

Jurnal Info Kesehatan

Vol. 23, No. 4, Desember 2025, pp. 912-923

P-ISSN 0216-504X, E-ISSN 2620-536X

DOI: [10.31965/infokes.Vol23.Iss4.1915](https://doi.org/10.31965/infokes.Vol23.Iss4.1915)

Journal homepage: <https://jurnal.poltekkeskupang.ac.id/index.php/infokes>



RESEARCH

Open Access

Application of Orem's Self-Care Theory in Lowering Blood Pressure in Hypertension Patients Grade 1 Through Resistance Band Exercise and Almond Chocolate Consumption

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Received: 10 February 2025

Revised: 10 June 2025

Accepted: 21 December 2025

Abstract

Self-care plays a critical role in the prevention and management of hypertension. This study aimed to evaluate the impact of Orem's Self-Care Theory on blood pressure reduction through resistance band exercise and almond chocolate consumption in hypertension patients. A quasi-experimental pretest-posttest control group design was used. The study involved 76 respondents with hypertension grade 1, divided into intervention and control groups. The intervention group participated in resistance band exercises three times a week for 28 days and consumed almond chocolate, while the control group received standard antihypertensive treatment. Data analysis was conducted using the Wilcoxon and Mann-Whitney tests with $\alpha < 0.05$. The results showed a significant reduction in both systolic ($p = 0.000$) and diastolic ($p = 0.002$) blood pressure in the intervention group. Resistance band exercises enhanced vascular endothelial function, while almond chocolate stimulated nitric oxide synthesis, leading to vasodilation. These intervention aligned with Orem's Self-Care Theory, highlighting the importance of individual commitment to health. The innovative aspect of this study lies in its integrated approach, as it is among the first to combine Orem's Self-Care Theory with both physical (resistance band exercise) and nutritional (almond chocolate consumption) interventions for hypertensive patients. The study concludes that applying Orem's Self-Care Theory through exercise and dietary changes effectively reduces blood pressure in hypertensive patients. It is recommended that health practitioners incorporate these self-care practices alongside the Patient-Centered Care (PCC) concept to address individual needs. This integrated approach can enhance hypertension management, improve blood pressure control, and boost patient satisfaction, ultimately leading to better health outcomes.

Keywords: Hypertension, Orem's Self-Care Theory, Resistance Band Exercise, Almond Chocolate Consumption.

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1. INTRODUCTION

Hypertension is the leading cause of death worldwide and a major risk factor for mortality and morbidity (Verma et al., 2021). The increasing burden of hypertension at the global level is particularly evident in Southeast Asia and the Western Pacific. The number of cases has risen significantly by up to 144% over the past three decades (Kario et al., 2024). Hypertension is a major risk factor for cardiovascular disease (Boateng & Ampofo, 2023). Hypertension management is crucial to reducing the risk of heart disease, stroke, and premature death. According to the Indonesian Health Survey, the prevalence of hypertension in individuals aged ≥ 18 years has decreased from 34.1% to 30.8%. Nevertheless, hypertension remains the most prevalent non-communicable disease (Kementerian Kesehatan Republik Indonesia, 2023).

Long-term hypertension can lead to left ventricular hypertrophy, resulting in both systolic and diastolic heart failure. Eccentric hypertrophy increases myocardial oxygen demand, potentially triggering angina or ischemic symptoms. Changes in heart muscle structure can disrupt conduction pathways, increasing the risk of atrial fibrillation, which can lead to ischemic stroke. Acute blood pressure fluctuations may also cause intracerebral haemorrhage or retinopathy (Tackling, 2023). The impact of high blood pressure serves as a warning for patients, as previous studies have shown that uncontrolled hypertension can increase the likelihood of stroke by sevenfold, congestive heart failure by sixfold, and heart attack by threefold (Feriani, Glorino, & Pandin, 2022).

Hypertension requires lifelong management (Burnier, Polychronopoulou, & Wuerzner, 2020). Hypertension management includes both non-pharmacological and pharmacological therapies (Oliveros et al., 2020). Although pharmacological treatment has proven effective in lowering blood pressure, healthy lifestyle changes, such as a balanced diet and increased physical activity, should still be considered as part of hypertension management (Oparil et al., 2018). Lifestyle modification plays a key role in managing hypertension (Bulto et al., 2024). Regular physical activity, weight control, smoking cessation, stress reduction, and a healthy diet are first-line treatments (Unger et al., 2020). Adopting a healthy lifestyle can reduce blood pressure by 4-5 mmHg, enhance the effectiveness of antihypertensive medication, and reduce the number of drugs needed to control blood pressure (Mancia et al., 2023).

Lifestyle modifications can reduce hypertension complications. Patients with hypertension need to engage in self-care, such as adherence to medication and lifestyle changes, to improve self-care management (Konlan & Shin, 2023). Despite the importance of lifestyle modifications, patient adherence remains low, increasing the risk of cardiovascular complications like coronary heart disease. Self-care has the potential to be a primary aspect of hypertension prevention and management. Hypertension patients can adopt self-care as a dynamic process involving knowledge, attitudes, commitment, self-control, resilience, and self-efficacy. The theory emphasizes the importance of self-care and the role of nurses in assisting individuals who are unable to meet their own care needs (Nasresabetghadam et al., 2021).

Self-care is a self-care deficit theory in nursing developed by Dorothea E. Orem. This theory highlights the importance of self-care and the role of nurses in helping individuals who cannot fulfill their own care needs. It consists of four related theories: self-care, dependent-care, self-care deficit, and nursing system. The self-care theory is based on the perception that humans require continuous intake to maintain health, can be trained in self-care or care for others, and may experience deficiencies that limit their ability to perform self-care (Allgood, 2018).

The application of Orem's theory can be implemented through healthy lifestyle changes, such as engaging in resistance band exercise and consuming almond chocolate. Resistance band exercise, as part of a routine, can help improve cardiovascular health (Norkhalifa, Muttaqien, & Asnawati, 2021). This intervention involves training patients to regularly perform resistance band exercises, which function to enhance endothelial health, reduce arterial contraction, and lower blood pressure and arterial stiffness (Choi, Hurr, & Kim, 2020). Resistance band

exercises are performed at home using an elastic band, which is easily accessible and does not require expensive equipment. The consumption of almond chocolate can provide significant health benefits, as almonds are rich in arginine, which can help lower blood pressure (Dikariyanto et al., 2020), and dark chocolate contains flavonoids that improve endothelial function and reduce blood pressure (Oracz & Żyżelewicz, 2020).

The use of resistance band exercise and almond chocolate consumption is one of the efforts in lifestyle modification. Resistance band exercise is a type of physical exercise that utilizes an elastic band as a tool to provide resistance during movement. The goal of this exercise is to improve muscle strength, flexibility, and cardiovascular function. The use of resistance bands has been proven effective in lowering blood pressure by engaging large muscle groups, which can enhance blood circulation and cardiovascular strength (Norkhalifa et al., 2021). The consumption of dark chocolate and almonds contributes to lowering blood pressure through the mechanism of improved vascular function, as flavonoids and arginine play a role in vasodilation effects (Maaliki et al., 2019).

Research on lifestyle modification and the application of self-care in hypertension management has been widely conducted. However, the use of self-care as a nursing theoretical approach to assess blood pressure reduction in hypertension, particularly through practical interventions that can be independently implemented, remains limited. Interventions such as resistance band exercise and almond chocolate consumption, which provide additional health benefits, have not been extensively studied. Previous studies have typically examined them separately rather than assessing their synergistic potential in lowering blood pressure. The conceptual basis for combining these interventions is in their complementary physiological mechanisms: resistance band exercise improves vascular endothelial function, while almond chocolate enhances nitric oxide synthesis through its flavonoid content, together contributing to vasodilation and improved blood pressure control. Integrating these interventions with Dorothea Orem's Self-Care Theory, which emphasizes patient empowerment and the ability to perform self-care independently, provides a strong theoretical foundation for encouraging patient adherence and active participation. A lifestyle modification approach grounded in self-care theory is expected to assist nurses in ensuring that patients adopt and maintain healthy behaviors to achieve optimal outcomes in independent hypertension management. This study aimed to evaluate the impact of Orem's Self-Care Theory on blood pressure reduction through lifestyle modifications, including resistance band exercise and almond chocolate consumption, in patients with hypertension.

2. RESEARCH METHOD

This study employed a quantitative approach using a quasi-experimental research design with a pretest–posttest control group to analyze the effectiveness of combining resistance band exercise and almond chocolate consumption in reducing blood pressure among patients with grade 1 hypertension. The study was conducted from September to November at the Martapura 1 Public Health Center, Martapura District, Banjar Regency, South Kalimantan. The study population consisted of patients attending integrated health service posts under the Martapura 1 Public Health Center, with an average of approximately 200 patient visits per month.

Sample selection was carried out using purposive sampling with a non-random approach. The sample size was calculated using hypothesis testing based on previous related studies and determined using the Lemeshow formula. A minimum of 38 respondents was required for each group, resulting in a total sample of 76 respondents, consisting of an intervention group and a control group.

Lemeshow Formula:

$$N = \frac{2\sigma^2 (Z_{1-\alpha/2} + Z_{1-\beta})^2}{(\mu_1 - \mu_2)^2}$$

The pooled standard deviation (σ) is calculated using the following formula:

$$(S_g)^2 = \frac{(S_1^2 (n_1 - 1) + S_2^2 (n_2 - 1))}{n_1 + n_2 - 2}$$

The value is then substituted into the calculation of the minimum required sample size as follows:

$$n = \frac{2 (Z_\alpha + Z_\beta) SD}{x_1 - x_2}$$

Descriptions:

S_g = Polled standard deviation

S_1 = Standard deviation of group 1 from the previous study

n_1 = Sample size of group 1 from the previous study

S_2 = Standard deviation of group 2 from the previous study

n_2 = Sample size of group 2 from the previous study

Z_α = Standard normal deviate for alpha (two-tailed hypothesis)

Z_β = Power (as determined by researcher)

σ = Pooled standard deviation

$(\mu_1 - \mu_2)$ = Minimum mean difference considered statistically significant

The research instruments included a respondent characteristic questionnaire to obtain demographic data, which were presented in frequency distributions. The Perceived Stress Scale (PSS) was used to assess stress levels, the Global Physical Activity Questionnaire (GPAQ) to evaluate physical activity levels with established reliability, and the Morisky Medication Adherence Scale (MMAS-8) to measure adherence to antihypertensive medication. A 24-hour food recall form was used to assess daily dietary intake, including calorie and sodium consumption. Observation and assessment sheets were utilized to record research data and blood pressure measurements before and after the intervention in both groups. Blood pressure was measured using a digital sphygmomanometer (Omron HEM-7124).

To control potential confounding factors, strict inclusion and exclusion criteria were applied. Inclusion criteria included respondents aged 25–59 years, diagnosed with grade 1 hypertension, having light to moderate physical activity levels based on GPAQ, and consuming amlodipine 5 mg for at least six months with low medication adherence (MMAS score <2). Exclusion criteria included patients with comorbid conditions such as heart failure, stroke, renal failure, pulmonary disease, thyroid disorders, diabetes mellitus, and musculoskeletal disorders; individuals with allergies or intolerance to almonds or chocolate; respondents with severe stress levels based on the PSS; and pregnant women. Additionally, dietary intake, physical activity levels, stress perception, and medication adherence were measured to minimize their confounding effects on blood pressure outcomes.

Ethical approval was obtained prior to data collection. This study received a research permit from the Chair of the Applied Master's Program in Nursing Health and ethical clearance from the Health Research Ethics Committee of Poltekkes Kemenkes Semarang (Approval Number: 0924/EA/KEPK/2024). All respondents provided informed consent before participating in the study.

The intervention in this study consisted of a combination of resistance band exercise and almond chocolate consumption, administered three times per week for three weeks, in addition to standard antihypertensive therapy (amlodipine 5 mg) provided by the public health center.

Resistance loop elastic band exercises with a resistance level of 2.2–6.8 kg were performed for 30 minutes per session, including a warm-up (2 minutes 30 seconds), core exercises (25 minutes), and cool-down (2 minutes 30 seconds). The exercise protocol comprised front band raises, side lateral band raises, band hammer curls, band curls, overhead triceps band extensions, upright standing rows, shoulder rotations, standing chest press, chest crossover, lateral band walk, and band squats. Adherence to the exercise intervention was ensured through direct supervision by an instructor who led each session, supported by attendance logs and direct observation by trained enumerators to ensure correct exercise performance. Almond chocolate was provided on the same day as the exercise session and consumed two hours prior to exercise in the form of a 250-ml beverage prepared from ground whole almonds, 80% dark chocolate, and 5 g of natural sweeteners. Adherence to almond chocolate consumption was monitored through direct distribution and confirmation of intake prior to exercise sessions.

During the study period, participants continued their usual antihypertensive medication and dietary patterns; these factors were not controlled but were monitored throughout the intervention. Prior to the intervention, participants with comparable medication adherence and dietary patterns were selected using the MMAS-8 and 24-hour food recall to minimize baseline variability. The control group received standard treatment with amlodipine 5 mg and participated in routine physical activities at the integrated health service post.

Data normality was assessed using the Shapiro-Wilk test (< 50 respondents). Since the data were not normally distributed, the Wilcoxon test was used. The Mann-Whitney test was applied for further analysis of group differences. The collected data were tested for normality using the Shapiro-Wilk test (< 50 respondents). Data analysis was performed using IBM SPSS Statistics version 26.

3. RESULTS AND DISCUSSION

The characteristics of hypertension patients in the Martapura 1 Community Health Center including age, gender, education level, job, duration of hypertension, occupation, age, level of physical activity, are presented in the following table.

Table 1. Characteristics of Hypertension Patients.

Variable	IG (n=38)	CG (n=38)
	N (%)	N (%)
Age (years)		
20-39	5 (13.2)	10 (26.3)
40-59	33 (86.8)	28 (73.7)
Gender		
Male	3 (7.9)	2 (5.3)
Female	35 (92.1)	36 (94.7)
Education level		
Elementary School	16 (42.1)	9 (23.7)
Junior High School	8 (21.1)	6 (15.8)
Senior High School	11 (28.9)	12 (31.6)
University	3 (7.9)	11 (28.9)
Occupation		
Unemployed	24 (63.2)	19 (50)
Private employee	14 (36.8)	10 (26.3)
Civil servant	0	9 (23.7)
Duration of illness		
≤ 5 years	21 (55.3)	19 (50)

Variable	IG (n=38)	CG (n=38)
	N (%)	N (%)
≥ 5 years	17 (44.7)	19 (50)
Physical activity		
High (≥ 3000 menit)	0	0
Physical activity		
Intermediate (≥300-3000 minute)	8 (21.1)	10 (26.3)
Low (< 600 minute)	30 (78.9)	28 (73.7)

IG = Intervention Group, CG = Control Group.

Table 1 illustrates that out of 76 hypertension patients in both groups, the majority were aged between 40-59 years (IG; n = 33, CG; n = 28). Additionally, the majority of patients were female (IG; n = 35, CG; n = 36), with an education level of elementary school (IG; n = 16) and high school (CG; n = 12), Unemployed (IG; n = 24, CG; n = 19), had hypertension for less than 5 years (IG; n = 21, CG; n = 19), and physical activity less than 600 minutes (IG; n = 30, CG; n = 28). The majority of participants in both the intervention and control groups were female. Based on observations and brief interviews, it was found that men tend to rarely access integrated health service posts services, either for treatment or routine health check-ups. Most men only seek medical attention when experiencing symptoms that interfere with bodily functions, and are generally already in a stage beyond grade 1 hypertension.

This study included participants with blood pressure levels classified as grade 1 hypertension. The distribution of systolic and diastolic blood pressure values, based on blood pressure ranges, is presented in the tables below.

Table 2. Blood Pressure Range in Hypertension Patients.

Variable	Category	N (%)	Mean±SD
Systolic blood pressure (mmHg)	140-149 mmHg	25(32.9)	154.25± 7.278
	150-160 mmHg	51(67.1)	
Diastolic blood pressure (mmHg)	70-79 mmHg	3 (3.9)	93.30 ± 7.467
	80-90 mmHg	17 (22.4)	
	90-99 mmHg	56 (73.7)	

Based on Table 2, the majority of patients (67.1%) had systolic blood pressure in the range of 150–160 mmHg, while 32.9% had systolic blood pressure between 140–149 mmHg. For diastolic blood pressure, most patients (73.7%) were in the 90–99 mmHg range, followed by 22.4% in the 80–90 mmHg range, and only 3.9% in the 70–79 mmHg range.

Table 3. Changes in Blood Pressure Before and After Intervention.

Variables	Groups	Pretest	Posttest	p
Systolic blood pressure (mmHg)	IG (n= 38)	155.32 ± 9.180	130.97 ± 13.593	0.000
	CG (n=38)	153.18 ± 4.555	151.03 ± 6.202	0.048
Diastolic blood pressure (mmHg)	IG (n= 38)	91.32 ± 9.044	95.29 ± 4.809	0.000
	CG (n=38)	84.00 ± 8.764	93.42 ± 5.740	0.048

Description: The values presented in the table represent the mean ± standard error (SE). The p-value was calculated using the Wilcoxon test to assess the significant difference between before and after the intervention. IG = Intervention Group, CG = Control Group.

Table 3 shows the results of the differences in blood pressure reduction before and after the intervention in the intervention and control groups. The intervention group obtained a p-value of 0.000, indicating a significant difference in the reduction of systolic and diastolic blood pressure after the intervention of the combination of resistance band exercise and almond chocolate consumption. Meanwhile, the control group showed a p-value of 0.048, which also indicates a difference in the reduction of systolic and diastolic blood pressure.

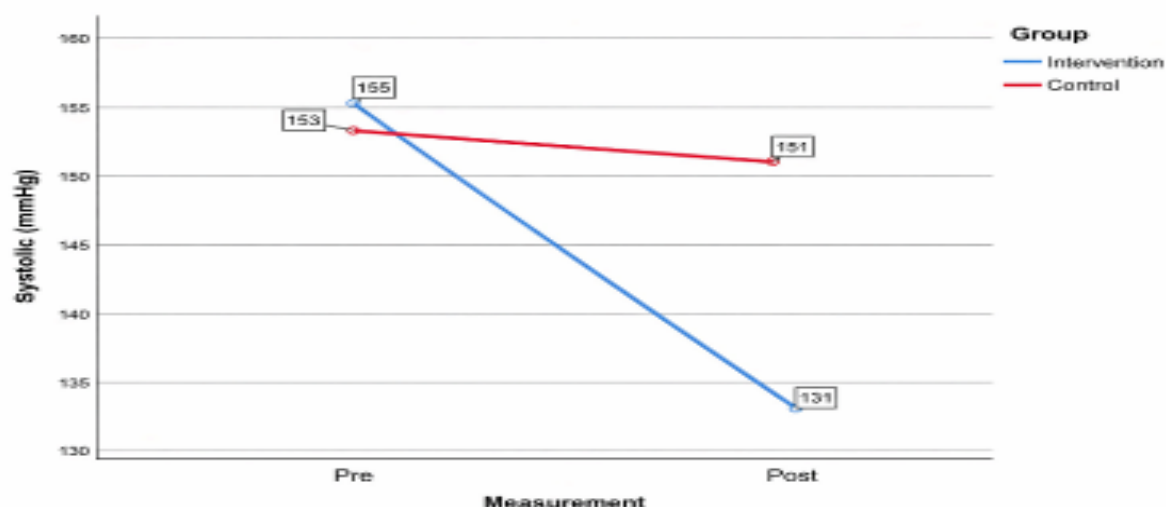


Figure 1. Changes in systolic blood pressure in the intervention group before and after the intervention.

Figure 1 illustrates changes in systolic blood pressure before and after the intervention in the intervention and control groups. In the intervention group, mean systolic blood pressure decreased substantially from 155 mmHg at baseline to 131 mmHg after the intervention. In contrast, the control group showed a smaller reduction in systolic blood pressure, declining from 153 mmHg at baseline to 151 mmHg post-intervention. These findings indicate a greater reduction in systolic blood pressure in the intervention group compared with the control group.

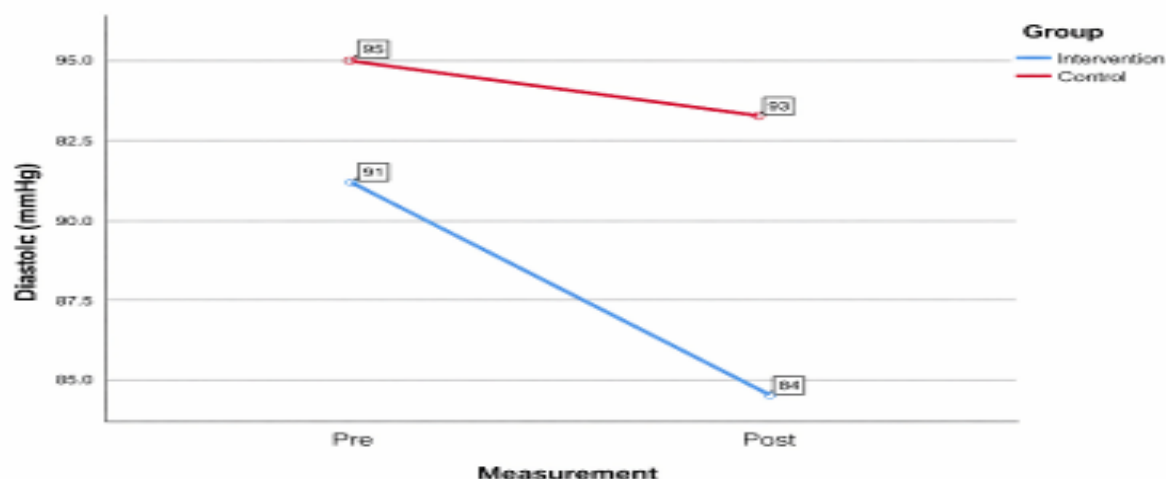


Figure 2. Changes in Diastolic Blood Pressure in the Intervention Group Before and After the Intervention.

Figure 2 illustrates changes in diastolic blood pressure before and after the intervention in the intervention and control groups. In the intervention group, mean diastolic blood pressure decreased markedly from 91 mmHg at baseline to 84 mmHg after the intervention. In contrast, the control group showed a smaller reduction in diastolic blood pressure, decreasing from 95 mmHg at baseline to 93 mmHg post-intervention. These findings indicate a greater reduction in diastolic blood pressure in the intervention group compared with the control group.

Table 4. Changes in Blood Pressure Reduction in the Intervention and Control Groups

Variables	Groups	Pretest	Posttest	Mean rank	p
Systolic blood pressure (mmHg)	IG (n= 38)	155.32 ± 9.180	130.97 ± 13.593	22.07	0.000
	CG (n=38)	153.18 ± 4.555	151.03 ± 6.202		
Diastolic blood pressure (mmHg)	IG (n= 38)	91.32 ± 9.044	95.29 ± 4.809	30.75	0.002
	CG (n=38)	84.00 ± 8.764	93.42 ± 5.740		

Description: The values displayed in the table represent the mean ± standard error (SE). The p-value was calculated using the Mann-Whitney test to assess the difference in blood pressure between the groups. IG = Intervention Group, CG = Control Group.

Based on Table 4, the systolic blood pressure in the intervention and control groups showed a p-value of 0.000, while the diastolic blood pressure showed a p-value of 0.002. These results indicate a significant difference in both systolic and diastolic blood pressure between the two groups. This suggests that the combination intervention of resistance band exercise and almond chocolate consumption has an effect on lowering blood pressure in grade 1 hypertension patients.

Table 5. Practical Meaning Difference Between the Intervention and Control Groups

Variables	Groups	Mean	SD	Cohen's Effect
Systolic blood pressure (mmHg)	IG (n= 38)	130.97	13.593	-1.89
	CG (n=38)	151.03	6.202	
Diastolic blood pressure (mmHg)	IG (n= 38)	84	8.764	-1.27
	CG (n=38)	93.42	5.74	

Description: Cohen's effect size value was calculated using the Cohen's effect size test to measure the magnitude of the effect or difference between the intervention and control groups. IG = Intervention Group, CG = Control Group.

Table 5 illustrates that the intervention has a significant impact on lowering blood pressure. The Cohen's d value of 1.89 for systolic blood pressure and 1.27 for diastolic blood pressure indicates a very large effect. Therefore, based on the effect size analysis, the combination of resistance band exercise and almond chocolate consumption is potentially effective in lowering blood pressure in patients with grade 1 hypertension.

This study demonstrated that a combination of resistance band exercise and almond chocolate consumption significantly reduced both systolic and diastolic blood pressure in patients with grade 1 hypertension. Despite most participants in both groups having low baseline physical activity levels (<600 MET-minutes/week), the intervention group experienced a substantially greater reduction in blood pressure compared with the control group. Significant within-group reductions were observed in the intervention group ($p < 0.001$), while between-group analysis revealed significant differences in systolic ($p < 0.001$) and diastolic blood pressure ($p = 0.002$). Furthermore, the effect size analysis showed very large effects for systolic (Cohen's $d = 1.89$) and diastolic blood pressure (Cohen's $d = 1.27$), indicating strong clinical significance of the intervention.

These findings are consistent with previous studies identifying physical inactivity as a major contributor to hypertension and cardiovascular risk. Individuals engaging in less than 600 MET-minutes of physical activity per week have been reported to have a significantly higher risk of hypertension-related complications (Gamage & Seneviratne, 2021; Kifle et al., 2022). In the present study, the control group maintained light intensity physical activity once weekly, resulting in physical activity levels that remained below this threshold. In contrast, the intervention group performed structured resistance band exercises three times per week, increasing physical activity levels beyond 600 MET-minutes per week.

In addition, prior research has demonstrated that resistance exercise improves endothelial function and lowers blood pressure by increasing nitric oxide (NO) bioavailability, reducing arterial stiffness, and enhancing vascular compliance (Gambardella et al., 2020). The present

study extends this evidence by showing that combining resistance exercise with functional nutritional intake, such as almond chocolate, may further enhance blood pressure reduction.

Beyond its empirical contribution, this study provides support for the application of Orem's Self-Care Theory in hypertension management through lifestyle modification. The intervention aligns with the four stages of Orem's theory: diagnostic, prescriptive, regulatory, and control operations (Alligood, 2014). Diagnostic operations involved identifying self-care deficits related to physical activity, diet, stress perception, and medication adherence using validated instruments (GPAQ, PSS, MMAS-8, and 24-hour food recall). Prescriptive operations focused on planning resistance band exercise and almond chocolate consumption. Regulatory operations included education, supervision, and motivation, while control operations involved continuous monitoring of blood pressure, stress levels, dietary intake, and adherence throughout the intervention period.

These findings are in line with previous research showing that self-care-based interventions enhance patients' ability to manage chronic conditions and improve health outcomes, reinforcing the relevance of nursing theory in community-based hypertension care (Sultan & Khanum, 2024).

Building on these theoretical foundations, the findings of this study have important implications for nursing practice, particularly in supporting self-care among patients with grade 1 hypertension. Respondents were provided with educational supportive care focusing on the benefits of resistance band exercises and almond chocolate consumption for cardiovascular health, along with guidance on implementing these interventions independently. This approach empowered patients to take responsibility for their own self-care and encouraged the adoption of sustainable healthy lifestyle behaviors.

Nurses play a crucial role in ensuring that patients not only initiate but also maintain lifestyle modifications to achieve optimal blood pressure control. In contemporary hypertension management, the nursing role extends beyond clinical monitoring to include detection, referral, and follow-up; diagnostic and medication management; patient education, counseling, and skill development; care coordination; community health management; and quality improvement initiatives (Dennison Himmelfarb et al., 2023).

To effectively fulfill these roles, nurses can adopt a patient-centered care (PCC) approach that emphasizes respect for patients preferences, values, and active involvement in decision-making (Kuipers, Cramm, & Nieboer, 2019). Integrating PCC with Orem's self-care theory is particularly relevant, as both frameworks prioritize individualized assessment and patients' capacity for self-care. Through this combined approach, nursing interventions can be tailored to patients' levels of independence, thereby enhancing adherence to lifestyle modifications and improving long-term hypertension management outcomes.

Despite these promising findings, several limitations and potential confounding factors should be considered when interpreting the results. Stress levels were assessed using the Perceived Stress Scale, and participants with severe stress were excluded to minimize its influence on blood pressure outcomes. Dietary intake, including calorie and sodium consumption, was monitored using a 24-hour food recall, while medication adherence was assessed using the MMAS-8. Although these confounding factors were not strictly controlled during the intervention period, baseline comparability was ensured through the application of strict inclusion criteria and continuous monitoring.

Socioeconomic status may also have influenced physical activity behavior, as most participants had low educational attainment and were unemployed. Low socioeconomic status has been associated with increased cardiovascular risk through biological, psychosocial, and behavioral mechanisms (Abror Jeem, 2022). These factors should be taken into account when generalizing the study findings.

Future studies should explore the long-term adherence and sustainability of self-care–based interventions combining physical activity and functional nutrition in patients with hypertension. Longer follow-up periods are needed to determine whether blood pressure reductions can be maintained over time. Additionally, future research should consider more rigorous control of dietary intake, stress management, and medication adherence, as well as the inclusion of broader socioeconomic and psychosocial variables to better understand their influence on hypertension outcomes.

4. CONCLUSION

This study concludes that a lifestyle modification intervention grounded in Orem’s Self-Care Theory incorporating resistance band exercise and almond chocolate consumption is associated with significant reductions in systolic and diastolic blood pressure among patients with grade 1 hypertension. The intervention demonstrated strong clinical relevance, supported by statistically significant between-group differences and large effect sizes.

The findings suggest that the structured application of Orem’s self-care framework, encompassing diagnostic, prescriptive, regulatory, and control operations, may enhance patients’ adherence to healthy lifestyle behaviors and support more effective self-management of hypertension. Furthermore, integrating Orem’s theory with a patient centered care approach can strengthen the role of nurses in empowering patients and optimizing hypertension management in community and primary healthcare settings.

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