Walking is Worthy: Walking for Hypertension

Ashleigh Y. Peterson BSN, RN, DNP Student

College of Nursing and Health Professions, Valparaiso University

VALPARAISO UNIVERSITY

Significance of the Problem

- Hypertension (HTN) is associated with increased risk of stroke, angina, myocardial infarction, heart failure, peripheral artery disease, end-stage renal disease, and abdominal aortic aneurysms (Whelton et al., 2018).
- HTN is a major risk factor for developing cardiovascular disease, which is the United States' leading cause of death in men and women (USPSTF, 2020).
- Worldwide, it is estimated that 1.3 billion people have HTN, and it is responsible for 9 million deaths (Lee et al., 2021).
- Around 46% of Americans have HTN (Dempsey et al., 2018).

PICOT Question

Does an eight-week (T) structured walking program utilizing a smartwatch for step counts and education (I) reduce blood pressure and increase the number of minutes of weekly moderate intensity walking (O) in adults aged 18 years or older with essential HTN (P) compared to baseline (C)?

Review of Literature

Evidence	Database/Source	LOE/Quality
Barnason et al. (2017)	TRIP	I/High[a]
Barone Gibbs et al. (2021)	TRIP	I/High[b]
Baross et al. (2017)	CC	II/High[a]
Chiang et al. (2019)	CC	II/High[a]
Dempsey et al. (2018)	PubMed	I/Moderate[a]
Gradidge & Golele (2018)	CC	II/Moderate[a]
Lee & Chae (2020)	CINAHL	I/High[a]
Lee et al. (2021)	Cochrane	I/High[a]
Perl et al. (2016)	Medline	II/High[a]
Whelton et al. (2018)	TRIP	I/High[b]

[a] CASP; [b] AGREE II; CC = citation chased

Best Practices

Physical Activity	➤ Structured moderate-intensity walking program reduced systolic blood pressure (SBP) and diastolic blood pressure (DBP) (Baross et al., 2017; Dempsey et al., 2018; Gradidge & Golele, 2018; Lee & Chae, 2020; Lee et al., 2021; Whelton et al., 2018). ➤ American Heart Association and American College of Cardiology recommend 90-150 minutes of moderate-intensity aerobic physical activity (PA) per week for cardiovascular health (Barone Gibbs et al., 2021; Whelton et al., 2018). ➤ Walking at moderate-intensity for 90-150 minutes per week for eight to 11 weeks showed the greatest reduction in systolic BP and diastolic BP (Lee & Chae, 2020).
Pedometer	➤ Using a pedometer helps people with HTN monitor their step count and their trends in PA over time. (Barone Gibbs et al., 2021) ➤ Pairing a structured walking program and a daily step count goal reduced SBP and DBP (Chiang et al., 2019; Lee et al., 2021).
Education	➤ Should include pathophysiology and consequences of HTN, self-monitoring of BP at home, and importance of PA. (Barnason et al., 2017; Perl et al., 2016; Whelton et al., 2018) ➤ Follow-up visits and education reinforce adherence and increase accountability (Barnason et al., 2017; Perl et al., 2016; Whelton et al., 2018).

Implementation

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Setting	Large family practice office in Northwest Indiana

Intervention	Eight-week moderate-intensity walking program
	     Weeks 1-2: ≥ 90 minutes weekly
	     Weeks 3-4: ≥ 120 minutes weekly
	     Weeks 5-8: ≥ 150 minutes weekly
	 Track daily step counts
	 Baseline and week four education on HTN
	 Follow-up visit at four and eight weeks

Participants	**Sample**: 13 with essential HTN completed intervention **Age**: 31-66 years **Gender**: 4 female/9 male **Number taking BP meds at baseline**: 10

Data type	Baseline for participants who completed intervention (n=13)	Week eight for participants who completed intervention (n=13)
Mean SBP (mmHg) **Range**	137.15, SD = 15.53 112-166	125.08, SD = 9.61 110-144
Mean DBP (mmHg) **Range**	81.77, SD = 12.04 62-106	75.08, SD = 7.64 62-88
Mean # of Weekly Minutes of MIW **Range**	53.07, SD = 88.33 0-315	195.85, SD = 168.09 0-590
Participants With BP Medication Change During Intervention	3 (23.08%)	

Evaluation

Primary Outcomes

SBP & DBP

Mean SBP and DBP at Baseline and Week Eight
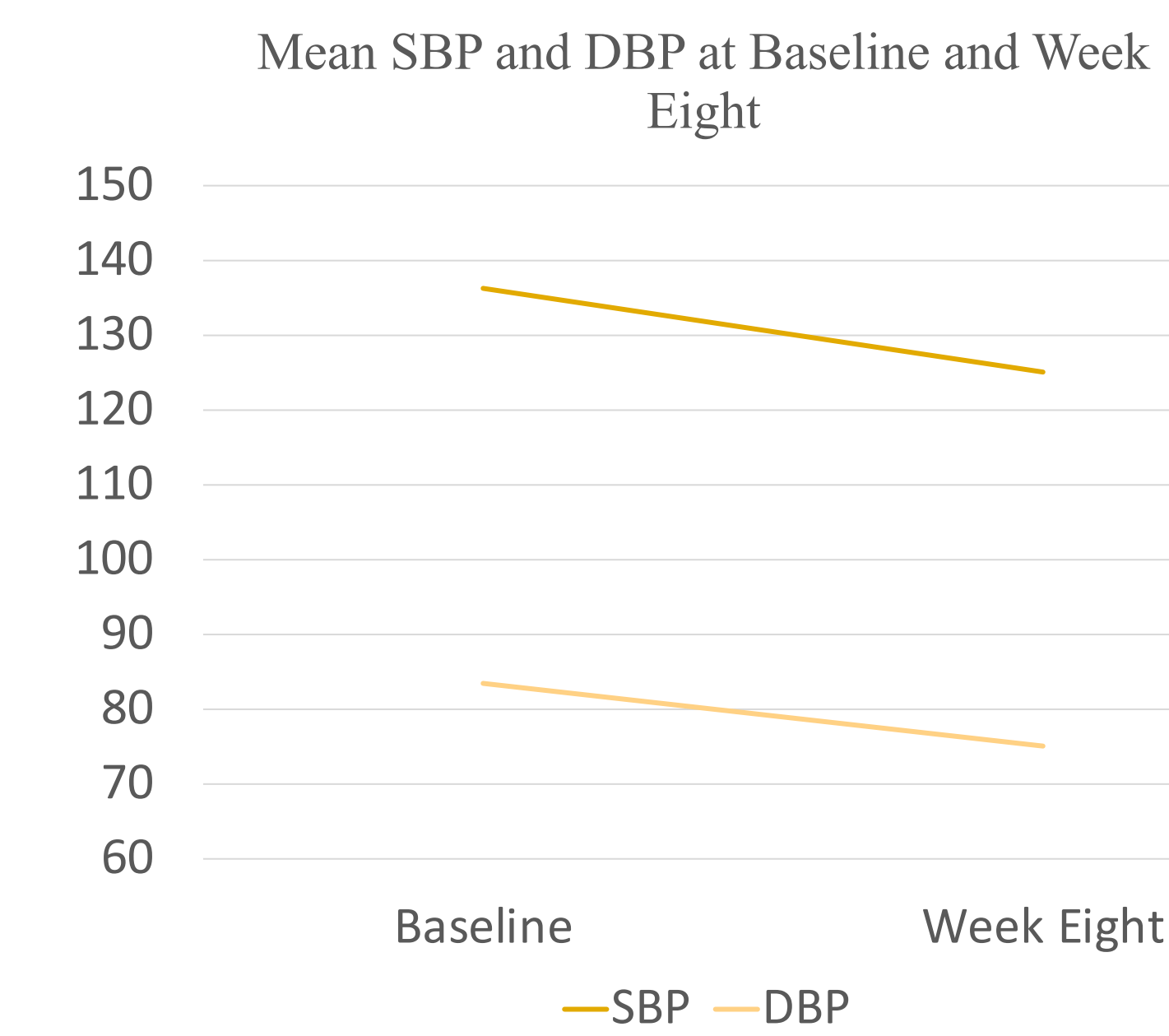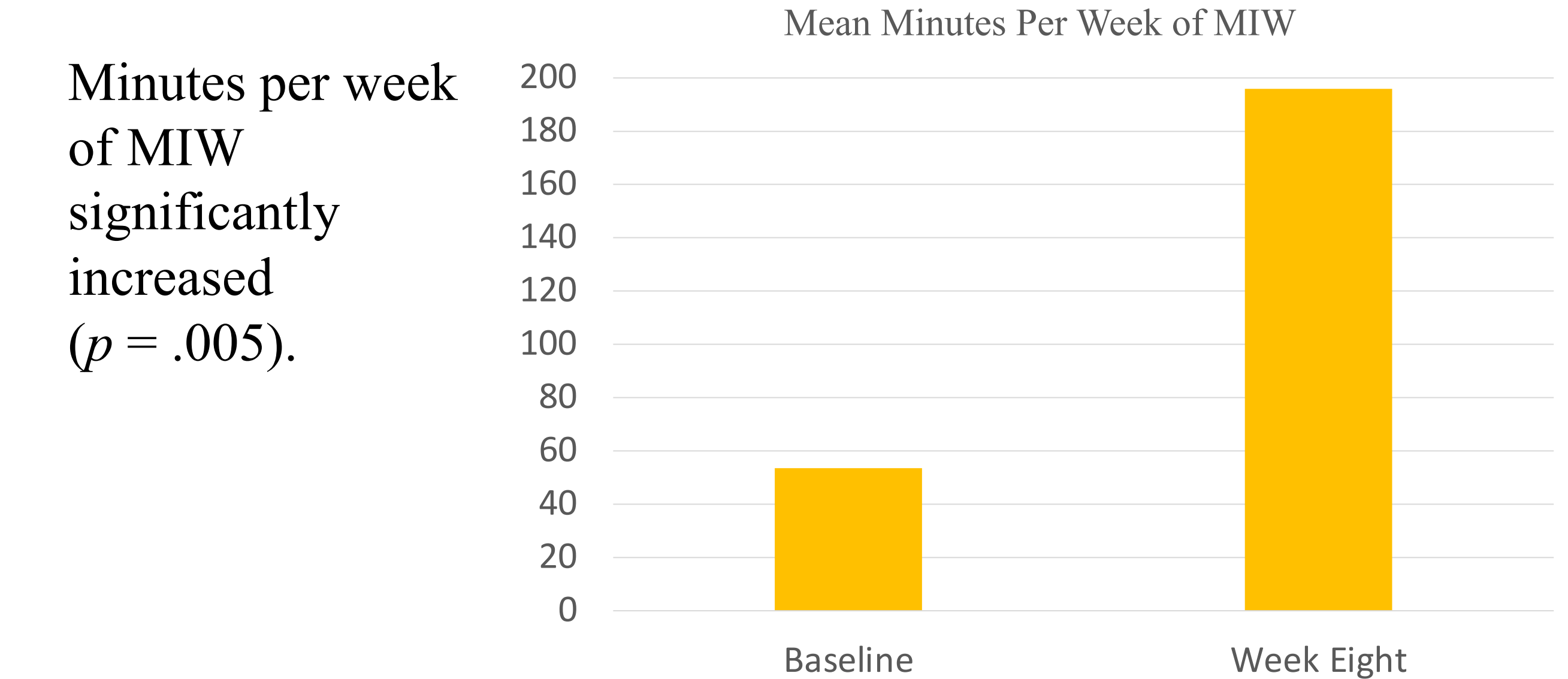
Significant reductions in SBP (p = 0.007)* and DBP (p = .021)*.

*When data for three participants was removed due to BP medication change during the intervention, these reductions were still significant (SBP: p = .036; DBP: p = .025).

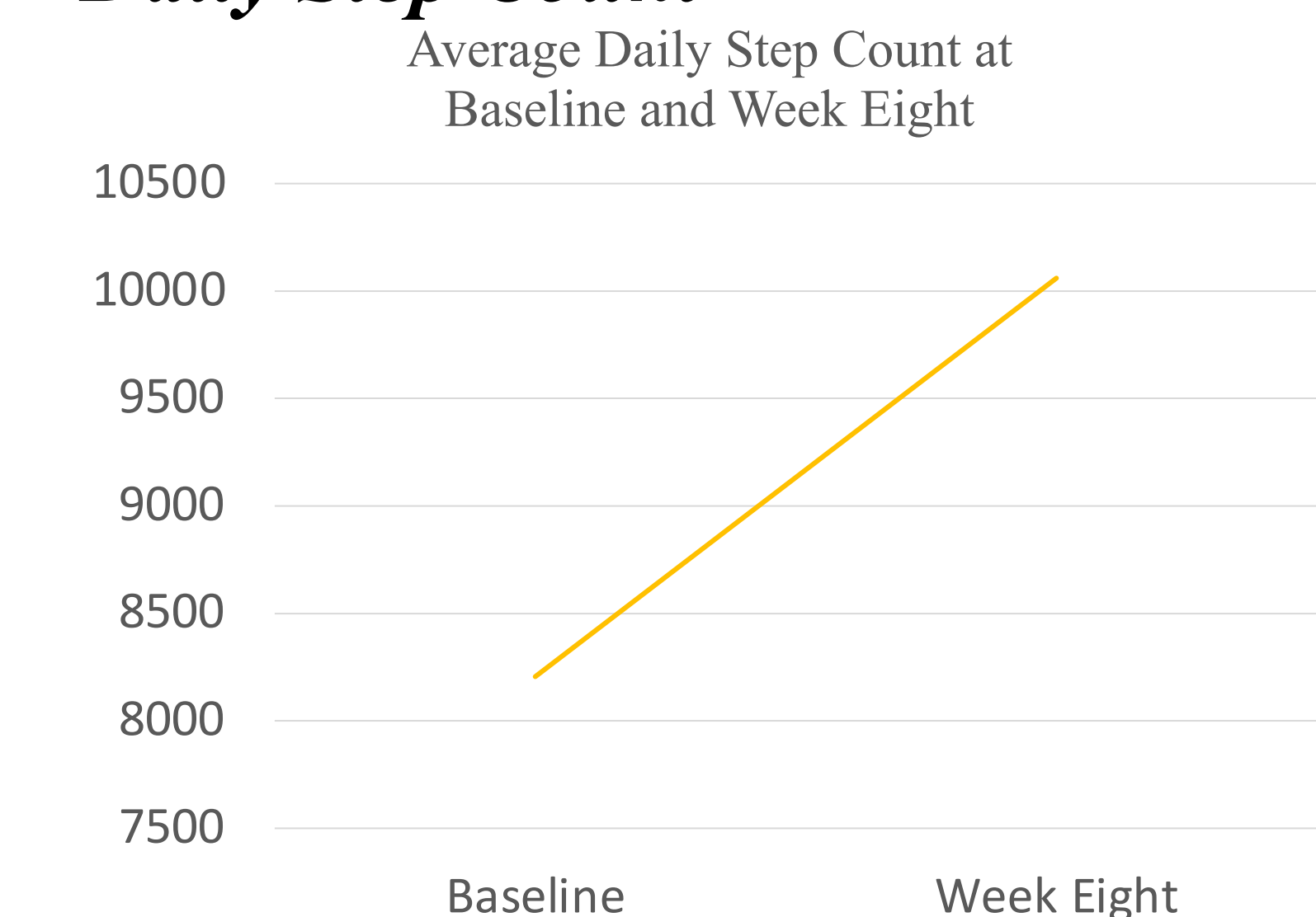**Minutes Per Week of Moderate-intensity Walking**

Mean Minutes Per Week of MIW

Minutes per week of MIW significantly increased (p = .005).

Wilcoxon Signed-Rank Sum test was used for primary outcome analysis because data did not meet all four assumptions for parametric testing.

Secondary Outcomes

Daily Step Count

Average Daily Step Count at Baseline and Week Eight

Average daily step counts increased by 1,854 steps per day from baseline to week eight.

Descriptive analysis was completed on secondary outcome due to small sample providing complete data (n = 5).

Conclusion & Recommendations

Eight-week moderate-intensity walking program helps people with HTN reduce their SBP and DBP.

Recommendations for Practice:
- Accountability is helpful for adherence (follow-up/log sheet for patient).
- Focus less on daily step counts.

Implications for Future Research:
- Motivation and behavior change for people with HTN to engage in healthier behaviors.