The Effect of Evidence-Based Nursing Practice on Medication Adherence in Community-Dwelling Patients with Chronic Diseases and Polypharmacy

Authors: Wan Xiaomin, Wan Xiaomin

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Abstract

Objective: To investigate the effect of evidence-based nursing on medication adherence among community-dwelling chronic disease patients with polypharmacy. Methods: Sixty chronic disease patients with polypharmacy under management at our center from January 2023 to June 2023 were selected and divided into control and observation groups based on before and after the application of evidence-based nursing, with 30 cases in each group. The control group received conventional nursing care, while the observation group received an evidence-based nursing protocol. Comparisons were made regarding the audit indicator implementation rate before and after evidence application, medication adherence and medication possession ratio of patients in both groups, and community nurses' knowledge level of chronic disease medications. Results: The audit indicator implementation rate was higher after evidence application; medication adherence and medication possession ratio of patients in the observation group were higher than those in the control group; and community nurses' knowledge level of chronic disease medications was significantly improved after evidence application. All differences were statistically significant ($P<0.05$). Conclusion: Evidence-based nursing practice can standardize the management of medication adherence among community chronic disease patients with polypharmacy, improve medication adherence in chronic disease patients with polypharmacy, and enhance community nurses' knowledge level of chronic disease medications.

Full Text

Impact of Evidence-Based Nursing Practice on Medication Adherence Among Community-Dwelling Patients with Chronic Diseases and Polypharmacy

Xiao-min Wan
1. Community Health Services Center of Dongguan Nancheng, Dongguan, Guangdong, China, 523411

Abstract

Objective: To explore the effect of evidence-based nursing on medication adherence among community-dwelling patients with chronic diseases and polypharmacy.
Methods: Sixty patients with chronic diseases under management at our center from January 2023 to June 2023 were selected and divided into control and observation groups (30 cases each) based on whether they received evidence-based nursing care. The control group received conventional nursing, while the observation group received evidence-based nursing. We compared the implementation rate of review indicators before and after evidence application, medication adherence, medication possession rate, and community nurses' knowledge of chronic disease medications between the two groups.
Results: After evidence application, the implementation rate of review indicators was higher, and both medication adherence and medication possession rate in the observation group exceeded those of the control group. Community nurses' knowledge of chronic disease medications improved significantly after evidence application, with statistically significant differences ($P<0.05$).
Conclusion: Evidence-based nursing practice can standardize medication adherence management for community-dwelling patients with chronic diseases and polypharmacy, improve their medication adherence, and enhance community nurses' knowledge of chronic disease medications.

Keywords: evidence-based nursing; medication adherence; polypharmacy; chronic disease management; community

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Introduction

The WHO defines polypharmacy as the simultaneous use of five or more medications daily, including over-the-counter drugs, prescription medications, herbal medicines, and dietary supplements [1]. By the end of 2020, the number of people with chronic diseases in China had reached approximately 300 million, with these patients concentrated primarily in community settings. About 40% of patients with chronic diseases have polypharmacy (taking $ $5 medications) [2]. Medication adherence refers to the degree of voluntary cooperation with

medication instructions or prescriptions [3]. Studies show that medication adherence among patients with chronic diseases and polypharmacy is only 37.5% [4]. Medication adherence management for community-dwelling patients with polypharmacy in China is characterized by fragmentation and low execution, lacking comprehensive and scientific management protocols to improve adherence [5]. This project employed evidence-based nursing methods to integrate best evidence with community patients' preferences, aiming to provide a reference for community nurses to develop management protocols that improve medication adherence among patients with chronic diseases and polypharmacy.

1. Methods

1.1 Study Subjects Sixty community-dwelling patients with chronic diseases and polypharmacy under management at our center from January 2023 to June 2023 were selected as study subjects.

Inclusion criteria: Permanent residents of the jurisdiction; $ $2 chronic diseases; $ $5 routine medications; Clear consciousness without communication barriers; Voluntary participation with informed consent.

Exclusion criteria: Patients with severe complications or comorbidities in terminal stages of disease; Patients unable to care for themselves (Barthel score $ $40) or bedridden long-term.

Withdrawal criteria: (1) Unwillingness to continue participation; (2) Disease progression preventing continued participation.

1.2 Methods The study followed the JBI evidence-based practice model, comprising three stages: baseline review before evidence application, clinical application of evidence, and post-application review.

1.2.1 Baseline Review Before Evidence Application 1.2.1.1 Formulating the Evidence-Based Question: The evidence-based question was determined using the PIPOST model [6]. **P-Population:** Community-dwelling patients with chronic diseases and polypharmacy; **I-Intervention:** Medication safety assessment, collaborative medication planning, health education, follow-up, etc.; **P-Professional:** Community nurses; **O-Outcome:** Medication adherence, chronic disease control achievement, and complication incidence; **S-Setting:** A community health service center; **T-Type of evidence:** Clinical practice guidelines, expert consensus, systematic reviews, etc.

1.2.2.2 Evidence Retrieval: This study implemented evidence-based nursing protocols based on the "Best Evidence Summary for Improving Medication Adherence in Community-Dwelling Patients with Chronic Diseases and Polypharmacy" published in *Military Nursing* in 2022 [7]. The research team consisted of six clinical nursing backbone members with evidence-based nursing backgrounds. Using the "6S Pyramid" model, we searched domestic and international guideline websites, electronic databases, and relevant professional

association websites, with a search cutoff date of November 2021. Guidelines were evaluated using the Appraisal of Guidelines for Research and Evaluation II (AGREE) [8]. Systematic reviews were assessed using the Assessment of Multiple Systematic Reviews (AMSTAR) tool from the Joanna Briggs Institute (JBI) [9]. Expert opinions and consensus were evaluated using appropriate tools. A total of eight documents were included: two guidelines [10, 11], one expert consensus [12], and five systematic reviews [13-17].

1.2.2.3 Development of Review Indicators: Based on the FAME structure (Feasibility, Appropriateness, Meaningfulness, and Effectiveness of evidence) [18], ten clinical review standards were developed, as detailed in .

** Review Indicators**

Indicator Category	Specific Indicators
Establish multidisciplinary system	1. Develop medication management process for community patients with polypharmacy2. Community nurses receive knowledge training and assessment
Assess adherence	3. Nurses conduct and record medication adherence assessment for first-visit patients with polypharmacy, including: patient background and general physical condition; problem assessment and questionnaire ABC evaluation; medication readiness assessment; adherence behavior assessment
Simplify medication regimen	4. Community has medication prescribing principles: assess medication regimen; simplify regimen when possible; synchronize medication timing; provide medication cards

Indicator Category	Specific Indicators
Develop adherence intervention plan	5. Patients, doctors, pharmacists, and nurses collaboratively develop medication plans, encouraging family participation and supervision6. Develop personalized medication behavior intervention plans based on individual differences and patient preferences7. Recommend mobile phone medication reminders8. Conduct regular community medication education in small groups, providing health education flyers and brochures9. Set up follow-up registration at nursing station for phone or on-site recording of medication adherence10. Distribute medication record books for patients to track their medication use

1.2.1.4 Conducting Baseline Review: (1) Baseline review period: From January 2023 to March 2023, baseline review was conducted on 30 community patients with polypharmacy and 15 community nurses. The review tool was a self-developed checklist, with "yes" marking compliance and "no" marking non-compliance. Implementation rate = (number of compliant cases / total cases) × 100%. (2) Patient medication adherence and medication possession rate: Medication adherence scale: The Morisky-8 Medication Adherence Questionnaire [19] was used. For questions 1-7, "no" scored 1 point and "yes" scored 0 (question 5 reversed); question 8 scored 1.0, 0.75, 0.50, 0.25, and 0 for "never," "occasionally," "sometimes," "often," and "all the time," respectively. Scores of 8 indicated high adherence, $ $6 indicated low adherence, and 6-7 indicated moderate adherence. Medication Possession Ratio (MPR) [20]: The percentage of medication actually taken relative to medication prescribed during a 14-day treatment period (calculated by pill count). MPR $ $80% indicated good adherence, while MPR <80% indicated poor adherence. (3) Community nurses' knowledge of chronic disease medications: Fifteen community nurses were assessed on chronic disease medication knowledge using 40 randomly selected questions from a medication knowledge bank. Correct answers scored "1" and incorrect answers scored "0." A score rate $ $80% was considered passing.

1.2.2 Clinical Application of Evidence 1.2.2.1 Establishing the Evidence Application Project Team: The project team comprised seven members with $ $5 years of experience in community healthcare. Education: one master' s degree and six bachelor' s degrees. Professional titles: one senior, two intermediate, and four junior. Roles: one evidence-based nurse for project

guidance; one community head nurse for coordination; two community nurses for patient follow-up, data collection, and aggregation; one physician for diagnosis, prescription, and medication adjustment; one pharmacist for medication guidance and staff training; and one public health doctor for data processing and analysis.

1.2.2.2 Developing Management Process for Patients with Chronic Diseases and Polypharmacy: (1) Assessment: Nurses evaluated patient medication adherence through the community health platform based on medication refill frequency and follow-up history; (2) Planning: Physicians, nurses, and patients (and/or primary caregivers) collaboratively developed medication plans; (3) Implementation: Standardized self-management health education materials were created for personalized one-on-one medication education for patients and families; (4) Monthly/quarterly follow-up tracked medication adherence, conducted physical examinations, and reviewed laboratory reports.

1.2.3 Post-Application Review Using the same method as baseline review, post-application review was conducted from April 2023 to June 2023 on 30 community patients with polypharmacy and 15 community nurses. The 30 patients enrolled from January to March 2023 (before evidence application) served as the control group, while the 30 patients enrolled from April to June 2023 (evidence-based practice group) served as the observation group. The observation group included 17 males and 13 females with mean age $(61.56\$\pm4.18) years; the control group included 16 males and 14 females with mean age (61.38\pm\$4.80)$ years. No statistically significant differences were found between groups in gender, age, education level, marital status, health status, or number of medication types ($P>0.05$).

1.2.4 Statistical Methods SPSS 25.0 was used for statistical analysis. Categorical data were described using frequency and percentage, with between-group comparisons using ^{2} test. Measurement data were normally distributed and expressed as mean±standard deviation, with between-group comparisons using t-test. The significance level was set at α=0.05.

2. Results

2.1 Review Indicator Implementation Rate The implementation rate of review indicators was higher after evidence application than before, as detailed in .

** Comparison of Review Indicator Implementation Rates Before and After Evidence Application**

Indicator	Pre-Implementation Rate (%)	Post-Implementation Rate (%)
1. Medication management process for community patients with polypharmacy		
2. Healthcare staff receiving knowledge training and assessment		
3. Nurses conducting and recording medication adherence assessment for first-visit patients with polypharmacy		
4. Community medication prescribing principles		

Indicator	Pre-Implementation Rate (%)	Post-Implementation Rate (%)
5. Collaborative medication planning among patients, doctors, pharmacists, and nurses with family participation		
6. Medication behavior intervention plans		
7. Recommendation of mobile phone medication reminders		
8. Regular community medication education in small groups with educational materials		
9. Follow-up registration at nursing station via phone or on-site recording		

Indicator	Pre-Implementation Rate (%)	Post-Implementation Rate (%)
10. Distribution of medication record books		

2.2 Patient Medication Adherence Scores and Medication Possession Rate After evidence application, both medication adherence scores and medication possession rates in the observation group were significantly higher than in the control group (P<0.05), as shown in .

** Comparison of Medication Adherence and Possession Rates**

Group | Medication Adherence (score) | Medication Possession Rate $ $80% (cases) |

|—-|————|————————| | Control | 6.02$±1.47|||*Observation*|7.02±$0.83 | |

2.3 Community Nurses' Knowledge of Chronic Disease Medications After evidence application, both scores and pass rates of community nurses' knowledge of chronic disease medications improved significantly (P<0.05), as shown in .

** Comparison of Community Nurses' Medication Knowledge Scores and Pass Rates**

Time Point	Score	Pass Rate (%)
Pre-implementation	28.00$±7.01|||*Post−implementation*|33.13±$3.378		

3. Discussion

3.1 Evidence-Based Nursing Practice Standardized Medication Management Processes Standardized management processes help clarify workflows, define staff responsibilities, and improve efficiency and quality. Through this evidence-based nursing practice, we identified barriers to implementation and developed corresponding strategies to form a management process. Baseline review revealed inadequate management of medication adherence among community patients with chronic diseases and polypharmacy. Based on the evidence, we developed corresponding processes from four aspects—assessment, planning, implementation, and follow-up—to standardize medication management.

3.2 Evidence-Based Nursing Practice Improved Medication Adherence With the increasing incidence of chronic diseases, secondary prevention is particularly important. Regular medication is one of the key measures to improve prognosis [21]. Evidence-based practice summarizes existing medical decisions regarding medication adherence and provides evidence grades. This study compared current medical decisions with the best available evidence, identified decision gaps, and improved medical measures. During implementation, we found that teamwork among healthcare members and personalized medication health education for patients were crucial. By addressing individual patient needs, we guided patients to adopt a scientific attitude toward medication therapy, helped them recognize the importance of regular medication, and fostered good medication habits, thereby improving adherence from multiple perspectives.

3.3 Evidence-Based Nursing Practice Enhanced Community Nurses' Medication Knowledge Community patients with chronic diseases and polypharmacy have complex conditions, and the pharmacological mechanisms of their medications are relatively complicated. Community nurses' mastery of drug indications and pharmacological properties directly affects treatment outcomes [22]. This study showed that community nurses' knowledge of chronic disease medications improved significantly after evidence-based practice ($P<0.05$), possibly because the evidence-based team conducted various medication safety training sessions that stimulated nurses' enthusiasm for active learning and deepened their understanding of commonly used medications. This suggests that nursing managers can use evidence-based nursing practice to conduct targeted medication knowledge training for community nurses, enhancing their persuasiveness in guiding patients to follow medical advice.

4. Limitations and Future Directions

This project had a short implementation period, and long-term patient outcomes remain unknown. Future research will conduct long-term follow-up to compare acute exacerbation rates, complication rates, annual hospitalization frequency, and mortality with historical data, to clarify the impact of evidence-based practice on long-term prognosis for community patients with chronic diseases and polypharmacy.

References

[1] Cheng T, Tu H, Guo T, et al. Best evidence summary for medication management in elderly patients with polypharmacy[J]. Chinese Journal of Nursing Education, 2023,20(02):217-222.
[2] Wu L. Major chronic disease health management and new opportunities for commercial insurance development[J]. Shanghai Insurance, 2023(01):8-9.
[3] Graffigna G, Barello S, Bonanomi A, et al. Measuring patient engagement: development and psychometric properties of the Patient Health Engagement

(PHE) Scale[J]. Front Psychol, 2015,6:274.
[4] Xie X, Gao J, Bai D, et al. Meta-analysis of medication adherence status and influencing factors among elderly with polypharmacy[J]. Chinese General Practice, 2023,26(35):4394-4403.
[5] Wang J. Study on medication adherence of community patients with multimorbidity and application of self-management groups in their management[D]. Guangzhou Medical University, 2018.
[6] Zhu Z, Hu Y, Zhou Y, et al. Promoting evidence translation to clinical practice (III): research topic selection and question formulation[J]. Journal of Nurses Training, 2020,35(09):796-799.
[7] Zhou T, Mao J, Xie L, et al. Best evidence summary for improving medication adherence in community patients with chronic diseases and polypharmacy[J]. Military Nursing, 2022,39(09):85-89.
[8] Zhou F, Hao Y, Cong X, et al. AGREE II tool and supplementary interpretation of domain scores[J]. Journal of Nursing, 2018,25(18):56-58.
[9] Zhu Z, Hu Y, Zhou Y, et al. Promoting evidence translation to clinical practice (V): literature quality evaluation in evidence clinical transformation research[J]. Journal of Nurses Training, 2020,35(11):996-1000.
[10] Cooney D, Pascuzzi K. Polypharmacy in the elderly: focus on drug interactions and adherence in hypertension[J]. Clin Geriatr Med, 2009,25(2):221-233.
[11] Marcum Z A, Gellad W F. Medication adherence to multidrug regimens[J]. Clin Geriatr Med, 2012,28(2):287-300.
[12] National Key R&D Project YFC Research Group. Expert consensus on safety management of polypharmacy in elderly patients with multimorbidity[J]. Chinese Journal of Health Care and Medicine, 2021,23(05):548-554.
[13] Zelko E, Klemenc-Ketis Z, Tusek-Bunc K. MEDICATION ADHERENCE IN ELDERLY WITH POLYPHARMACY LIVING AT HOME: A SYSTEMATIC REVIEW OF EXISTING STUDIES[J]. Mater Sociomed, 2016,28(2):129-132.
[14] Williams A, Manias E, Walker R. Interventions to improve medication adherence in people with multiple chronic conditions: a systematic review[J]. J Adv Nurs, 2008,63(2):132-143.
[15] Tan J P, Cheng K, Siah R C. A systematic review and meta-analysis on the effectiveness of education on medication adherence for patients with hypertension, hyperlipidaemia and diabetes[J]. J Adv Nurs, 2019,75(11):2478-2494.
[16] Santo K, Kirkendall S, Laba T L, et al. Interventions to improve medication adherence in coronary disease patients: A systematic review and meta-analysis of randomised controlled trials[J]. Eur J Prev Cardiol, 2016,23(10):1065-1076.
[17] Patton D E, Hughes C M, Cadogan C A, et al. Theory-Based Interventions to Improve Medication Adherence in Older Adults Prescribed Polypharmacy: A Systematic Review[J]. Drugs Aging, 2017,34(2):97-113.
[18] Wei D, Long C, Wu S, et al. Evidence-based nursing practice for early exercise rehabilitation in acute myocardial infarction patients[J]. Journal of Nursing, 2023,30(11):53-58.
[19] Xu W, Wang Q, Liang W. Reliability and validity evaluation of Morisky questionnaire for measuring medication adherence in hypertensive patients[J].

Chinese Journal of Prevention and Control of Chronic Diseases, 2007(05):424-426.
[20] Xie T, Shi R. Efficacy analysis of vonoprazan in patients with initial Helicobacter pylori infection[J]. Journal of Naval Medical University, 2023,44(06):691-696.
[21] Ma J. Evaluation of nursing effect and treatment compliance in patients with hypertension and coronary heart disease[J]. Clinical Research and Practice, 2017,2(33):167-168.
[22] Li Y. Application of drug management team in medication knowledge of cardiology nurses[J]. Continuing Medical Education, 2021,35(12):1-3.

Note: Figure translations are in progress. See original paper for figures.