest from America, then used hydrotherapy to treat hypertension. in patients in 213 hospitals in the years between 1840-1900.

The importance of using Hydrotherapy According to [9] is able to increase blood circulation to the skin surface. It can also restore the elasticity of the arteries and capillaries. Scientifically, warm water with a temperature of 32-35 ° C is declared to have a physiological impact on the body. Warm water can dilate blood vessels, so blood flow will be smoother. With smooth blood circulation, cells and tissues can get an adequate supply of nutrients and will avoid the risk of diseases associated with blockage of blood vessels such as hypertension. This therapy is classified as efficient, especially for the elderly, because its use is through an easier and cheaper method so that this therapy is able to have a positive effect, besides that water is a source of life that is easily found anywhere, thus making Hydrotherapy able to become a mainstay therapy, especially for lowering blood pressure in the elderly [10]. This therapy also has several other advantages, such as preventing flu, fever, and restoring energy to the body [11]. Warm water soaking hydrotherapy is one of the therapies that can help improve blood circulation, scientifically warm water has a physiological impact on the

body such as reducing edema, increasing muscle relaxation, reducing pain, increasing capillary permeability, providing warmth to the body so it is useful to help lower blood pressure. blood in hypertensive patients [9]. This has been proven by previous studies regarding the administration of hydrotherapy to lower blood pressure.

According to research [12], the administration of sauna-based hydrotherapy therapy or what is commonly called hot water baths can have a beneficial effect on the cardiovascular system, especially in the elderly with hypertension where on average before the study was conducted the population with systolic blood pressure was obtained. above 140 mmHg and diastolic pressure above 90 mmHg after giving hydrotherapy 5 times per week for 10 minutes, the average decrease in systolic blood pressure to 136 mmHg and a decrease in diastolic blood pressure to 77 mmHg. According to research conducted [10], giving hydrotherapy to hypertensive patients 5 times in 5 consecutive days for approximately 15 minutes by soaking the feet in warm water got significant results. Where the initial measurements obtained an average systolic blood pressure of 165 and a diastolic blood pressure of 101. After treatment, a decrease in systolic blood pressure was obtained by 151 mmHg, and a decrease in diastolic blood pressure to 92 mmHg. Based on this research, researchers are interested in analyzing or editing literature studies regarding the administration of hydrotherapy on blood pressure in patients with hypertension.

## 2. Methods

In this study using a literature review design (LR). The literature search was carried out in September – November 2020. The literature search in this literature review used databases in the form of Google Scholar / Google Scholar, Biomed Central, Science Direct, NCBI, and Proquest. Keywords in this literature review consist of: ("Hydrotherapy") AND ("Hypertension") OR ("Blood Pressure"). In this study to assess the quality of the journal, the researcher used an assessment instrument, namely, JBI (Joanna Briggs Institute) Checklist for Randomized Controlled Trials and Checklist for Quasi experimental Studies [13]. Data analysis in this study used qualitative analysis by simplifying, presenting data, comparing data, drawing conclusions and verifying each international and local journal sampled in this study [14].

### 3. Results

In this study, 20 journals were obtained which will include a database of 2450 articles from Google Scholar / Google Scholar, 220 articles from Science Direct, 17 articles from Biomed Central, 265 articles from NCBI, and 70 articles from Proquest.

**Table 1**

TABLE 1: Characteristics of Respondents Based on the Literature Used

No	Characteristics of Respondents	N	(%)
1	Total Respondents	20 Journals	100
2	Respondents with elderly All Respondents	15 Journals 5 Journals	75 25
3	Age 20 - 44 years 45 - 59 years 60 - 74 years 75 - 90 years	5 89 1119 432	0,3 5,4 67,9 26,2
4	Gender Male Female	557 1091	33,7 66,2
5	Continent Asian continent The African continent American continent	18 11	90 5 5

Based on Table 1, it can be concluded that the journals used as literature in this study were 20 journals (100%) and journals that focused their research on the elderly there were 15 journals (75%). In addition, it can be explained that the general description of respondents based on population is that the most respondents are in the age group of 60-74 years as many as 1119 (67.9%). Based on the characteristics of the respondents above, it can be concluded that women are more susceptible to hypertension than men, namely (66.2%).

#### 3.1. Journal analysis of the literature obtained:

1. Hydrotherapy is able to reduce blood pressure, especially in the elderly, this can be proven based on the literature, including: giving hydrotherapy using warm water foot soaks, saunas, whirl pool baths, and cryotherapy.
2. Giving different hydrotherapy, namely by using a sauna (using a room with a hot temperature), cryotherapy / or ice therapy (hydrotherapy using small pieces of ice wrapped in a dry towel then placed on the treated area), soaking the feet in warm water (ask the patient to sit and put their feet in a tub filled with warm water), whirl pool bath (ask the patient to soak in a pool filled with warm water that can rotate).
3. The hydrotherapy used includes the warm water foot soak method (85%), the sauna method (5%), the Whirl Pool Bath method (5%), and the Cryotherapy method (5%). The conclusion from the journals used as literature is that researchers use the

TABLE 2: Data Analysis.

No	Title and Author	Purpose	Population/Sample	Method	Result
1	Differences in Blood Pressure Before and After Warm Water Foot Soak Therapy in the Elderly at UPT Budi Agung Kupang Elderly Supporting Social Institution [15] [15]	To determine the difference in blood pressure before and after hydrotherapy was given	42 Respondents at the Budi Agung Kupang Elderly Social Care Center UPT, on 27 June – 27 July 2016.	Quasi Experiment	Measurements were made before and after therapy, blood pressure measurements before being given therapy were systolic reaching 141 mmHg, diastolic reaching 90 mmHg. After being given there was a decrease in blood pressure, systolic to 125 mmHg, diastolic to 77 mmHg.
2	Hydrotherapy Effectiveness to Decrease Blood Pressure in Elderly Patients with Hypertension in Al-Islah Nursing Home Malang [11][11]	To determine the effectiveness of hydrotherapy to reduce blood pressure in the elderly	20 elderly (70-85 years old) with hypertension at the Al-Islah Nursing Home in Malang	Quasi Experiment	Results: 3 elderly with hypertension grade 1 (SBP between 140-159 mmHg, DBP between 90-99 mmHg), and 7 elderly people with grade 2 (SBP 160 mmHg, DBP 100 mmHg). After 6 days of therapy, it was found that 5 elderly had normal blood pressure (SBP <120 mmHg, DBP <80 mmHg), 3 elderly had hypertension, SBP was between 120-139 mmHg, DBP was between 80-89 mmHg), and 2 elderly still had hypertension. at grade 1 (SBP between 140-159 mmHg, DBP between 90-99 mmHg).
3	Effectiveness of Combination of Progressive Muscle Relaxation and Warm Water Foot Soak on Blood Pressure of Hypertensive Patients [16][16]	The purpose of this study was to determine the effectiveness of the combination of progressive muscle relaxation and foot soak in warm water on the blood pressure of hypertensive patients in the working area of Gamping 2 Public Health Center Yogyakarta.	56 Respondents at Puskesmas Gamping 2 Yogyakarta	Quasi Experiment	Measurements were taken before and after therapy, and it was found that there was a decrease in systolic blood pressure from 149 mmHg to 132 mmHg, Diastolic blood pressure from 97 mmHg to 82 mmHg.

method of giving with warm water foot soaks than other methods, because this

TABLE 2: (Continued).

No	Title and Author	Purpose	Population/Sample	Method	Result
4	Habitual hot water bathing protects cardiovascular function in middle-aged to elderly Japanese subjects [12][12]	Discussing the benefits of hydrotherapy on the cardiovascular system	873 Visitors to hot springs (sauna/onsen) from February 2006 to December 2013.	Quasi Experiment	Measurements were taken before and after therapy, and it was found that there was a decrease in systolic blood pressure from 140 mmHg to 136 mmHg, Diastolic blood pressure from 90 mmHg to 77 mmHg.
5	The Effect of Hydrotherapy (Warm Foot Soak) on Blood Pressure Reduction in Hypertensive Patients in the Work Area of the Sikumana Health Center, Kupang City [17][17]	To determine the effect of giving hydrotherapy, we discussed the effect of giving hydrotherapy (warm foot soak) on reducing blood pressure in hypertension patients in the Sikumana Health Center, Kupang City.	30 respondents in the Work Area of the Sikumana Health Center, Kupang City	Quasi Experiment	Measurements were taken before and after therapy, and it was found that there was a decrease in systolic blood pressure from 144.33 to 131.00 mmHg, Diastolic blood pressure from 91.00 mmHg to 83.00 mmHg.
6	The Effect of Warm Water Therapy on Lowering Blood Pressure in the Elderly with Hypertension [18][18]	To find out the effect of giving warm water therapy to reducing blood pressure in the elderly with hypertension	28 respondents at the Tambaksari Posyandu	Quasi Experiment	Measurements were taken before and after therapy, and found a decrease in systolic blood pressure from 170 mmHg to 155.36 mmHg, diastole from 90.36 mmHg to 84.64 mmHg.
7	Comparison of Giving Warm Water Soaking Hydrotherapy and Acupressure Massage on Blood Pressure in Patients with Primary Hypertension [19][19]	To find out the comparison of giving warm water bath hydrotherapy and acupressure massage to blood pressure in patients with primary hypertension	32 respondents at PSTW Khusnul Khotimah Pekanbaru.	Quasi Experiment	Measurements were taken before and after therapy, and it was found that there was a decrease in systolic blood pressure from 144 mmHg to 133 mmHg, Diastolic blood pressure from 87 mmHg to 81 mmHg.
8	Foot soak therapy using warm water is effective in lowering blood pressure in the elderly [20][20]	to test the effectiveness of Hydrotherapy on lowering blood pressure in the elderly	20 respondents	Quasi Experiment	Measurements were taken before and after therapy, and there was a decrease in systolic blood pressure from 183 mmHg to 147 mmHg, Diastolic blood pressure from 96 mmHg to 74 mmHg.

TABLE 2: (Continued).

No	Title and Author	Purpose	Population/Sample	Method	Result
9	The Effect of Hydrotherapy on Blood Pressure of the Hypertensive Patients in Public Hospital of RA Kartini Jepara [10][10]	To find out the effectiveness of Hydrotherapy to lower blood pressure at RA Kartini Hospital Jepara	20 Respondents at RA Kartini Hospital Jepara	Quasi Experiment	Measurements were taken before and after therapy, and there was a decrease in systolic blood pressure from 165 mmHg to 151 mmHg, Diastolic blood pressure from 101 mmHg to 92 mmHg.
10	The Effectiveness of Warm Water Foot Soak on Lowering Hypertension Blood Pressure in the Elderly Posyandu, Kec. Kismantoro Kab. Wonogiri [21][21]	To determine the Effectiveness of the Warm Water Foot Soak on Lowering Hypertension Blood Pressure in the Elderly Posyandu, Kec. Kismantoro Kab. Wonogiri	16 Respondents at Posyandu Elderly Kec. Kismantoro Kab. Wonogiri	Quasi Experiment	After being given hydrotherapy, significant results were obtained where there was a decrease in blood pressure. 3 respondents found systolic blood pressure of 125 mmHg, blood pressure of 130 mmHg for 7 respondents, blood pressure of 135 mmHg for 2 respondents, blood pressure of 140 mmHg for 4 respondents. Meanwhile, the diastolic blood pressure was obtained by 7 respondents, the number of respondents was diastolic blood pressure post test 70 mmHg, blood pressure 75 mmHg as many as 1 respondent, blood pressure 80 mmHg as many as 8 respondents.
11	The Effect of Foot Bath Therapy Using Warm Water Toward the Changes of Blood Pressure in Elderly with Hypertension in Amanah Elderly Group [22][22]	To find out the effect of foot soak hydrotherapy using warm water effectively lowers blood pressure in the elderly at Poslansia Amanah Klaten	37 respondents at Poslansia Amanah Klaten, in April 2019	Quasi Experiment	Measurements were made before and after therapy, and a decrease was found. In the measurement before being given therapy, it was found that 15 elderly suffered from mild hypertension, 15 elderly suffered from moderate hypertension, 6 elderly suffered from severe hypertension, 1 elderly suffered from malignant hypertension. After being given therapy, 24 elderly had mild hypertension, 10 elderly had moderate hypertension, 2 elderly had severe hypertension, 1 elderly had malignant hypertension.



TABLE 2: (Continued).

No	Title and Author	Purpose	Population/Sample	Method	Result
12	Influence of Warm Water Foot Soaking to Decrease Blood Pressure in Elderly with Hypertension in the Working area of Puskersma Rasau Jaya of Kubu Raya Regency [23][23]	The purpose of this study was to determine the effect of giving foot soak therapy using warm water to effectively reduce blood pressure in the elderly in the working area of the Rasau Jaya Public Health Center, Kubu Raya Regency.	28 respondents in the working area of the Rasau Jaya Health Center, Kubu Raya Regency	Quasi Experiment	The results of measurements before therapy were obtained were 17 elderly with hypertension grade 1 and 11 elderly hypertension grade 2. After being given therapy, 1 elderly blood pressure became normal, 3 elderly had normal high blood pressure, 14 elderly had hypertension grade 1, and 10 elderly had hypertension grade 2. The pretest TDS measurement was obtained between 140-174, and the pretest TDD measurement was obtained between 80-105. After being given therapy, there was a decrease in TDS between 120-172, and TDD between 80-100.
13	The Effect of Soaking Feet with Warm Water on Blood Pressure Reduction in Hypertension Patients in Timbangan Village in 2017 [24][24]	The purpose of this study was to determine the effect of foot soaking with warm water on reducing blood pressure in hypertension sufferers in Timbangan Village	15 respondents in Timbangan Village from October 2016 to August 2017.	Quasi Experiment	Measurements were taken before and after being given therapy, and obtained before being given therapy 5 elderly people with stage 1 hypertension, and 10 elderly people with stage 2 hypertension. 1, and 2 elderly with hypertension stage 2
14	Effect of Cryotherapy versus Transcutaneous Electrical Nerve Stimulation on Patients with Hypertension [25][25]	To Knowing the effect of giving cryotherapy in hypertensive patients	40 respondents at Disuq General Hospital, Disuq, Kfr El-Shiekh	Quasi Experiment	From the results of this study it can be concluded that the therapy given was able to reduce blood pressure but not significantly.

foot soak method is more efficient and easier to apply than other methods, only by using a tub filled with warm water.

4. Based on the results of the analysis of the 20 journals used, it can be concluded that hydrotherapy is able to reduce blood pressure in the elderly with hypertension, especially the administration of hydrotherapy with the warm water foot soak method which can be proven in research journals.

TABLE 2: (Continued).

No	Title and Author	Purpose	Population/Sample	Method	Result
15	Warm Water Hydrotherapy on Lowering Blood Pressure in Elderly Patients with Hypertension at Tresna Werdha Senjarawi Social Homes, Bandung [26] [26]	This study aims to determine the effect of giving hydrotherapy to reduce blood pressure in the elderly at the Tresna Werdha Senjarawi Social Institution, Bandung	35 respondents at the Tresna Werdha Senjarawi Social Home in Bandung in April 2016	Quasi Experiment	The results were obtained: the average systolic blood pressure was 150 mmHg and the average diastolic blood pressure was 90 mmHg before giving therapy, after being given therapy there was a decrease in systolic pressure to 140 mmHg and diastolic blood pressure to 70 mmHg.
16	Heated water-based exercise training reduces 24-hour ambulatory blood pressure levels in resistant hypertensive patients: A randomized controlled trial (HEx trial) (Guimaraes, De Barros Cruz, Fernandes-Silva, Dorea, & Bocchi, 2015)[27]	To determine the effect of giving hydrotherapy in patients with hypertension at the São Paulo hospital	32 respondents in São Paulo hospitals	Randomized Controlled Trial	The results obtained: measurement of systolic blood pressure of 160 mmHg, and diastolic blood pressure of 82 mmHg before being given therapy. After being given warm water bath therapy, the systolic blood pressure decreased to 136 mmHg and diastolic blood pressure to 76 mmHg.
17	The Effect of Foot Soak Hydrotherapy Using Warm Water on Blood Pressure Reduction in Hypertension Patients in Nyatnyono Village, Ungaran Barat District, Semarang Regency [28][28]	This study aims to determine the effect of giving warm water hydrotherapy on reducing blood pressure in hypertension sufferers in Nyatnyono Village, West Ungaran District, Semarang Regency.	36 respondents in Nyatnyono Village, West Ungaran District, Semarang Regency	Quasi Experiment	Measurements were taken before and after therapy, and found a systolic blood pressure of 138 mmHg and a diastolic blood pressure of 90 mmHg before being given therapy, after being given warm water soaking therapy there was a decrease in systolic blood pressure to 133 mmHg and diastolic blood pressure to 85 mmHg.

TABLE 2: (Continued).

No	Title and Author	Purpose	Population/Sample	Method	Result
18	The Effect of Warm Water Foot Soak on Blood Pressure Reduction in the Elderly in Jati Blimbing Village RT 3 RW 1 Dander District, Bojonegoro Regency [9][9]	To find out about the Effect of Warm Water Foot Soak on Blood Pressure Reduction in the Elderly in Jati Blimbing Village, RT 3 RW 1, Dander District, Bojonegoro Regency.	25 respondents in Jati Blimbing Village RT 3 RW 1 Dander District, Bojonegoro Regency	Quasi Experiment	Measurements were taken before and after therapy, and obtained measurements of systolic blood pressure of 164 mmHg and diastolic blood pressure of 87 mmHg before being given therapy, after being given warm water foot soak therapy, there was a decrease in systolic blood pressure to 151 mmHg and diastolic blood pressure to 81 mmHg.
19	The Effect of Foot Soak Using Warm Water on Blood Pressure Reduction in Hypertension in the Work Area of the Pattallassang Health Center, Kab. Takalar [29][29]	to finds out about the effect of foot soak using warm water on reducing blood pressure in hypertension patients in the work area of the Pattallassang Health Center, Kab. Takalar	15 respondents in the Work Area of the Pattallassang Health Center, Kab. Takalar	Quasi Experiment	The results obtained: before being given therapy blood pressure in 3 respondents reached 180/115 mmHg, 2 respondents reached 170/118 mmHg, 8 respondents reached 160/120 mmHg, and 2 respondents reached 150/118 mmHg. After being given warm water soak therapy, it was found that 2 respondents had their blood pressure decreased to 150/80 mmHg, 6 respondents became 140/90 mmHg, and 7 respondents became 130/80 mmHg.
20	Application of Foot Soak Therapy Using Warm Water in Lowering Blood Pressure [30][30]	To find out about the Application of Foot Soak Therapy Using Warm Water in Lowering Blood Pressure in elderly couples in the work area of the Pancoran District Health Center, South Jakarta.	An elderly couple in the working area of the Pancoran District Health Center, South Jakarta.	Quasi Experiment	Measurements were taken before and after being given therapy, and a significant difference was found

## 4. Discussion

The results after analyzing 20 journals found that some of the effects of giving hydrotherapy to lower blood pressure in the elderly with hypertension. The findings will be explained in the following explanation.

### 4.1. Effect of Hydrotherapy to lower blood pressure in the elderly with hypertension

The results of the literature study obtained, it can be concluded that hydrotherapy is able to reduce blood pressure, especially in the elderly with hypertension. This was found in 20 journals (100%) which were used as literature in this study. Based on the results of research from 20 journals used as literature, it was found that there were significant differences between the several methods used, the significant difference in question was how much decrease in systolic and diastolic blood pressure was given after hydrotherapy was given. This difference is influenced by the method or method of administering hydrotherapy to patients or the elderly with hypertension.

In administering hydrotherapy using cryotherapy, it was found that administration with cold water or ice therapy was able to reduce blood pressure but not significantly, this can be seen from the outcome of his research where the initial measurement of systolic blood pressure was 151 mmHg and diastolic blood pressure was 94 mmHg. After being given ice water hydrotherapy, the systolic blood pressure was 149 mmHg and the diastolic blood pressure was 89 mmHg.

Based on the literature journals obtained, it was found that the method of giving Hydrotherapy, researchers tended to use the warm water foot soak method as many as 17 journals (85%), sauna method 1 journal (5%), Whirl Pool Bath method 1 journal (5%), and method Cryotherapy 1 journal (5%). According to Gito (2016), this warm water foot soak therapy is efficient, especially for the elderly, because its use is through an easier method and does not require expensive costs because the provision of this method is considered very simple and natural because it has a very easy treatment method that can be done independently. does not require expensive equipment, is free from toxic substances and can be done anywhere, besides this therapy has the benefit of improving sleep quality in the elderly, giving a feeling of relaxation and calm, does not cause pain but can help eliminate disease in a very fast tempo, so that This therapy is able to have a positive effect on the elderly both in terms of health and financial factors.

Based on the Journal Analysis used, it was concluded that the administration of hydrotherapy using the foot soak method provides more effective results for lowering blood pressure in the administration of hydrotherapy using warm water foot soaks, this can be proven by the results of research conducted [11, 18, 20, 21].

Hydrotherapy (warm foot soak) is able to lower blood pressure because in the process of working hydrotherapy can cause vasodilation or make blood vessels relax and wide so that the effect given by hydrotherapy in the body results in a decrease in blood pressure. According to [18] administration with the foot soak method using warm water is able to stimulate the nerves in the feet to stimulate baroreceptors, baroreceptors are the main reflex in regulatory control to maintain mean arterial blood pressure. Baroreceptors receive stimulation from pressure located in the aortic arch and carotid sinus. When there is stretching of the arteries due to increased blood pressure, these receptors quickly send impulses to the vasomotor center and cause dilation of blood vessels in the arterioles and veins, resulting in changes in blood pressure.

In addition, there are other opinions according to [9] regarding the importance of using hydrotherapy, which is able to increase blood circulation to the skin surface. It can also restore the elasticity of the arteries and capillaries. Scientifically, warm water with a temperature of 32-35 ° C is declared to have a physiological impact on the body. Warm water can dilate blood vessels, so blood flow will be smoother. Giving warm water foot soak hydrotherapy is more effective in lowering blood pressure due to the direct contact between the therapy and the patient's body or the elderly. Direct contact in terms of water and feet, where the elderly soak their feet directly in warm water, is different from saunas that use room temperature, whirl pool baths that use cold water, and cryotherapy that uses ice water.

#### **4.2. Hydrotherapy Administration Method used in the study**

In research journals used as literature, it was found that there are 4 different methods of giving hydrotherapy from the many existing methods of giving hydrotherapy, namely using the warm foot foot soak method, the sauna method (room with a hot temperature), the whirl pool bath method (using a pool). and cryotherapy methods (using cold water). Researchers only used these 4 methods because, in general, the use of hydrotherapy delivery methods other than those used by researchers are almost the same, so the 4 methods used in this study can represent other hydrotherapy administration methods.

In addition, according to [11] in his research journal about the administration of hydrotherapy using the warm water immersion method compared to other methods,

namely due to limited tools, where hydrotherapy using warm water baths does not require a lot of materials or tools, this is according to the explanation [18] related to the main purpose of hydrotherapy, namely efficient therapy, especially for the elderly, using an easy method and can be done independently and does not require expensive costs but has tremendous benefits for lowering blood pressure so that therapy This is able to have a positive effect on the elderly both in terms of health and financial.

## 5. Conclusion

The results of the analysis of the journal giving Hydrotherapy to the blood pressure of the elderly with hypertension used as literature in this study, it can be concluded that Hydrotherapy is able to reduce blood pressure in the elderly with hypertension, this can be proven from the results of the Outcome Journal research used in this literature study. The warm water foot soak hydrotherapy method has more significant benefits for lowering blood pressure than other therapeutic methods, because there is direct contact between warm water therapy and the patient's body. Hydrotherapy Cryotherapy method can lower blood pressure, but the reduction is considered less significant.

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