PHYSICAL ACTIVITY AND BLOOD PRESSURE AMONG ADULTS WITH HYPERTENSION AT KERUAK PRIMARY HEALTH CARE CENTER

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Abstract

Hypertension remains a major cardiovascular risk, and regular physical activity is widely recommended as part of non-pharmacological management. This study examined the association between physical activity level and blood pressure category among adults with hypertension at Keruak Primary Health Care Center, Indonesia. An analytical cross-sectional design was used with 97 respondents. Physical activity was classified as low, moderate, or high, while blood pressure was grouped into grades I, II, and III. Descriptive statistics summarized respondent characteristics, physical activity, and blood pressure. Spearman rank correlation tested the association between both ordinal variables. Most respondents were women (87.6%), aged 18-59 years (63.9%), educated to primary-school level (52.6%), and employed as laborers (38.1%). Low physical activity predominated (58.8%), followed by moderate (32.0%) and high activity (9.3%). Most respondents had grade I hypertension (83.5%); grades II and III each accounted for 8.2%. Physical activity and blood pressure were not significantly correlated ($r=0.028$; $p=0.789$; $n=97$). The correlation was positive but negligible. In this sample, physical activity level alone did not explain variation in blood pressure category. Hypertension care should therefore retain physical-activity counseling while simultaneously assessing medication adherence, dietary sodium, body composition, stress, sleep, comorbidities, and measurement quality. Longitudinal studies using objective activity measures and repeated blood-pressure assessment are recommended.

Keywords: Blood Pressure, Hypertension, Physical Activity

1. INTRODUCTION

Hypertension is one of the most important modifiable causes of cardiovascular disease, stroke, chronic kidney disease, and premature mortality. Its burden is especially pronounced in low- and middle-income countries, where detection, treatment, and control remain uneven [1,2]. Because hypertension is often asymptomatic, primary health care has a central role in screening, sustained treatment, counseling, and monitoring.

Physical inactivity is a recognized behavioral risk factor for cardiovascular disease and hypertension. The World Health Organization recommends that adults undertake 150-300 minutes of moderate-intensity aerobic activity or 75-150 minutes of vigorous-intensity activity per week, alongside muscle-strengthening activities [3,4]. Regular movement can influence vascular resistance, autonomic balance, endothelial function, body weight, insulin sensitivity, and inflammatory pathways. Exercise-based interventions, including walking, have generally demonstrated modest reductions in systolic and diastolic blood pressure, although effects vary across populations and intervention characteristics [5,6].

The relationship observed in routine clinical populations may be less direct than that reported in controlled interventions. Blood pressure at a single visit reflects multiple interacting determinants,

including age, medication use and adherence, sodium intake, obesity, smoking, sleep, psychosocial stress, comorbidity, time of measurement, and device or observer variation. Self-reported activity categories may also fail to capture intensity, duration, domain, and recent changes in behavior. Consequently, local evidence is needed to determine whether activity level differentiates blood pressure severity among patients already living with hypertension.

This study aimed to analyze the association between physical activity level and blood pressure category among 97 adults with hypertension receiving care at Keruak Primary Health Care Center. The findings were expected to inform contextualized nursing assessment and lifestyle counseling in primary care.

2. METHODOLOGY

2.1 Study design and setting

This analytical observational study uses a cross-sectional design. Data were collected at UPTD Puskesmas Keruak, East Lombok, West Nusa Tenggara, Indonesia, over 2 months. This design assesses physical activity and blood pressure during the same study period and therefore supports associations, not cause-and-effect.

2.2 Population and sample

The target population comprised adults diagnosed with hypertension who accessed services at the study site. A total of 97 respondents were included using non-probability sampling using purposive sampling method. Inclusion criteria were Inclusion Criteria: Willing to be a respondent, cooperative in the research process, and not having any mental disabilities, exclusion criteria: patients with severe complications, experiencing a decrease in consciousness.

2.3 Variables and measurements

Instrument used for the independent variable in this study is physical activity, while the dependent variable is the blood pressure of hypertension patients. Physical activity is measured using the Baecke Physical Activity Questionnaire (BPAQ), which categorizes physical activity into low, moderate, and high levels. Blood pressure category was the dependent variable and was classified as grade I, grade II, or grade III.

2.4 Data analysis

Frequencies and percentages described respondent characteristics, physical activity, and blood pressure category. The association between physical activity and blood pressure was examined using Spearman rank correlation because both variables were ordinal. Statistical significance was set at $p<0.05$. The analysis included all 97 respondents.

3. RESULTS

3.1 Respondent characteristics

Table 1. Distribution of respondent characteristics (n=97)

Characteristic	Category	n	%
Sex	Male	12	12.4
	Female	85	87.6
Age	18-59 years	62	63.9
	>=60 years	35	36.1
Education	No formal education	21	21.6
	Primary school	51	52.6
	Junior high school	17	17.5
	Senior high/vocational school	6	6.2
	Higher education	2	2.1
Occupation	Farmer	7	7.2
	Fisher	14	14.4
	Laborer	37	38.1
	Trader	21	21.6
	Civil servant	16	16.5
	Homemaker	2	2.1

Most respondents were women (87.6%) and aged 18-59 years (63.9%). More than half had completed primary school (52.6%), while only 2.1% had higher education. Laborers represented the largest occupational group (38.1%).

3.2 Physical activity level

Table 2. Distribution of physical activity levels (n=97)

Physical activity	n	%
Low	57	58.8
Moderate	31	32.0
High	9	9.3
Total	97	100.0

Low physical activity was the dominant category (58.8%). Only nine respondents (9.3%) were classified as having high physical activity, indicating that limited activity was common among hypertensive patients at the study site.

3.3 Blood pressure category

Table 3. Distribution of blood pressure categories (n=97)

Blood pressure category	n	%
Grade I hypertension	81	83.5
Grade II hypertension	8	8.2
Grade III hypertension	8	8.2
Total	97	100.0

Grade I hypertension accounted for 83.5% of respondents. Grade II and grade III hypertension were each observed in eight respondents (8.2%).

3.4 Association between physical activity and blood pressure

Table 4. Spearman rank correlation between physical activity and blood pressure (n=97)

Variables	Spearman r	p-value	Interpretation
Physical activity and blood pressure	0.028	0.789	Not significant

Spearman analysis showed a negligible positive correlation between physical activity and blood pressure category (r=0.028). The association was not statistically significant (p=0.789), indicating that the ordinal activity category did not meaningfully covary with hypertension grade in this sample.

4. DISCUSSION

The principal finding was the absence of a statistically significant association between physical activity level and blood pressure category. The correlation coefficient was close to zero, suggesting that respondents with higher activity categories were not consistently distributed across lower or higher hypertension grades. This result should not be interpreted as evidence that physical activity is clinically unimportant. Rather, it shows that the activity measure used in this cross-sectional sample did not explain concurrent blood-pressure severity.

The finding differs from intervention evidence showing that structured aerobic exercise and walking can reduce blood pressure [5,6]. This apparent difference is methodologically plausible. Intervention studies estimate change after a prescribed dose of activity, whereas the present study compared naturally occurring activity categories and a concurrent blood-pressure classification. A person with more severe hypertension may have recently increased activity following clinical advice, while medication and dietary changes may independently lower pressure. Such reverse causation and co-intervention cannot be separated in a cross-sectional design.

Measurement is another likely explanation. Broad categories of low, moderate, and high activity compress information about frequency, duration, intensity, occupational activity, transport, household work, and sedentary time. Self-report can introduce recall and social-desirability bias. Blood pressure also varies within individuals and is affected by recent exertion, caffeine, tobacco, stress, pain, bladder fullness, posture, cuff size, rest period, and medication timing. Current hypertension guidelines emphasize standardized and repeated measurement, and recommend out-of-office confirmation when feasible [7,8]. Misclassification in either variable would weaken an observable correlation.

The sample profile is relevant to nursing practice. Most respondents were women, had primary-school education, and reported low physical activity. Education should therefore use plain language, demonstrations, goal setting, and teach-back. Advice should be individualized to clinical status, functional ability, occupational workload, cultural context, and personal preference. Walking,

progressive aerobic activity, muscle strengthening, and reduction of sedentary time can remain part of care because these behaviors provide broad cardiovascular and functional benefits even when a cross-sectional correlation with hypertension grade is absent [3-6].

Blood-pressure control is multifactorial. Future analyses should model age, sex, body mass index or waist circumference, dietary sodium, antihypertensive medication class and adherence, smoking, alcohol use, diabetes, kidney disease, sleep, and stress. A longitudinal design with repeated standardized blood-pressure measurements and an objective activity monitor would clarify temporal and dose-response relationships. Reporting continuous systolic and diastolic values, rather than only grades, would also preserve statistical information and improve sensitivity.

4.1 Strengths and limitations

This study provides local evidence from a primary-care population and includes the full reported sample of 97 respondents. Its limitations include the cross-sectional design, the use of ordinal categories, the absence of adjusted analysis in the supplied results, and likely residual confounding. Details of sampling, activity measurement, blood-pressure protocol, medication exposure, and comorbidities must be reported to permit appraisal and replication. Generalization should be limited to populations with similar characteristics and care contexts.

5. CONCLUSIONS

Among 97 adults with hypertension at Keruak Primary Health Care Center, low physical activity was common and grade I hypertension predominated. Physical activity level was not significantly associated with blood pressure category (Spearman r=0.028; p=0.789). Primary-care nurses should continue evidence-based physical-activity counseling as one component of comprehensive hypertension management, while assessing medication adherence, diet, body composition, sleep, stress, and comorbidities. Longitudinal research using validated or objective activity measures, repeated standardized blood-pressure readings, and multivariable analysis is warranted.

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