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Medication compliance and blood pressure among Prolanis patients with hypertension

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Abstract

Background: Hypertension is a major cause of premature morbidity and mortality. Long-term medication adherence is an important component of blood-pressure management, although blood pressure is also influenced by clinical and behavioural factors beyond medication taking.
Purpose: To examine the association between medication compliance and systolic and diastolic blood pressure among Prolanis patients with hypertension.
Method: This cross-sectional study included 113 Prolanis patients with hypertension at Puskesmas Pandanaran, Semarang. Medication compliance was assessed using the 8-item Morisky Medication Adherence Scale (MMAS-8), and blood pressure was measured using a sphygmomanometer. Unadjusted associations were analysed using Spearman's rank correlation in SPSS version 27.
Results: High medication compliance was reported by 85 respondents (75.2%), moderate compliance by 11 (9.7%), and low compliance by 17 (15.0%). Median systolic blood pressure was 137 mmHg (range 94–177) and median diastolic pressure was 80 mmHg (59–105). Medication compliance was weakly and negatively associated with systolic blood pressure ($\rho = -0.248$; $p = 0.008$) and diastolic blood pressure ($\rho = -0.196$; $p = 0.038$).
Conclusion: Higher medication compliance was associated with lower systolic and diastolic blood pressure, although both correlations were weak. The cross-sectional design does not establish causality, and blood-pressure control is likely influenced by multiple additional factors.

Keywords: Blood Pressure; Hypertension; Medication Compliance; Medication Adherence; Prolanis.

INTRODUCTION

Hypertension is a major global health problem. The World Health Organization estimates that 1.28 billion adults aged 30–79 years have hypertension, fewer than half are diagnosed and treated, and only about one in five achieve blood-pressure control (World Health Organization, 2023). Long-term epidemiological data confirm that improving the diagnosis, treatment, and control of hypertension is a global priority (NCD Risk Factor Collaboration [NCD-RisC], 2021). In Indonesia, the 2023 Indonesian Health Survey reported a measured prevalence of hypertension of 30.8% among adults aged 18 years or older (Health Development Policy Agency, 2024).

Hypertension may remain asymptomatic despite increasing cardiovascular and renal risk. Elevated blood pressure also requires attention in younger adults, for whom diagnosis and treatment may be delayed (Hinton et al., 2020). The study applied the conventional threshold of systolic blood pressure ≥140 mmHg and/or diastolic pressure ≥90 mmHg, consistent with the Indonesian guidance used in its original protocol (Ministry of Health of the Republic of Indonesia, 2021). Contemporary international recommendations emphasize individualized treatment, regular follow-up, and standardized blood-pressure assessment (Unger et al., 2020; World Health Organization, 2021).

Medication adherence is an important component of long-term blood-pressure management. Poor adherence is common across hypertension populations (Abegaz et al., 2017), and hypertension-specific studies using the eight-item Morisky Medication Adherence Scale (MMAS-8) have associated higher adherence with more favourable blood-pressure outcomes (Morisky et al., 2008; Krousel-Wood et al., 2009; Oliveira-Filho et al., 2012;

Gulayin et al., 2023). However, adherence is only one factor influencing measured blood pressure (Burnier & Egan, 2019).

Prolanis is an Indonesian chronic-disease management program that integrates regular monitoring, treatment, education, and patient participation, including for hypertension (Ministry of Health of the Republic of Indonesia, 2022; Meiriana et al., 2019). As adherence encompasses medication initiation, implementation, and persistence, different adherence measures may capture distinct aspects of patient behavior (Vrijens et al., 2012). This study examined the association between medication compliance and blood pressure among Prolanis patients with hypertension at Puskesmas Pandanaran, Semarang.

RESEARCH METHOD

This quantitative analytic study employed a cross-sectional design at Puskesmas Pandanaran in Semarang, Indonesia. The target population comprised 289 patients with hypertension, including 118 patients in the accessible Prolanis population. A total of 113 patients (95.8% of the accessible population) were included in the analysis. Recruitment used a non-probability approach; the source documentation did not consistently identify its subtype as purposive or convenience sampling.

Inclusion criteria were age 18 years or older, a diagnosis of hypertension, participation in Prolanis at Puskesmas Pandanaran, and written consent to complete the study. Respondents who were uncooperative, did not complete the study, or had hypertension complications causing activity intolerance, such as severe stroke, were excluded.

Medication adherence was assessed using the eight-item Morisky Medication Adherence Scale (MMAS-8). Reported adherence scores were classified as low (<6), moderate (6 to <8), or high (=8), consistent with published hypertension studies (Morisky et al., 2008; Krousel-Wood et al., 2009). The original study records did not include item-level responses or a local scoring protocol for independent verification.

Systolic and diastolic blood pressure were measured using a sphygmomanometer and expressed in mmHg. Measurements were analyzed as reported in the study records. Details about device type, cuff selection, patient preparation, resting period, positioning, and repeated measurements were not available in the source documentation.

Categorical variables were summarised as frequencies and percentages, and blood-pressure values as medians and ranges. Spearman's rank correlation assessed the unadjusted associations of medication-adherence category with systolic and diastolic blood pressure; $p < 0.05$ was considered statistically significant. Analyses were performed using SPSS version 27. Ethics clearance was recorded as No. 1771/A.1-KEPK/FIK-SA/X/2025, dated 24 October 2025, from the Health Research Ethics Committee, Faculty of Nursing, Universitas Islam Sultan Agung, Semarang.

RESEARCH RESULTS

Table 1. Medication adherence among Prolanis patients (N = 113)

Medication adherence (MMAS-8)	n/%
Low (<6)	17/15.0
Moderate (6 to <8)	11/9.7
High (=8)	85/75.2
Total	113/100.0

Table 1 shows Most respondents had high medication compliance (85, 75.2%), whereas 17 (15.0%) had low and 11 (9.7%) had moderate compliance.

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Table 2. Blood pressure distribution (N = 113)

Variable	Median	Range
Systolic blood pressure, mmHg	137	94–177
Diastolic blood pressure, mmHg	80	59–105

Table 2 shows that the median systolic blood pressure was 137 mmHg and the median diastolic blood pressure was 80 mmHg. These separate summaries cannot determine how many participants met an individual-level blood pressure-control criterion.

Table 3. Medication adherence and blood pressure (N = 113)

Compliance level / statistic	Systolic, mmHg	Diastolic, mmHg
Low, median (range)	146 (128–177)	85 (70–99)
Moderate, median (range)	145 (94–159)	77 (67–98)
High, median (range)	136 (103–176)	79 (59–105)
Spearman ρ	-0.248	-0.196
p value	0.008	0.038

Table 3 shows that medication adherence was weakly and inversely associated with both systolic blood pressure (Spearman ρ = −0.248; p = 0.008) and diastolic blood pressure (ρ = −0.196; p = 0.038). Both analyses were unadjusted.

DISCUSSION

Higher medication compliance was associated with lower systolic and diastolic blood pressure. This finding agrees in direction with evidence that medication adherence contributes to better hypertension management (Morisky et al., 2008; Burnier & Egan, 2019; Gulayin et al., 2023). Similar Indonesian reports have described medication-adherence patterns in relation to blood-pressure management (Larasati & Husna, 2020; Nurdin et al., 2023; Wirakhmi & Purnawan, 2021). Nevertheless, both correlations were weak, indicating limited association strength and underscoring the influence of other determinants.

The systolic pattern was directionally consistent across categories: the median declined from 146 mmHg in the low-compliance group to 145 mmHg in the moderate group and 136 mmHg in the high-compliance group. This pattern supports the interpretation of the negative systolic correlation as higher compliance accompanying lower systolic blood pressure.

The diastolic pattern was not strictly monotonic. Median diastolic pressure was 85 mmHg in the low-adherence group, 77 mmHg in the moderate group, and 79 mmHg in the high group. With only 11 patients in the moderate-adherence group, the category median should not be interpreted as evidence of benefit relative to high adherence. The negative correlation reflects a weak overall association between ranked adherence and pressure, not a consistent ordered decline across all categories.

Adherence is only one contributor to blood-pressure outcomes, alongside age, comorbidities, pharmacological regimens, treatment adjustments, lifestyle, and measurement conditions (Beevers et al., 2001; Unger et al., 2020; World Health Organization, 2021). Furthermore, cross-sectional association cannot establish which variable preceded the other or whether changing adherence would cause a corresponding change in measured pressure.

The MMAS-8 is a self-report instrument and may be affected by recall and social desirability biases (Morisky et al., 2008; Krousel-Wood et al., 2009). Broader reviews of antihypertensive adherence highlight multiple causes of missed treatment, including regimen complexity and patient- and system-level factors (Abegaz et al., 2017; Burnier & Egan, 2019). These considerations support assessing adherence in the context of clinical care rather than

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treating the MMAS-8 category as a stand-alone measure of blood pressure control.

LIMITATIONS

The cross-sectional design and non-probability sampling limit causal inference and generalizability. The exclusion of five patients and sample-size justification were unclear. MMAS-8 scoring, instrument-use permission, and blood-pressure measurement procedures were incompletely documented. Baseline characteristics were unavailable, and small adherence subgroups with no adjustment for potential confounders limit the interpretation of the findings.

CONCLUSION

Among 113 Prolanis patients with hypertension, higher reported medication adherence was weakly associated with lower systolic ($\rho = -0.248$; $p = 0.008$) and diastolic ($\rho = -0.196$; $p = 0.038$) blood pressure. These unadjusted cross-sectional associations do not establish that adherence alone determines blood-pressure control.

SUGGESTION

Puskesmas staff should continue to identify patients who report difficulty taking antihypertensive medicines and provide individualized counseling, follow-up, and support. Future studies should define recruitment and exclusion procedures clearly, document authorized adherence-instrument administration and scoring, use standardized repeated blood-pressure measurements, and adjust analyses for treatment regimens, comorbidities, and lifestyle factors.

REFERENCES

Abegaz, T. M., Shehab, A., Gebreyohannes, E. A., Bhagavathula, A. S., & Elnour, A. A. (2017). Nonadherence to antihypertensive drugs: A systematic review and meta-analysis. Medicine, 96(4), e5641. https://doi.org/10.1097/MD.0000000000005641

Beevers, G., Lip, G. Y. H., & O'Brien, E. (2001). ABC of hypertension: Blood pressure measurement. Part I—Sphygmomanometry: Factors common to all techniques. BMJ, 322(7292), 981–985. https://doi.org/10.1136/bmj.322.7292.981

Burnier, M., & Egan, B. M. (2019). Adherence in hypertension. Circulation Research, 124(7), 1124–1140. https://doi.org/10.1161/CIRCRESAHA.118.313220

Gulayin, P. E., Beratarrechea, A., Poggio, R., Gibbons, L., Nejamis, A., Santero, M., Rubinstein, A., & Irazola, V. (2023). Blood pressure association with the 8-item Morisky Medication Adherence Scale in hypertensive adults from low-resource primary care settings: Results from a prospective cohort nested within a randomised controlled trial. High Blood Pressure & Cardiovascular Prevention, 30(3), 281–288. https://doi.org/10.1007/s40292-023-00580-7

Health Development Policy Agency. (2024). Laporan tematik Survei Kesehatan Indonesia tahun 2023: Potret kesehatan Indonesia [Thematic report of the 2023 Indonesian Health Survey]. Ministry of Health of the Republic of Indonesia. https://repository.badankebijakan.kemkes.go.id/id/eprint/5537/

Hinton, T. C., Adams, Z. H., Baker, R. P., Hope, K. A., Paton, J. F. R., Hart, E. C., & Nightingale, A. K. (2020). Investigation and treatment of high blood pressure in young people: Too much medicine or appropriate risk reduction? Hypertension, 75(1), 16–22. https://doi.org/10.1161/HYPERTENSIONAHA.119.13820

Krousel-Wood, M., Islam, T., Webber, L. S., Re, R. N., Morisky, D. E., & Muntner, P. (2009). New medication adherence scale versus pharmacy fill rates in seniors with hypertension. American Journal of Managed Care, 15(1), 59–66.

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Larasati, N., & Husna, N. (2020). Pengaruh Prolanis dan kepatuhan minum obat terhadap tekanan darah pasien hipertensi di Puskesmas Gamping 1. Media Ilmu Kesehatan, 8(2), 87–93. https://doi.org/10.30989/mik.v8i2.293

Meiriana, A., Trisnantoro, L., & Padmawati, R. S. (2019). Implementasi Program Pengelolaan Penyakit Kronis (Prolanis) pada penyakit hipertensi di Puskesmas Jetis Kota Yogyakarta. Jurnal Kebijakan Kesehatan Indonesia, 8(2), 51–58. https://doi.org/10.22146/jkki.37546

Ministry of Health of the Republic of Indonesia. (2021). Keputusan Menteri Kesehatan Republik Indonesia Nomor HK.01.07/MENKES/4634/2021 tentang Pedoman Nasional Pelayanan Kedokteran Tata Laksana Hipertensi Dewasa. https://jdih.kemkes.go.id/documents/keputusan-menteri-kesehatan-nomor-hk0107menkes46342021

Ministry of Health of the Republic of Indonesia. (2022). Klub PROLANIS UPK: Berteman dengan hipertensi dan diabetes melitus. Unit Pelayanan Kesehatan Kementerian Kesehatan.

Morisky, D. E., Ang, A., Krousel-Wood, M., & Ward, H. J. (2008). Predictive validity of a medication adherence measure in an outpatient setting. Journal of Clinical Hypertension, 10(5), 348–354. https://doi.org/10.1111/j.1751-7176.2008.07572.x

NCD Risk Factor Collaboration (NCD-RisC). (2021). Worldwide trends in hypertension prevalence and progress in treatment and control from 1990 to 2019: A pooled analysis of 1201 population-representative studies with 104 million participants. The Lancet, 398(10304), 957–980. https://doi.org/10.1016/S0140-6736(21)01330-1

Nurdin, N., Marsia, M., & Baedlawi, A. (2023). Hubungan kepatuhan minum obat anti hipertensi terhadap penurunan tekanan darah pada pasien hipertensi di Puskesmas Parit Timur Kubu Raya. Scientific Journal of Nursing Research, 5(2), 21–26.

Oliveira-Filho, A. D., Barreto-Filho, J. A., Neves, S. J. F., & Lyra Junior, D. P. (2012). Association between the 8-item Morisky Medication Adherence Scale (MMAS-8) and blood pressure control. Arquivos Brasileiros de Cardiologia, 99(1), 649–658. https://doi.org/10.1590/S0066-782X2012005000053

Unger, T., Borghi, C., Charchar, F., Khan, N. A., Poulter, N. R., Prabhakaran, D., Ramirez, A., Schlaich, M., Stergiou, G. S., Tomaszewski, M., Wainford, R. D., Williams, B., & Schutte, A. E. (2020). 2020 International Society of Hypertension global hypertension practice guidelines. Journal of Hypertension, 38(6), 982–1004. https://doi.org/10.1097/HJH.0000000000002453

Vrijens, B., De Geest, S., Hughes, D. A., Kardas, P., Demonceau, J., Ruppar, T., Dobbels, F., Fargher, E., Morrison, V., Lewek, P., Matyjaszczyk, M., Mshelia, C., Clyne, W., Aronson, J. K., & Urquhart, J. (2012). A new taxonomy for describing and defining adherence to medications. British Journal of Clinical Pharmacology, 73(5), 691–705. https://doi.org/10.1111/j.1365-2125.2012.04167.x

Wirakhmi, I. N., & Purnawan, I. (2021). Hubungan kepatuhan minum obat dengan tekanan darah pada penderita hipertensi. Jurnal Ilmu Keperawatan dan Kebidanan, 12(2), 327–333. https://doi.org/10.26751/jikk.v12i2.1079

World Health Organization. (2021). Guideline for the pharmacological treatment of hypertension in adults. World Health Organization. https://www.who.int/publications/i/item/9789240033986

World Health Organization. (2023). Hypertension. World Health Organization. https://www.who.int/news-room/fact-sheets/detail/hypertension

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