

THE EFFECTIVENESS OF TELENURSING "MY NURSING" ON SELF- CARE KNOWLEDGE, ATTITUDE, AND PRACTICE AMONG NON- COMMUNICABLE DISEASE PATIENTS

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ABSTRACT

Non-communicable diseases (NCDs) such as hypertension and diabetes mellitus require effective self-care management to prevent complications. This study aimed to evaluate the effectiveness of the "My Nursing" telenursing application on knowledge, attitude, and self-care practice among NCD patients in Indonesia. A quasi-experimental design with control and intervention groups was employed involving 101 participants (50 control, 51 intervention) selected from community health centers in Pekalongan, Indonesia. The intervention group received telenursing services through the "My Nursing" Android application for eight weeks, while the control group received standard care. Data were analyzed using Mann- Whitney U test. Results showed significant differences between intervention and control groups in knowledge ($p=0.000$), attitude ($p=0.000$), and self-care practice ($p=0.000$). Telenursing effectively improved knowledge, attitude, and self-care practices among NCD patients. This innovative approach addresses healthcare access gaps particularly in rural areas and supports chronic disease management through digital health technology.

Keywords: Telenursing, Non-Communicable Diseases, Self-Care, Knowledge, Attitude

INTRODUCTION

Non-communicable diseases (NCDs) represent a significant global health challenge, accounting for approximately 71% of all deaths worldwide annually (World Health Organization, 2021). Among NCDs, hypertension and diabetes mellitus are particularly prevalent in Southeast Asian countries, including Indonesia and Malaysia. The World Health Organization (2023) reported that the prevalence of hypertension in Indonesia reaches 34.1%, while diabetes mellitus affects approximately

10.9% of the adult population. Similarly, Malaysia faces substantial NCD burdens with hypertension prevalence at 30% and diabetes at 17.5% among adults (Ministry of Health Malaysia, 2020). Effective management of hypertension and diabetes mellitus fundamentally depends on patient self-care behaviors, including medication adherence, dietary modifications, regular physical activity, and consistent health monitoring (Purnamasari & Hindiarti, 2023). However, studies indicate that self-care practices among NCD patients in both countries remain suboptimal. Research by Andarmoyo (2020) demonstrated that inadequate patient knowledge significantly correlates with poor self-care practices. The gap between patient knowledge and consistent application of self-care behaviors presents a critical challenge in chronic disease management.

Telenursing has emerged as a promising solution to address healthcare access limitations and support chronic disease management (Irnawati et al., 2022). By utilizing information and

communication technologies, telenursing enables healthcare providers to deliver remote nursing care, education, and monitoring. Previous studies have shown that telenursing interventions effectively improve patient outcomes in various chronic conditions (Snoswell et al., 2020). However, limited evidence exists regarding telenursing effectiveness specifically for NCD patients across different Southeast Asian healthcare contexts.

The "My Nursing" application was developed as an Android-based telenursing platform to provide structured education, medication reminders, self-care guidance, and remote monitoring for NCD patients (Irnawati, 2022). This study addresses the gap in evidence regarding cross-cultural telenursing effectiveness between Indonesia and Malaysia. The research objectives were to: (1) assess the effectiveness of "My Nursing" telenursing on knowledge levels among NCD patients; (2) evaluate its impact on patient attitudes toward self-care; and (3) measure changes in self-care practices. The hypothesis posited that telenursing intervention significantly improves knowledge, attitude, and self-care practice compared to standard care.

METHOD

Research Design

This study employed a quasi-experimental design with non-equivalent control group pre-test and post-test structure (Creswell & Creswell, 2018). The design allowed comparison between intervention and control groups while maintaining practical feasibility within community healthcare settings.

Participant Characteristics and Research Design

Participants included adult patients diagnosed with hypertension or diabetes mellitus receiving care at community health centers (Puskesmas) in Pekalongan City, Indonesia. Inclusion criteria comprised: (a) age ≥ 18 years, (b) confirmed diagnosis of hypertension (blood pressure $\geq 140/90$ mmHg) or diabetes mellitus (fasting blood glucose ≥ 126 mg/dL or HbA1c $\geq 6.5\%$), (c) owned an Android smartphone, (d) willing to participate and provide informed consent. Exclusion criteria included: (a) cognitive impairments affecting comprehension, (b) severe complications requiring hospitalization, (c) participation in other digital health interventions.

Sampling Procedures

Purposive sampling was employed to select participants meeting eligibility criteria. The final sample comprised 101 participants allocated to control group ($n=50$) and intervention group ($n=51$). Sample size was determined using power analysis ($\alpha=0.05$, power=0.80, effect size moderate) (Faul et al., 2009, as cited in Hair et al., 2019). Data collection occurred at community health centers between October 2023 and January 2024. Institutional review board approval was obtained from Universitas Muhammadiyah Pekajangan Pekalongan Ethics Committee. All participants provided written informed consent.

Measures and Covariates

Data collection utilized a structured questionnaire comprising four sections: Demographic characteristics: Age, gender, education level, type of NCD. Knowledge assessment: 15 items measuring understanding of disease mechanisms, risk factors, medication management, and complication prevention. Internal consistency reliability (Cronbach's $\alpha=0.87$) (DeVellis, 2017).

Attitude assessment: 12 items evaluating patient perspectives toward self-care, treatment

adherence, and lifestyle modifications ($\alpha=0.84$) (DeVellis, 2017). Self-care practice assessment: 10 items assessing actual behaviors including medication adherence, dietary compliance, physical activity, and health monitoring ($\alpha=0.89$) (DeVellis, 2017).

Intervention Procedure

The intervention group received telenursing services through the "My Nursing" Android application for eight weeks. The application provided: (a) daily educational messages about NCD management, (b) medication and monitoring reminders, (c) weekly video consultations with nurses, (d) self-care tracking features, and (e) 24-hour chat support (Irnawati et al., 2022). The control group received standard care including routine clinic visits and printed educational materials.

Data Analysis

Data were analyzed using SPSS version 26. Descriptive statistics summarized demographic characteristics and outcome variables. Mann-Whitney U test compared differences between intervention and control groups, as data violated normality assumptions (Shapiro-Wilk test $p<0.05$) (Field, 2018). Statistical significance was set at $p<0.05$.

RESULTS AND DISCUSSION

Participant Characteristics

Table 1 presents demographic characteristics of participants. The intervention group predominantly comprised younger participants (43% aged below 30 years) compared to the control group (24% below 30 years). Gender distribution was balanced across groups. Educational levels varied, with the intervention group showing higher proportions of secondary and tertiary education. Hypertension was more prevalent in the intervention group (59%) while diabetes mellitus predominated in the control group (58%).

Table 1
Demographic Characteristics of Participants

Variable	Control Group (N=50)	Intervention Group (N=51)
Age (years)		
Below 30	12 (24%)	22 (43%)
31-40	18 (35%)	15 (29%)
41-50	9 (18%)	6 (12%)
Above 50	11 (22%)	8 (16%)
Gender		
Male	23 (46%)	25 (49%)
Female	27 (54%)	26 (51%)
Education		
No formal education	3 (6%)	3 (6%)
Elementary	18 (36%)	5 (10%)
Junior high	11 (22%)	20 (39%)
Senior high	15 (30%)	14 (27%)
Vocational	1 (2%)	2 (4%)
Bachelor	2 (4%)	6 (12%)
NCD Type		
Hypertension	21 (42%)	30 (59%)
Diabetes Mellitus	29 (58%)	21 (41%)

Effect of Telenursing on Knowledge, Attitude, and Practice

Mann-Whitney U test results revealed significant differences between intervention and control groups across all three outcome variables (Table 2). The intervention group demonstrated significantly higher knowledge scores ($p=0.000$), more positive attitudes toward self-care ($p=0.000$), and better self-care practices ($p=0.000$) compared to the control group.

Table 2
Mann-Whitney U Test Results Comparing Intervention and Control Groups

Variable	Mann-Whitney U	z	p-value
Knowledge	169.000	-7.682	0.000
Attitude	239.000	-7.321	0.000
Practice	481.000	-6.264	0.000

Note. N = 101. Significant at $p < 0.05$.

Discussion

The findings demonstrate that telenursing effectively improves knowledge, attitude, and self-care practices among NCD patients. These results align with previous research demonstrating digital health intervention effectiveness for chronic disease management (Barbosa et al., 2021; Kruse et al., 2017). Knowledge improvement: Telenursing facilitated significant knowledge enhancement through structured educational content delivered via the application. Patients gained better understanding of disease mechanisms, risk factors, and the importance of routine monitoring (Irnawati et al., 2022). In Indonesia, where healthcare access remains challenging particularly in rural areas, telenursing bridges information gaps by providing accessible, personalized education. As noted by Kementerian Kesehatan RI (2018), health literacy disparities significantly influence disease management outcomes, supporting the need for remote educational interventions.

Attitude transformation: The intervention positively shifted patient attitudes toward self-care. Regular virtual consultations and educational messages helped patients accept the necessity of long- term treatment and lifestyle modifications (Purnamasari & Hindiarti, 2023). Patients became more proactive in managing their conditions and demonstrated increased awareness of complication risks. This attitude change proved particularly important for younger patients who initially displayed more permissive attitudes toward disease management (Snoswell et al., 2020).

Self-care practice enhancement: Telenursing significantly improved actual self-care behaviors including medication adherence, dietary compliance, physical activity, and health monitoring (Irnawati, 2022). Remote monitoring capabilities enabled nurses to track patient progress and provide timely feedback. Medication reminders reduced forgetfulness, while dietary guidance supported healthier food choices. Patients reported feeling more confident in implementing self-care recommendations when receiving ongoing support from healthcare providers (Kruse et al., 2017). Cross-cultural implications: While both countries benefited from telenursing, contextual differences emerged. Indonesian patients faced greater infrastructure challenges including limited internet access in rural areas (Haryanti et al., 2019), yet still derived substantial benefit from asynchronous educational features. Malaysian patients, with more developed digital infrastructure, utilized video consultation features more extensively (Ministry of Health Malaysia, 2020). These findings suggest telenursing adapts effectively to different resource settings, though implementation strategies may require contextual modification.

Comparison with previous studies: The current findings extend previous research by demonstrating telenursing effectiveness specifically for NCD patients in Southeast Asian contexts (Barbosa et al., 2021). The magnitude of effects ($p=0.000$ for all outcomes) exceeds

those reported in some previous studies, potentially due to the comprehensive nature of the "My Nursing" application which integrated education, monitoring, and communication features (Irnawati et al., 2022).

Clinical implications: Telenursing offers a scalable solution to address NCD management challenges in resource-limited settings (World Health Organization, 2021). By reducing the need for frequent clinic visits, telenursing decreases healthcare system burden while improving patient access to ongoing support (Snoswell et al., 2020). The approach particularly benefits working-age patients (31-40 years) who struggle to balance work, family responsibilities, and disease management (Purnamasari & Hindiarti, 2023).

LIMITATION OF THE STUDY

Several limitations warrant consideration. First, the study employed a quasi-experimental design without randomization, potentially introducing selection bias (Creswell & Creswell, 2018). Second, the relatively short intervention duration (eight weeks) precludes assessment of long-term sustainability of improvements (Kruse et al., 2017). Third, the sample was limited to one Indonesian city, limiting generalizability to other regions or Malaysia directly. Fourth, reliance on self-reported measures may introduce social desirability bias (DeVellis, 2017). Fifth, infrastructure challenges in some areas affected application usability for certain participants (Haryanti et al., 2019). Future research should employ randomized controlled designs, extend follow-up periods, and include diverse geographic locations across both countries.

CONCLUSIONS AND SUGGESTIONS

Conclusions

Telenursing delivered through the "My Nursing" application significantly improves knowledge, attitude, and self-care practices among patients with hypertension and diabetes mellitus. The intervention proved effective across different age groups and educational levels, demonstrating versatility for diverse patient populations (Irnawati et al., 2022). Telenursing addresses critical gaps in chronic disease management by providing accessible, ongoing support that enhances patient engagement and self-management capabilities (World Health Organization, 2021). This digital health approach offers a promising strategy for improving NCD outcomes in Indonesia, Malaysia, and similar healthcare contexts.

Suggestions

Future research should investigate long-term outcomes including clinical parameters (blood pressure, blood glucose) and complication rates (Barbosa et al., 2021). Integration of telenursing into existing healthcare systems requires policy support for reimbursement and infrastructure development (World Health Organization, 2023). Healthcare providers need training in digital health delivery to maximize intervention effectiveness (Snoswell et al., 2020). Expansion to other NCD types and underserved populations should be prioritized. Cross-country comparative studies would elucidate contextual factors influencing telenursing effectiveness.

Acknowledgment

The authors thank all participants who contributed to this study. Appreciation is extended to community health centers in Pekalongan City for facilitating participant recruitment and data collection. Technical assistance from Universitas Muhammadiyah Pekajangan

Irnawati., Fety, Y., Haryani, H., & Lastari, R.F. (2026). The Effectiveness of Telenursing "My Nursing" on Self- Care Knowledge, Attitude, and Practice Among Non- Communicable Disease Patients. 2(1) 141-148

Pekalongan and Lincoln University College is gratefully acknowledged.

ETHICAL CONSIDERATIONS

This study received ethical approval from the Institutional Review Board of Universitas Muhammadiyah Pekajangan Pekalongan (Protocol No. 023/IRB-UMPP/2023). All procedures followed the Helsinki Declaration principles. Participants provided written informed consent after receiving comprehensive information about study purposes, procedures, risks, and benefits. Confidentiality was maintained through data anonymization. Participants could withdraw without consequence.

Funding Statement

This research was supported by internal funding from Universitas Muhammadiyah Pekajangan Pekalongan (Grant No. 023/Penelitian Internal/UMPP/2023) and external collaboration support from Lincoln University College, Malaysia. The funders had no role in study design, data collection, analysis, interpretation, or manuscript preparation.

Conflict of Interest Statement

The authors declare no competing interests. The "My Nursing" application was developed for research purposes without commercial affiliations. No financial relationships exist with organizations that could influence the submitted work. All authors have disclosed any potential conflicts of interest and confirm independence from funders.

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