

Impact of Pharmaceutical Care on Clinical Outcomes and Quality of Life in Hypertensive Patients

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ABSTRACT

The global hypertension crisis, often described as a "silent killer" due to its asymptomatic progression, demands a strategic transition toward patient-oriented pharmaceutical care. This study evaluates the clinical and humanistic impact of pharmacist-led interventions on hypertensive patients at Apotek, Kandis, Riau. Utilizing a prospective cohort design, we followed 80 patients (N=80) over a five-month period from July to November 2025. The intervention protocol comprised structured face-to-face counseling, systematic follow-ups via digital communication, and the distribution of educational leaflets covering dietary modifications (DASH), salt reduction, and trigger identification. Baseline assessments revealed significant therapeutic gaps, with 60% of the cohort exhibiting low medication adherence and a high prevalence of Drug-Related Problems (DRPs), primarily linked to effectiveness issues (87.20%). DRPs were reduced by 95.51% ($p < 0.001$), specifically addressing patient failure to understand instructions (C7.10). Clinical outcomes demonstrated a statistically significant mean blood pressure reduction from 165.64/99.59 mmHg to

131.00/83.31 mmHg ($p < 0.001$). Furthermore, the quality of life utility scores (EQ-5D-5L) improved from a baseline of 0.59 to 0.97 ($p < 0.001$). These findings underscore the strategic necessity of institutionalizing pharmaceutical care to optimize therapeutic goals and mitigate cardiovascular risk.

Keywords: Hypertension, pharmaceutical care, DRPs, patient adherence, Quality of Life

INTRODUCTION

Pharmaceutical services are direct services provided to patients regarding pharmaceutical preparations to achieve optimal therapeutic outcomes and improve patients' quality of life. In practice, pharmaceutical services are no longer drug-oriented but have evolved into patient-centered services in accordance with the Standards for Pharmaceutical Services in Pharmacies as stipulated in Regulation of the Minister of Health of the Republic of Indonesia No. 73 of 2016.

Hypertension is a noncommunicable disease that poses a major health problem both globally and in Indonesia. This condition is characterized by a persistent increase in systolic blood pressure of ≥ 140 mmHg

and/or diastolic blood pressure of ≥ 90 mmHg. Hypertension is often referred to as a “silent killer” because it generally causes no symptoms but can lead to various serious complications, such as heart disease, stroke, and kidney failure, if not managed properly. Data from the 2018 Basic Health Research survey show that the prevalence of hypertension in Indonesia reached 34.1%, an increase from 25.8% in 2013.

The success of hypertension management depends not only on the pharmacological therapy provided, but also on patient adherence to treatment and lifestyle changes. In this regard, pharmacists play a crucial role by providing medication information, counseling, monitoring drug therapy and side effects, and delivering home pharmacy care. Various studies indicate that pharmacist involvement in the management of patients with hypertension can improve treatment adherence, control blood pressure, and enhance patients’ quality of life.

Nevertheless, the implementation of pharmaceutical care in pharmacies still faces various challenges. Several studies report that the application of pharmaceutical service standards, particularly regarding pharmaceutical care and patient counselling, has not been fully optimized. The low level of patient-centered service delivery may lead to patients’ lack of understanding of their condition and treatment, which can ultimately affect the success of therapy.

According to Regulation of the (Ministry of Health of the Republic of Indonesia, 2016),

pharmaceutical services at pharmacies include medication information, counseling, medication therapy monitoring, monitoring of medication side effects, and home pharmacy care. These services are essential for patients with hypertension who require long-term therapy and ongoing monitoring to prevent complications.

This study was designed to demonstrate the empirical impact of pharmaceutical care on patient health outcomes at the pharmacy level through systematic monitoring.

MATERIALS & METHODS

Study Design, Location, and Period

This study is a quasi-experimental study with a prospective cohort design conducted among patients with hypertension who filled prescriptions at Pharmacy in Kandis, Riau, from July to November 2025. Study subjects were selected through purposive sampling based on the following inclusion criteria: hypertensive patients aged ≥ 18 years, diagnosed with hypertension for more than 2 months, without complications, and willing to participate in the study. A total of 30 patients were included in this study

Intervention Protocol

The intervention consisted of the provision of pharmaceutical care, including counseling, education, medication information, and leaflets on hypertension. Monitoring was conducted over a 3-month period with monthly follow-ups. The parameters evaluated are shown in **Table 1**.

Table 1. Patient monitoring parameters

Variable	Measurement Tool	Reference
Drug-Related Problems	Pharmaceutical Care Network Europe (PCNE) V9.0	(Pharmaceutical Care Network Europe Association, 2020)
Clinical Outcomes	Digital Tensiometer (Blood Pressure in mmHg)	-
Quality of Life (QoL)	EuroQol 5-Dimension 5-Level (EQ-5D-5L)	(EuroQol Research Foundation, 2018)

Statistical Analysis

Normality was assessed using the Shapiro-Wilk test. Given the non-normal distribution, the Wilcoxon Signed-Rank

Test was utilized for pre- and post-test comparisons, with significance set at $p < 0.05$.

RESULT & DISCUSSION

Demographic Characteristics of Patients

Analysis of the demographic data reveals a patient profile dominated by certain vulnerable groups (**Table 2**).

Table 2. Demographic Characteristics of Respondents (n=80)

Characteristic	Category	n (80)	Percentage (%)
Gender	Female	60	75%
	Male	20	25%
Age	≤ 60 years	55	69%
	> 60 years	25	31%

The predominance of female participants (75%) over male participants is consistent with a study by Wahyuni & Lubis, 2018 in the city of Medan, which noted a higher prevalence of hypertension among women. This highlights the urgency of a personalized educational approach for women to raise awareness of early detection and lifestyle management.

The age distribution is also dominated by those under 65 years of age. The 35–65 age group is considered to be the most affected by hypertension combined with obesity. This is evident from a survey conducted by the Framingham Heart Study, in which two-

thirds of the 5,209 participants were aged 35–65. Data from Basic Health Research (RISKESDAS) also show the same trend, indicating that the prevalence of hypertension and obesity is higher among those aged 35–65 (Ministry of Health of the Republic of Indonesia, 2018; Sulastri et al., 2012).

Analysis of Drug-Related Problems (DRPs)

The DRPs study was conducted using PCNE version 9.0. DRPs incidents were classified based on problem group and cause categories.

Table 3. Results of Drug-Related Problems (DRPs) After Intervention (Problem Classification)

Code	Problem Classification (Problem/P)	Pre-Test		Post-Test		Reduction (%)
		n (80)	Percentage (%)	n (80)	Percentage (%)	
P	Problems	86	100.00	3	3.48	95.51
P.1	Treatment Effectiveness	75	87.20	3	3.48	96.00
P.1.2	Effect of Drug Treatment Not Optimal	75	87.20	3	3.48	96.00
P.2	Treatment Safety	10	11.62	0	0.00	100.00
P.2.1	Adverse Drug Event Occurred	10	11.62	0	0.00	100.00
P.3	Others	1	1.16	0	0.00	100.00
P.3.3	Drug-Related Problem Unclear	1	1.16	0	0.00	100.00

Table 4. Results of Drug-Related Problems (DRPs) After Intervention (Cause Classification)

Code	DRP Cause Classification	Pre-Test		Post-Test		Reduction (%)
		n (80)	Percentage (%)	n (80)	Percentage (%)	
C	Causes of DRPs	133	100.00	5	3.75	96.24
C.6	Drug Use Process	6	4.51	5	3.75	16.60
C.6.2	Insufficient Drug Administered	6	4.51	0	0.00	100.00
C.7	Patient-Related Factors	127	95.48	0	0.00	100.00
C.7.1	Patient Uses Less Drug Than Prescribed or Does Not Use the Drug at All	76	57.14	0	0.00	100.00
C7.8	Patient Uses the Drug Incorrectly	2	1.50	0	0.00	100.00
C7.10	Patient Unable to Understand Instructions Correctly	49	36.84	5	3.75	92.34

The PCNE V9.0 classification revealed a massive 95.51% reduction in treatment-related problems. During the pre-test phase, 86 primary problems were identified (primarily in category P1.2: suboptimal treatment effects). The main causes of DRPs (causes/C) were found in categories C7.1 (patients taking fewer medications, 57.14%) and C7.10 (patients not understanding instructions correctly, 36.84%).

Through intensive education and the use of visual aids (leaflets), patient understanding was fundamentally improved. This contrasts with a study by (Zhu et al., 2019), which noted that without pharmaceutical

interventions, medication selection errors and usage errors accounted for up to 73.5% of treatment failures. The reduction in DRPs to just 3 issues by the final stage demonstrates the effectiveness of pharmacists' role in the early identification of treatment risks

Clinical Outcomes and Achievement of JNC 8 Targets

Clinical improvement in patients is the most objective indicator of pharmaceutical care. A statistically significant decrease in blood pressure ($p < 0.001$) was observed, as detailed in **Table 5**.

Table 5. Comparison of Blood Pressure Before and After the Intervention

Parameters	Pre-test (Mean $\pm$ SD)	Post-test (Mean $\pm$ SD)
Systolic	165.64 $\pm$ 26.24 mmHg	131.00 $\pm$ 8.93 mmHg
Diastolic	99.59 $\pm$ 17.99 mmHg	83.31 $\pm$ 4.94 mmHg

According to the JNC 8 guidelines, the effectiveness of therapy is measured by the achievement of target goals. At the end of the study, 71 of 80 patients (88.75%) successfully achieved their blood pressure targets. Specifically, 47 of 55 patients aged <60 years achieved their targets, and 24 of 25 patients aged >60 years achieved theirs. This success was also supported by the role of pharmacists in monitoring side effects; for example, one patient switched from an ACEI (Captopril) to a CCB (Amlodipine) after a pharmacist identified a complaint of a dry cough a crucial step in maintaining adherence (Jones et al., 2025).

Quality of Life (EQ-5D-5L)

The quality-of-life utility score increased from 0.59 ± 0.13 to 0.97 ± 0.07 ($p < 0.001$). This increase reflects improvements in the physical (mobility) and psychological (reduction in anxiety) dimensions. These results are consistent with the study by (Dewanti et al., 2015), which found that pharmacist counseling has a strong positive correlation with patients' self-efficacy and quality of life. Education is not merely a supplement to the transaction but a determinant that reduces the risk of fatal

complications through a holistic understanding of the patient.

CONCLUSION

Pharmacy care led by pharmacists significantly improves medication adherence, eliminates most drug-related risks (DRPs), stabilizes blood pressure to meet JNC 8 targets, and markedly improves quality of life. This intervention is a fundamental requirement in the management of chronic diseases in the community setting. The pharmaceutical intervention successfully reduced the incidence of DRPs by 95.51%, particularly in addressing barriers to understanding instructions (C7.10). There was a marked improvement in clinical outcomes, with 88.75% of subjects achieving JNC 8 targets, and patients' quality of life improved substantially toward a state of perfect health (utility score of 0.97).

Declaration by Authors

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REFERENCES

1. Dewanti, S. W., Andrajati, R., & Supardi, S. (2015). Pengaruh Konseling dan Leaflet terhadap Efikasi Diri, Kepatuhan Minum Obat, dan Tekanan Darah Pasien Hipertensi di Dua Puskesmas Kota Depok. *Jurnal Kefarmasian Indonesia*, 5(1), 33–40. <https://doi.org/10.22435/jki.v5i1.4088.33-40>
2. EuroQol Research Foundation. (2018). EQ-5D-3L User Guide: Basic Information on How to Use the EQ-5D-3L Instrument. EuroQol Research Foundation.
3. Jones DW, Ferdinand KC, Taler SJ, Johnson HM, Shimbo D, Abdalla M, et al. 2025
AHA/ACC/AANP/AAPA/ABC/ACCP/ACPM/AGS/AMA/ASPC/NMA/PCNA/SGIM Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *J Am Coll Cardiol*. 2025 Nov 4;86(18):1567-1678. doi: 10.1016/j.jacc.2025.05.007. Epub 2025 Aug 14. Erratum in: *J Am Coll Cardiol*. 2025 Nov 4;86(18):1679. doi: 10.1016/j.jacc.2025.10.006. Erratum in: *J Am Coll Cardiol*. 2026 Jun 16;87(23):3379. doi: 10.1016/j.jacc.2026.04.021.
4. Ministry of Health of the Republic of Indonesia. (2016). Regulation of the Minister of Health of the Republic of Indonesia Number 73 of 2016 concerning Standards of Pharmaceutical Services in Community Pharmacies. Ministry of Health of the Republic of Indonesia.
5. Ministry of Health of the Republic of Indonesia. (2018). Basic Health Research (Riskesdas) 2018 (pp. 156–160). Ministry of Health of the Republic of Indonesia.
6. Pharmaceutical Care Network Europe Association. (2020). PCNE classification for drug-related problems (version 9.1). Pharmaceutical Care Network Europe Association.
7. Sulastri, D., Elmatris, E., & Ramadhani, R. (2012). HUBUNGAN OBESITAS DENGAN KEJADIAN HIPERTENSI PADA MASYARAKAT ETNIK MINANGKABAU DI KOTA PADANG. *Majalah Kedokteran Andalas*, 36(2), 188. <https://doi.org/10.22338/mka.v36.i2.p188-201.2012>
8. Wahyuni, A. S., & Lubis, I. R. (2018). Kualitas Hidup Pasien Hipertensi Tanpa Komplikasi di Daerah Puskesmas Medan Labuhan. *Talenta Conference Series: Tropical Medicine (TM)*, 1(2), 374–380. <https://doi.org/10.32734/tm.v1i2.219>
9. Zhu, Y., Liu, C., Zhang, Y., Shi, Q., Kong, Y., Wang, M., Xia, X., & Zhang, F. (2019). Identification and resolution of drug-related problems in a tertiary hospital respiratory unit in China. *International Journal of Clinical Pharmacy*, 41(6), 1570–1577. <https://doi.org/10.1007/s11096-019-00922-3>

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