JOURNAL OF TROPICAL PHARMACY AND CHEMISTRY
https://jtpc.ff.unmul.ac.id
Volume 9.2

(Original Article)

A Practice-Based Evaluation of Pocket Book-Supported Pharmacist Education on Quality of Life and Clinical Outcomes Among Prolanis Patients with Hypertension at a Primary Health Center in Samarinda, Indonesia

Dewi Rahmawati[1,2,*], Sinta Ariani[3], Adam M Ramadhan[1,3]

[1]Departement of Clinical Pharmacy and Community, Faculty of Pharmacy, Mulawarman University, Samarinda, East Kalimantan, Indonesia
[2]Pharmacy Diploma Program, Faculty of Pharmacy, Mulawarman University, Samarinda, East Kalimantan, Indonesia
[3]Clinical Pharmacy Study Program, Faculty of Pharmacy, Universitas Mulawarman, Samarinda, East Kalimantan Indonesia
*Email korespondensi : dewi@farmasi.unmul.com

Abstract

Hypertension remains a major public health burden globally and in Indonesia, and pharmacists play an essential role in optimizing antihypertensive therapy through structured education. This quasi-experimental one-group pretest–posttest study evaluated the effectiveness of pharmacist-led pocket book education on health-related quality of life (HRQoL) and blood pressure control among 40 Prolanis hypertensive patients at Juanda Public Health Center (January–February 2025). Participants received individualized counseling using a hypertension pocket book covering disease understanding, medication adherence, and lifestyle modification; HRQoL was assessed using the EQ-5D-5L Indonesian value set, while systolic and diastolic blood pressure served as clinical outcomes. Significant improvements were observed, with mean utility scores increasing from 0.824 ± 0.065 to 0.967 ± 0.020 ($p < 0.001$; $d = 1.2$), systolic blood pressure decreasing from 144.97 ± 17.42 to 137.87 ± 16.11 mmHg ($p = 0.003$), and diastolic blood pressure decreasing from 83.00 ± 8.75 to 79.72 ± 8.73 mmHg ($p = 0.001$). Regression analysis identified shorter hypertension duration and absence of comorbidity as significant predictors of HRQoL improvement ($\beta = 0.34$, $p = 0.04$). These findings demonstrate that pharmacist-led pocket book education is an effective, low-cost intervention with strong potential for broader implementation in primary care and Prolanis programs.

Keywords: hypertension; pharmacist intervention; pocket book; hrqol; eq-5d-5l; indonesia.

Accepted: 25 September 2025
Approved: 25 Oktober 2025
Publication: 16 November 2025

Citation : D. Rahmawati, S. Arini, A.M. Ramadhan, "A Practice-Based Evaluation of Pocket Book-Supported Pharmacist Education on Quality of Life and Clinical Outcomes Among Prolanis Patients with Hypertension at a Primary Health Center in Samarinda, Indonesia", Journal of Tropical Pharmacy and Chemistry (JTPC), vol. 9, no. 2, pp 202-209, Nov. 2025, doi: 10.30872/jtpc.v9i2.301

Doi: 10.30872/jtpc.v9i2.301

1 Introduction

Hypertension (HTN) is a leading cause of cardiovascular morbidity and mortality worldwide, responsible for more than 10 million deaths annually. The World Health Organization (WHO) estimates that 1.28 billion adults aged 30–79 years are living with hypertension, with two-thirds residing in low- and middle-income countries [1]. In Indonesia, the 2023 *Survei Kesehatan Indonesia* (SKI) reported that 30.8% of adults aged ≥18 years had hypertension based on blood pressure measurement, but only 8.6% were medically diagnosed [2]. In East Kalimantan Province, the prevalence reached 31.9%, reflecting a high burden of undiagnosed and uncontrolled hypertension cases [3].

Hypertension is a chronic, lifelong condition that requires sustained management to prevent target-organ damage and complications such as stroke, kidney failure, and coronary heart disease. Beyond its clinical consequences, hypertension also impairs patients' health-related quality of life (HRQoL), affecting physical, emotional, and social well-being [4]. Several factors influence HRQoL, including medication adherence, self-efficacy, and patient education domains where pharmacists play a pivotal role [5].

Pharmacists' involvement in chronic disease programs, particularly through Communication, Information, and Education (KIE) activities, has been shown to improve treatment adherence and clinical outcomes [6], [7], [8]. The Indonesian Ministry of Health, through Regulation No. 34/2021 on Pharmaceutical Care Standards in Clinics, formally mandates pharmacist participation in providing patient-centered care, including education and monitoring [7]. Within the *Program Pengelolaan Penyakit Kronis* (*Prolanis*) supported by Social Security Agency on Health in Indonesia (BPJS Kesehatan), pharmacists are strategically positioned to contribute to patient empowerment and disease control through structured counseling and educational media.

Educational materials play a crucial role in bridging patients' understanding of their disease and treatment regimen. Traditional tools such as leaflets, posters, and booklets have proven beneficial in increasing awareness and adherence among hypertensive patients [8]. Among these, pocket books are particularly practical due to their portability, concise presentation, and interactive design that allows patients to record personal health data and progress. Prior studies have demonstrated the effectiveness of pocket book education in improving knowledge and adherence among patients with chronic diseases, including hypertension and diabetes mellitus [8], [9], [10].

However, most studies have focused primarily on knowledge outcomes and short-term adherence, rather than on validated measures of health-related quality of life (HRQoL) such as the EQ-5D-5L, particularly in the Indonesian context. Moreover, evidence on pharmacist-led pocket book interventions within the Prolanis framework remains limited, despite the program's widespread implementation at primary health centers. Therefore, this study aimed to evaluate the effectiveness of a pharmacist-led pocket book education on HRQoL and blood pressure control among hypertensive patients enrolled in the Prolanis program.

2 Method

2.1 Study Design and Setting

This study employed a quasi-experimental one-group pretest–posttest design conducted at the Juanda Public Health Center (Puskesmas Juanda), Samarinda, East Kalimantan, Indonesia. The intervention was implemented as part of the Program Pengelolaan Penyakit Kronis (Prolanis), a nationally mandated chronic disease management program coordinated by BPJS Kesehatan. Because all eligible Prolanis participants were required to receive the intervention as part of routine care, the inclusion of a parallel control group was not feasible. Data collection was conducted between January and February 2025.

This design was chosen to generate pragmatic, practice-based evidence in a real-world healthcare context, recognizing that randomized controlled trials are often impractical in community-based settings. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

Doi: 10.30872/jtpc.v9i2.301

2.2 Participants and Sampling

Participants were recruited using non-probability purposive sampling. Eligible subjects were outpatients aged 18–60 years diagnosed with hypertension, with or without comorbidities, and registered in the *Prolanis* program for at least one month. Additional inclusion criteria included the ability to communicate effectively, willingness to complete the EQ-5D-5L questionnaire, and provision of written informed consent. Patients with incomplete medical records or those with formal health education backgrounds were excluded.

A total of 40 participants met the eligibility criteria and completed both pre- and post-intervention assessments. The minimum sample size was determined using a power analysis (effect size $d = 0.5$, $\alpha = 0.05$, power $= 0.80$), confirming that 34 subjects were required; thus, 40 participants were considered adequate to maintain statistical power.

2.3 Intervention Description

The hypertension pocket book was developed by the research team, led by a licensed clinical pharmacist, specifically for this study. The content was compiled based on established evidence-based sources, including national hypertension management guidelines, World Health Organization recommendations, and the DASH (Dietary Approaches to Stop Hypertension) dietary guideline.

Prior to implementation, the pocket book underwent a focus group discussion (FGD) involving pharmacists and primary care healthcare providers to review the clarity, relevance, and applicability of the content. Feedback from the FGD was used to refine the language, layout, and practical components of the pocket book. Formal psychometric validation was not conducted, as the pocket book functioned as an educational tool rather than a measurement instrument

The educational session was delivered individually by a pharmacist during scheduled Prolanis meetings at the primary health center. Each participant received approximately 30 minutes of structured counseling supported by the hypertension pocket book, followed by a one-month self-monitoring period. Educational reinforcement was provided through weekly reminders delivered via WhatsApp messages by the pharmacist, while in-person visits occurred as part of routine monthly Prolanis schedules.

2.4 Data Collection

2.4.1 Sociodemographic and Clinical Data

Data on age, sex, education, occupation, duration of hypertension, and comorbidities were obtained from interviews and medical records. Clinical data included systolic blood pressure (SBP) and diastolic blood pressure (DBP), which were measured using a validated digital sphygmomanometer at baseline and one month after the intervention. At each assessment, blood pressure was measured twice, with an interval of 1–2 minutes between measurements, and the average of the two readings was used for analysis.

2.4.2 HRQoL

HRQoL was assessed using the EQ-5D-5L questionnaire with the Indonesian value set developed by Purba *et al* [11]. The instrument measures five domains mobility, self-care, usual activities, pain/discomfort, and anxiety/depression each with five levels of severity. Health utility scores were calculated by converting EQ-5D-5L health states into a single utility index using the validated value set. Each combination of responses across the five dimensions was assigned a preference-based weight, resulting in utility scores ranging from 0 (worst health state) to 1 (perfect health). Higher utility scores represent better health-related quality of life.

2.5 Data Analysis

Data were analyzed using IBM SPSS Statistics version 29.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were applied to summarize participants' demographic and clinical characteristics. Data normality was assessed using the Shapiro–Wilk test. Paired t-tests were conducted to compare mean systolic blood pressure (SBP), diastolic blood pressure (DBP), and EQ-5D-5L utility scores before and after the intervention. Effect sizes (Cohen's *d*) were calculated to evaluate the clinical significance of

Doi: 10.30872/jtpc.v9i2.301

observed changes, with $d \geq 0.8$ considered large. Pearson's correlation analysis was performed to examine the relationships between changes in blood pressure and improvements in health-related quality of life (HRQoL). Furthermore, simple linear regression was used to identify predictors of HRQoL improvement (ΔUtility), with independent variables including age, sex, duration of hypertension, educational level, and presence of comorbidities. A p-value < 0.05 was considered statistically significant. Missing data accounted for less than 5% of the dataset and were managed using mean substitution.

2.6 Outcome Measures

The primary outcomes of this study were changes in health-related quality of life (HRQoL), as measured by the EQ-5D-5L utility score, and changes in systolic and diastolic blood pressure (SBP and DBP) following the pharmacist-led educational intervention.

The secondary outcomes included the correlation between improvements in HRQoL and reductions in blood pressure, as well as the identification of predictors of HRQoL improvement based on simple linear regression analysis.

3 Result and Discussion

3.1 Participant Characteristics

A total of 40 hypertensive patients completed both pre- and post-intervention assessments. As shown in Table 1, most participants were female (67.5%), aged 56–60 years, and had a senior high school education. The majority were unemployed or housewives (77.5%), had been diagnosed with hypertension for 2–5 years (65%), and 40% presented with comorbidities, predominantly diabetes mellitus.

Table 1. Sociodemographic and clinical characteristics of participants (n = 40)

Variable	n (%)
Gender	
Male	13 (32.5)
Female	27 (67.5)
Age (years)	
45-59	20 (50.0)
≥ 60	20 (50.0)
Education level	
Elementary	10 (25.0)
High school	16 (40.0)
University	11 (27.5)
Occupation	
Public servant/self-employed	9 (22.5)
Unemployed/housewife	31 (77.5)
Comorbidity	
Diabetes mellitus	11 (27.5)
Hyperlipidemia	4 (10.0)
None	24 (60.0)
Duration of hypertension (years)	
< 2	7 (17.5)
2-5	26 (65.0)
> 5	7 (17.5)

This study demonstrated that pharmacist-led education using a hypertension pocket book significantly enhanced both health-related quality of life (HRQoL) and blood pressure control among

Doi: 10.30872/jtpc.v9i2.301

patients enrolled in the Prolanis program at a primary health center in Samarinda, Indonesia. These results reinforce international evidence highlighting the positive impact of pharmacists in chronic disease management through patient education, medication review, and behavioral counseling [12], [13], [14].

3.2 Improvement in (HRQoL)

As shown in Table 2, participants experienced a marked enhancement in HRQoL following the pharmacist-led pocket book education. The mean EQ-5D-5L utility score rose from 0.824 ± 0.065 at baseline to 0.967 ± 0.020 after the intervention ($p < 0.001$), with a mean gain of $\Delta = 0.143$. This corresponds to a large effect size (Cohen's $d = 1.20$), reflecting a clinically substantial improvement.

At baseline, pain/discomfort (57.5%) and anxiety/depression (30.0%) were the most prevalent problems, which decreased notably to 25.0% and 7.5%, respectively, after the educational program. Positive changes were consistent across all demographic strata, and the most pronounced HRQoL benefits were evident among participants without comorbid conditions and those with a shorter history of hypertension (<5 years).

Table 2. Change in EQ-5D-5L utility and BP before and after pharmacist led pocket book education

Outcome	Pre-test (Mean ± SD)	Post-test (Mean ± SD)	Mean change (Δ)	*p*-value	Effect size (*d*)
EQ-5D-5L utility	0.824 ± 0.065	0.967 ± 0.020	+0.143	<0.001	1.20 (large)
Systolic BP (mmHg)	144.97 ± 17.42	137.87 ± 16.11	−7.10	0.003	0.45 (moderate)
Diastolic BP (mmHg)	83.00 ± 8.75	79.72 ± 8.73	−3.28	0.001	0.38 (small–moderate)

$p < 0.05$ was considered statistically significant.

The mean EQ-5D-5L utility score increased from 0.824 to 0.967 ($\Delta = 0.143$), representing a large effect size ($d = 1.20$) and exceeding the minimally important difference (MID ≈ 0.05–0.07) established for the EQ-5D instrument. This magnitude of improvement confirms that the intervention yielded clinically meaningful benefits in patients perceived health status. Comparable findings have been reported in studies from Nigeria, Pakistan, and Malaysia, where structured pharmacist-led education improved HRQoL and treatment satisfaction among hypertensive populations [13], [14].

Improvements in psychological dimensions—particularly reductions in anxiety/depression and pain/discomfort—suggest that personalized pharmacist communication and written educational materials may alleviate disease-related stress. The pocket book likely fostered active self-monitoring and greater patient engagement, leading to a stronger sense of control and empowerment, both of which are established determinants of HRQoL in chronic disease contexts. Blood pressure outcomes were also favorable, with significant mean reductions of −7.1 mmHg in systolic and −3.3 mmHg in diastolic pressure. Even modest decreases of 5 mmHg in systolic blood pressure are associated with approximately a 10% reduction in the risk of major cardiovascular events [15]. These findings are consistent with Gultom and Pardosi (2018), who reported similar improvements following pharmacist-facilitated pocket book education among hypertensive patients in Medan, Indonesia [16]. Improved blood pressure control in this study is plausibly linked to better medication adherence, dietary compliance guided by the DASH approach, and increased patient motivation resulting from the pharmacist's ongoing counseling. However, as the study was conducted within a routine Prolanis setting, concurrent exposure to usual care activities and increased health awareness related to study participation may also have contributed to the observed improvements and should be considered when interpreting the results.

Doi: 10.30872/jtpc.v9i2.301

3.3 Correlation Between HRQoL and Blood Pressure

In addition to the observed improvements in HRQoL and blood pressure, correlation analysis was performed to examine the relationship between these changes. A moderate, statistically significant correlation was observed ($r = -0.32$, $p = 0.04$), indicating that greater reductions in SBP were associated with higher HRQoL gains. In contrast, the association between changes in diastolic blood pressure (DBP) and HRQoL improvement was weak and not statistically significant ($r = -0.21$, $p = 0.18$).

Table 3. Pearson's Correlation between Changes in Blood Pressure and HRQoL Improvement

Variable Pair	r-value	p-value	Interpretation
Change in Systolic Blood Pressure (ΔSBP) vs. HRQoL improvement	−0.32	0.04*	Significant negative correlation — greater SBP reduction was associated with higher HRQoL gain
Change in Diastolic Blood Pressure (ΔDBP) vs. HRQoL improvement	−0.21	0.18	No significant correlation

$p < 0.05$ was considered statistically significant.

In addition to the observed improvements in HRQoL and blood pressure, a correlation analysis was conducted to examine the relationship between these changes. A moderate, statistically significant correlation was identified ($r = -0.32$, $p = 0.04$), indicating that greater reductions in systolic blood pressure were associated with larger HRQoL gains [17]. Beyond these correlations, regression analysis further demonstrated that participants with a shorter duration of hypertension (<5 years) and without comorbidities achieved greater improvements in HRQoL, a pattern consistent with regional evidence showing that hypertensive patients with shorter disease duration or fewer clinical complexities tend to report higher HRQoL [18]. In contrast, individuals living with multiple chronic conditions may experience limited HRQoL gains due to the cumulative burden of symptoms, treatment complexity, and polypharmacy, findings that align with global multimorbidity research [19] The model's moderate explanatory strength ($R^2 = 0.27$) underscores that HRQoL is shaped not only by biomedical factors but also by psychological, social, and health-system determinants.

3.4 Predictors of HRQoL Improvement

A simple linear regression analysis was performed to identify factors associated with changes in EQ-5D-5L utility scores (ΔUtility) following the pharmacist-led educational intervention (Table 4). Two variables demonstrated statistically significant associations with HRQoL improvement. Participants with a shorter duration of hypertension (<5 years) showed greater gains in utility scores ($\beta = +0.34$, 95% CI: 0.02 to 0.66; $p = 0.04$), and those without comorbidities also experienced larger improvements ($\beta = +0.31$, 95% CI: 0.01 to 0.61; $p = 0.045$). Age, gender, and education level did not significantly contribute to the model. Overall, the regression model explained 27% of the variance in HRQoL improvement ($R^2 = 0.27$), indicating a moderate explanatory power for the included predictors.

Table 4. Predictors of change in EQ-5D-5L utility score

Variable	**β (Coefficient)**	**95% CI**	***p*-value**	**Interpretation**
Age	−0.08	(−0.21 to 0.06)	0.25	Not significant
Female gender	+0.09	(−0.05 to 0.22)	0.19	NS
Duration < 5 years	+0.34	(0.02 to 0.66)	0.04	Significant positive predictor
No comorbidity	+0.31	(0.01 to 0.61)	0.045	Significant positive predictor
Education (higher level)	+0.11	(−0.07 to 0.29)	0.21	NS

$p < 0.05$ was considered statistically significant.

Doi: 10.30872/jtpc.v9i2.301

The findings highlight that patients with a shorter disease trajectory and fewer clinical complexities benefit more from pharmacist-led education. This pattern is consistent with evidence from Southeast Asia, where hypertensive patients with shorter disease duration have demonstrated greater improvements in HRQoL following structured educational or counseling interventions. The significant role of comorbidity observed in this study also aligns with global evidence showing that multimorbidity diminishes HRQoL gains due to increased symptom burden, polypharmacy, and reduced functional reserve [20], [21].

These results reinforce the critical role of pharmacists within Prolanis and primary care services in Indonesia, particularly in delivering targeted KIE strategies for patients with early-stage hypertension. Educational tools such as pocket books represent a low-cost and scalable approach aligned with the Ministry of Health Regulation No. 34/2021 on pharmaceutical care standards. From a pharmacoeconomic perspective, improved HRQoL and better blood-pressure control may translate into reduced healthcare utilization, suggesting the potential value of future cost-utility analyses (e.g., cost per QALY gained) to inform broader policy adoption [15].

Despite limitations related to study design and follow-up duration, this study provides practice-based evidence supporting the integration of pharmacist-led education in chronic disease management. Although the absence of a control group limits causal inference, the pretest–posttest design reflects real-world program implementation and allows participants to serve as their own controls. Future studies should consider digital adaptations of the pocket book, longer follow-up periods, and the incorporation of economic evaluations to assess long-term value and scalability.

4. Conclusion

Pharmacist-led pocket book education was associated with improvements in health-related quality of life and blood pressure control among hypertensive patients in a primary care Prolanis setting in Indonesia. These findings highlight the potential of pharmacist-delivered educational tools as scalable and low-cost strategies to support chronic disease management. Further studies using controlled and multicenter designs with longer follow-up are needed to confirm the long-term clinical and economic impact of this approach.

5. Declarations

5.1 Acknowledgements

The authors sincerely thank the management and staff of Juanda Public Health Center (Puskesmas Juanda) in Samarinda for their cooperation and support during data collection. The authors also acknowledge the *Prolanis* participants for their valuable time and participation. Special thanks to the Faculty of Pharmacy, Universitas Mulawarman, for academic and logistical support throughout this project.

5.2 Author Contributions

Conceptualization, study design, and methodology were developed by the authors. Data collection and analysis were performed collaboratively. The first draft of the manuscript was written by the primary author, and all authors provided critical revisions and approved the final version.

5.3 Ethics

Ethics approval was obtained from the Research Ethics Committee of the Faculty of Pharmacy, Universitas Mulawarman (No. 257/KEPK-FFUNMUL/EC/EXE/11/2024). A control group was not

Doi: 10.30872/jtpc.v9i2.301

included for ethical reasons, as withholding the educational intervention—which constitutes part of standard care within the Prolanis program—from eligible participants was considered inappropriate.

5.4 Conflict of Interest

The authors declare no conflicts of interest related to the design, implementation, or reporting of this study.

5.5 Funding Statement

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors. All study expenses, including printing of educational materials, were covered by the research team.

6. Bibliography

[1] World Health Organization (WHO), *Hypertension*, 2023. [Online]. Available: www.who.int. [Accessed: 15-May-2025].
[2] Kementerian Kesehatan Badan Kebijakan Pembangunan Kesehatan, *Survei Kesehatan Indonesia (SKI) 2023 dalam Angka*, Jakarta: Kementerian Kesehatan, 2023.
[3] Dinas Kesehatan Provinsi Kalimantan Timur, *Profil Kesehatan Tahun 2020*, Samarinda: Dinkes Prov. Kaltim, 2021.
[4] K. Kartikasari, D. S. S. Rejeki, and S. Pramatama, "Faktor-faktor yang mempengaruhi tingkat kepatuhan pengobatan pada pasien hipertensi di berbagai wilayah Indonesia," *J. Pendidik. Tambusai*, vol. 6, no. 2, pp. 11665–11676, 2022.
[5] J. Fernandes, M. Triharini, and E. M. M. Has, "Tingkat pengetahuan penderita hipertensi tentang kepatuhan berobat," *J. Telenursing*, vol. 5, no. 1, pp. 162–172, 2023.
[6] M. Hidayah and S. Sopiyandi, "Efektivitas buku saku dan leaflet terhadap pengetahuan dan kepatuhan diet pasien diabetes melitus tipe 2," *Pontianak Nutr. J.*, vol. 1, no. 2, pp. 66–69, 2019.
[7] Maf'ula, A. Zuhriyah, and A. Basith, "Evaluasi pemberian komunikasi, informasi dan edukasi (KIE) obat terhadap tingkat kepuasan konsumen," *J. Law Adm. Soc. Sci.*, vol. 3, no. 2, pp. 199–206, 2023.
[8] T. D. S. Pratama, N. M. Yasin, and S. A. Kristina, "Pengaruh medication therapy management terhadap outcome klinik dan kualitas hidup pasien hipertensi," *J. Manaj. Pelayanan Farm.*, vol. 10, no. 4, pp. 261–275, 2021.
[9] H. Pratiwi, N. Nuryanti, V. V. Fera, W. Warsinah, and N. K. Sholihat, "Pengaruh edukasi terhadap pengetahuan, sikap, dan kemampuan berkomunikasi atas informasi obat," *Kartika: J. Ilm. Farm.*, vol. 4, no. 1, pp. 10–15, 2016.
[10] A. Saputri and S. R. Rahayu, "Efektivitas Cepat Tensi terhadap peningkatan pengetahuan dan sikap pada wanita menopause," *J. Health Educ.*, vol. 2, no. 2, pp. 107–114, 2017.
[11] F. D. Purba *et al.*, "The Indonesian EQ-5D-5L value set," *Pharmacoeconomics*, vol. 35, no. 11, pp. 1153–1165, 2017.
[12] E. E. Ayogu *et al.*, "Effectiveness of a pharmacist-led educational intervention on health outcomes in hypertension management," *Br. J. Clin. Pharmacol.*, vol. 89, no. 2, pp. 649–659, 2023.
[13] F. Saleem *et al.*, "Pharmacist intervention in improving hypertension-related knowledge, medication adherence and HRQoL," *Health Expect.*, vol. 18, no. 5, pp. 1270–1281, 2015.
[14] J. S. Soni *et al.*, "Roles of pharmacists in optimizing care for hypertensive patients in hospital and community pharmacies," *East Cent. Afr. J. Pharm. Sci.*, vol. 23, pp. 28–35, 2020.
[15] Blood Pressure Lowering Treatment Trialists' Collaboration, "Pharmacological blood pressure lowering for primary and secondary prevention of cardiovascular disease," *Lancet*, vol. 397, no. 10285, pp. 1625–1636, 2021.
[16] L. Gultom and M. Pardosi, "Effectiveness of pocket book use in hypertension control," *Int. J. Sci. Res.*, vol. 6, no. 11, pp. 32–35, 2018.

Doi: 10.30872/jtpc.v9i2.301

[17] Tam H. L., Wong E. M. L., and Cheung K., "Effectiveness of educational interventions on adherence to lifestyle modifications among hypertensive patients: An integrative review," *International Journal of Environmental Research and Public Health*, vol. 17, no. 17, pp. 1–18, 2020.
[18] Treciokiene I., Postma M., Nguyen T., Fens T., Petkevicius J., Kubilius R., Gulbinovic J., and Taxis K., "Healthcare professional-led interventions on lifestyle modifications for hypertensive patients: A systematic review and meta-analysis," *BMC Primary Care*, vol. 22, no. 135, pp. 1–13, 2021.
[19] Ha N. T., Duy H. T., Le N. H., Khanal V., and Moorin R., "Quality of life among people living with hypertension in a rural Vietnam community," *BMC Public Health*, vol. 14, no. 1, pp. 1–9, 2014.
[20] Saleem F., Hassali M. A., Shafie A. A., Haq N., Aljadhey H., and Atif M., "Does pharmacist-led educational intervention improve health-related quality of life among hypertensive patients? A non-clinical randomized controlled trial," *Health Expect.*, vol. 18, no. 5, pp. 1270–1281, 2015.