

Evaluating the Effectiveness of a Nursing Technician-Led Patient Education Program on Improving Medication Adherence and Reducing Adverse Drug Events among Elderly Patients in Hafr Al-Batin: A Qualitative Study

Saad Dhafer Aldhafeeri¹, Nawaf Sayer Abdurhman Aljohani¹, Hamed Break Hamdan Aljameeli¹, Abdullah Sulaiman Rashed Alharbi¹, Mubarak Saad Alsuhal¹, Mohammed Abdullah Mafady Alenzi²

1. Nursing Technician, Ministry of Health Branch in Hafar Al-Batin, Saudi Arabia
2. Health Assistant, Public Health Department, MOH Branch, Hafr Al-Batin, Saudi Arabia

ABSTRACT

Purpose: This qualitative study aimed to evaluate the effectiveness of a nursing technician-led patient education program on improving medication adherence and reducing adverse drug events among elderly patients in Hafr Al-Batin, Saudi Arabia.

Methods: A qualitative descriptive design was employed. Purposive sampling was used to recruit 20 nursing technicians and 30 elderly patients who participated in the education program across 5 primary healthcare centers. Data were collected through semi-structured interviews exploring experiences and perceptions of the program's impact. Interviews were audio-recorded, transcribed verbatim, and analyzed using thematic analysis. Trustworthiness was ensured through member checking, peer debriefing, and reflexive journaling.

Results: Four main themes emerged: (1) Enhanced patient knowledge and understanding of medications, with participants noting the clarity and practicality of the education provided; (2) Improved medication adherence, as patients reported increased motivation and strategies to take medications as prescribed; (3) Reduced adverse drug events, with patients and nursing technicians describing fewer medication errors and side effects; and (4) Empowerment of nursing technicians, who felt more confident and valued in their patient education roles.

Conclusions: A nursing technician-led patient education program can effectively improve medication adherence and safety among elderly patients in primary care settings. The program empowers nursing technicians to play a key role in patient education. These findings support the expansion of such programs to optimize medication use and outcomes in geriatric care.

KEYWORDS: patient education, nursing technicians, medication adherence, adverse drug events, elderly, qualitative research.

1. Introduction

Medication non-adherence and adverse drug events (ADEs) are significant public health problems, particularly among elderly patients with multiple chronic conditions and complex medication regimens (World Health Organization [WHO], 2003). In Saudi Arabia, studies have reported medication non-adherence rates ranging from 35-65% among elderly patients, contributing to poor health outcomes and increased healthcare costs (Alqarni et al., 2019; Alsulami et al., 2020).

Patient education is a key strategy to improve medication adherence and safety (Abubakar et al., 2020). While physicians and pharmacists traditionally provide medication education, nursing professionals, including nursing technicians, are increasingly recognized as vital members of the patient education team (Dickens et al., 2017). Nursing technicians, also known as licensed practical nurses or nursing assistants, work under the supervision of registered nurses and provide direct patient care, including medication administration and monitoring (Alotaibi, 2017).

Given their frontline roles and close relationships with patients, nursing technicians are well-positioned to provide practical, patient-centered medication education (Dickens et al., 2017). However, there is limited research on the effectiveness of nursing technician-led patient education programs, especially in the Saudi Arabian context. Most studies have focused on registered nurses or pharmacists as educators (Abubakar et al., 2020; Alsulami et al., 2020).

To address this gap, a nursing technician-led patient education program was implemented in primary healthcare centers in Hafr Al-Batin, Saudi Arabia, to improve medication adherence and reduce ADEs among elderly patients. The program involved nursing technicians providing structured, individualized education sessions on medication use, side effects, and self-management strategies. This qualitative study aimed to evaluate the effectiveness of this program from the perspectives of nursing technicians and elderly patients.

Understanding the experiences and perceptions of nursing technicians and patients regarding the impact of this program can provide valuable insights to guide the development and implementation of patient education interventions in geriatric care. Qualitative methods are particularly useful for exploring the complex factors influencing medication adherence and the subjective experiences of patient education (Craig et al., 2013).

Therefore, the purpose of this qualitative study was to evaluate the effectiveness of a nursing technician-led patient education program on improving medication adherence and reducing adverse drug events among elderly patients in Hafr Al-Batin, Saudi Arabia. The findings can inform strategies to optimize the role of nursing technicians in patient education and medication safety in primary care settings.

2. Literature Review

A comprehensive literature search was conducted in PubMed, CINAHL, and Scopus databases using the following keywords: patient education, nursing technicians,

medication adherence, adverse drug events, elderly, and qualitative research. The search was limited to English-language, peer-reviewed articles published between 2010-2022. Additional relevant articles were identified through hand-searching reference lists.

Medication Non-Adherence and Adverse Drug Events in Elderly Patients

Medication non-adherence, defined as the extent to which a patient's medication-taking behavior does not correspond with agreed recommendations from a healthcare provider, is a prevalent issue among elderly patients (WHO, 2003). A systematic review by Gellad et al. (2011) found that medication non-adherence rates ranged from 40-60% among community-dwelling older adults. Factors contributing to non-adherence in this population include polypharmacy, cognitive impairment, physical limitations, side effects, and lack of medication knowledge (Yap et al., 2016).

Non-adherence to prescribed medications can lead to poor disease control, increased hospitalizations, and higher mortality rates in elderly patients (Doggrell, 2010). A meta-analysis by DiMatteo et al. (2002) found that patients with chronic diseases who were non-adherent to medications had a 2.5 times greater risk of hospitalization compared to adherent patients.

Adverse drug events, defined as any injury resulting from medication use, are another major concern in geriatric care (WHO, 2019). Elderly patients are at higher risk for ADEs due to age-related changes in pharmacokinetics and pharmacodynamics, polypharmacy, and comorbidities (Nabovati et al., 2017). A systematic review by Alhawassi et al. (2014) estimated that 16.6% of hospitalizations among elderly patients were related to ADEs.

In Saudi Arabia, several studies have highlighted the prevalence of medication non-adherence and ADEs among older adults. Alqarni et al. (2019) surveyed 300 elderly patients in Riyadh and found a non-adherence rate of 52.7%, with forgetfulness and side effects being the main reasons. Alsulami et al. (2020) conducted a retrospective analysis of ADEs reported in a tertiary care hospital in Jeddah and found that 60% of ADEs occurred in patients aged 60 years and above.

These findings underscore the need for effective interventions to improve medication adherence and safety in elderly patients. Patient education has been identified as a key strategy to address these issues (Abubakar et al., 2020).

Patient Education to Improve Medication Adherence and Safety

Patient education involves providing information, support, and skills training to enable patients to manage their health conditions and medications effectively (WHO, 2016). A systematic review by Conn et al. (2009) found that patient education interventions significantly improved medication adherence across various chronic diseases, with an average effect size of 0.48.

Several studies have specifically examined the impact of patient education on medication adherence and safety in elderly populations. Schlenk et al. (2008) evaluated a nurse-led medication education program for older adults with heart failure and found significant improvements in medication adherence and self-efficacy. Tsai et al. (2018) reported that a pharmacist-led education program reduced

medication discrepancies and potential ADEs among elderly patients discharged from the hospital.

While these studies support the effectiveness of patient education, they primarily focused on registered nurses or pharmacists as educators. There is limited research on the role of nursing technicians in providing medication education to elderly patients.

Nursing Technicians as Patient Educators

Nursing technicians are essential members of the healthcare team who provide direct patient care under the supervision of registered nurses (Alotaibi, 2017). In Saudi Arabia, nursing technicians complete a 2-3 year diploma program and are licensed by the Saudi Commission for Health Specialties (Alboliteeh et al., 2015).

Given their frontline roles and frequent interactions with patients, nursing technicians are well-positioned to provide patient education (Dickens et al., 2017). A qualitative study by Mulder et al. (2014) found that nursing assistants in long-term care facilities played a vital role in observing and reporting medication side effects in elderly residents.

However, research on the effectiveness of nursing technician-led patient education is scarce. A quasi-experimental study by Awan et al. (2017) evaluated a medication adherence education program delivered by licensed practical nurses to patients with hypertension in Pakistan. The study found significant improvements in medication adherence and blood pressure control in the intervention group compared to the control group.

These findings suggest that nursing technicians can effectively provide patient education, but more research is needed to examine their specific role in educating elderly patients about medication adherence and safety. Furthermore, no studies were found that explored this topic in the Saudi Arabian context.

Gaps in the Literature

The literature review reveals several gaps that warrant further investigation. First, while patient education has been shown to improve medication adherence and safety, there is limited research on the effectiveness of nursing technician-led education programs, especially for elderly patients. Second, most studies have used quantitative methods to evaluate patient education interventions, with few qualitative studies exploring the experiences and perceptions of nursing technicians and patients. Finally, no studies were found that specifically examined nursing technician-led patient education in the Saudi Arabian healthcare system.

This qualitative study aims to address these gaps by evaluating the effectiveness of a nursing technician-led patient education program on improving medication adherence and reducing adverse drug events among elderly patients in Hafr Al-Batin, Saudi Arabia. Understanding the perspectives of nursing technicians and patients can provide valuable insights to guide the development and implementation of patient education interventions in geriatric care.

3. Methods

Design

A qualitative descriptive design was used to explore the experiences and perceptions of nursing technicians and elderly patients regarding the effectiveness of the patient education program. Qualitative description is a pragmatic approach that stays close to the data and produces straightforward summaries of participants' views, making it well-suited for evaluating health care interventions (Sandelowski, 2000).

Setting and Participants

The study was conducted across five primary healthcare centers in Hafr Al-Batin that had implemented the nursing technician-led patient education program for at least six months. Purposive sampling was used to recruit 20 nursing technicians and 30 elderly patients (aged ≥ 60 years) who had participated in the program. Sampling continued until data saturation was reached, as determined by no new themes emerging from the interviews (Mason, 2010).

Inclusion criteria for nursing technicians were: (a) licensed nursing technician, (b) employed at a participating health center for at least one year, (c) completed training on the patient education program, and (d) provided education sessions to elderly patients for at least three months. Inclusion criteria for elderly patients were: (a) aged 60 years or older, (b) diagnosed with at least one chronic condition requiring daily medications, (c) attended at least two education sessions with a nursing technician, and (d) able to communicate in Arabic.

Patient Education Program

The nursing technician-led patient education program was developed based on best practices for medication adherence interventions (Abubakar et al., 2020). The program consisted of three 30-minute individual education sessions delivered by nursing technicians to elderly patients over a period of six weeks.

The sessions covered the following topics: (1) understanding prescribed medications, including indications, dosing, and potential side effects; (2) strategies for remembering to take medications, such as using pill boxes or setting reminders; (3) recognizing and managing common side effects; and (4) communicating with healthcare providers about medication concerns.

Nursing technicians used a standardized education checklist and provided patients with written materials and medication schedules. They also conducted follow-up phone calls between sessions to reinforce education and address any issues. The program was implemented as part of routine care at the participating health centers.

Data Collection

Semi-structured individual interviews were conducted with nursing technicians and elderly patients. Interview guides were developed based on the literature review and input from the research team. Questions explored participants' experiences with the education program, perceived impact on medication adherence and adverse drug events, facilitators and barriers to program effectiveness, and suggestions for improvement.

Interviews were conducted in Arabic by trained research assistants in private rooms at the healthcare centers. Interviews lasted 30-60 minutes, were audio-recorded, and transcribed verbatim. Field notes capturing non-verbal cues and reflexive memos were written after each interview.

Data Analysis

Interview transcripts were analyzed using thematic analysis, a method for identifying, analyzing, and reporting patterns or themes within qualitative data (Braun & Clarke, 2006). The analysis followed these steps:

1. Familiarization with the data: Transcripts were read and re-read to become immersed in the data.
2. Generating initial codes: Interesting features of the data were coded systematically across the entire dataset.
3. Searching for themes: Codes were collated into potential themes, gathering all relevant data for each theme.
4. Reviewing themes: Themes were checked for coherence with coded extracts and the entire dataset.
5. Defining and naming themes: The specifics of each theme were refined and clear definitions and names generated.
6. Producing the report: Compelling examples were selected to illustrate themes and relate back to the research question.

Coding was done inductively, without trying to fit data into a pre-existing coding frame. Two researchers independently coded transcripts and then met to compare codes and agree on final themes. Disagreements were resolved through discussion and consensus. NVivo 12 software was used to facilitate data management and organization.

Trustworthiness

Several strategies were used to ensure the trustworthiness of the findings (Lincoln & Guba, 1985). Credibility was enhanced through member checking, where preliminary findings were shared with a subset of participants for feedback. Dependability was addressed through a detailed audit trail documenting all research decisions. Confirmability was maintained through reflexive journaling to bracket researcher assumptions. Transferability was facilitated through thick descriptions of the study context and participants.

4. Results

Participant Characteristics

The final sample included 20 nursing technicians and 30 elderly patients. Nursing technicians had a mean age of 32.4 years (SD = 6.2) and an average of 6.8 years (SD = 4.1) of experience. Most were female (n = 14, 70%) and Saudi nationals (n = 17,

85%). Elderly patients had a mean age of 68.5 years (SD = 5.7) and were equally split between males and females. The majority had multiple chronic conditions (n = 24, 80%), with hypertension, diabetes, and cardiovascular disease being the most common. Table 1 presents the demographic characteristics of the participants.

Table 1 Demographic Characteristics of Nursing Technicians and Elderly Patients

Characteristic	Nursing Technicians (n = 20)	Elderly Patients (n = 30)
Age, mean (SD)	32.4 (6.2)	68.5 (5.7)
Gender, n (%)		
Male	6 (30%)	15 (50%)
Female	14 (70%)	15 (50%)
Nationality, n (%)		
Saudi	17 (85%)	28 (93.3%)
Non-Saudi	3 (15%)	2 (6.7%)
Years of experience, mean (SD)	6.8 (4.1)	-
Number of chronic conditions, n (%)		
1	-	6 (20%)
2-3	-	16 (53.3%)
>3	-	8 (26.7%)
Note. SD = standard deviation.		

Note. SD = standard deviation.

Themes

Four main themes emerged from the data analysis:

1. Enhanced patient knowledge and understanding of medications

Nursing technicians and patients described how the education program improved patients' knowledge and understanding of their prescribed medications. Nursing technicians noted that the structured sessions allowed them to provide clear explanations of medication indications, dosing, and side effects. They used simple language and visual aids to facilitate understanding.

"I used the teach-back method to make sure patients understood how to take their medications correctly. I would ask them to repeat back the instructions in their own words." (Nursing Technician 7)

Patients appreciated the clear and practical information provided by the nursing technicians. Many reported feeling more informed about their medications and the importance of taking them as prescribed.

"Before, I didn't really understand why I was taking so many pills. But the nurse explained each one and how it helps my condition. Now I know why it's important to take them every day." (Patient 21)

2. Improved medication adherence

Both nursing technicians and patients observed improvements in medication adherence following the education program. Nursing technicians described patients being more engaged in their medication management and using strategies learned in the sessions, such as pill boxes and reminders.

"One patient started using a pill organizer after our session on remembering to take

medications. She said it made it much easier to keep track of her pills." (Nursing Technician 15)

Patients reported increased motivation to take their medications as prescribed, citing a better understanding of the benefits and risks. Some noticed positive changes in their health, such as improved blood pressure or glucose control, which reinforced their adherence.

"I used to skip doses sometimes because I didn't like the side effects. But after learning how to manage them from the nurse, I'm better at taking my medications every day. And my blood pressure has been much better controlled." (Patient 8)

3. Reduced adverse drug events

Nursing technicians and patients described fewer instances of medication errors and adverse drug events following the education program. Nursing technicians felt better equipped to identify and manage potential medication issues, such as drug interactions or side effects.

"I had a patient who was experiencing dizziness from her blood pressure medication. During our session, I was able to teach her how to monitor her symptoms and when to contact the doctor. We were able to adjust her dose and the dizziness improved." (Nursing Technician 11)

Patients reported increased confidence in recognizing and handling medication side effects. Many appreciated learning practical strategies, such as taking medications with food or at bedtime, to minimize adverse effects.

"I used to get a lot of stomach upset from my arthritis medication. The nurse suggested taking it with meals and that has made a big difference. I don't dread taking it anymore." (Patient 18)

4. Empowerment of nursing technicians

Nursing technicians described feeling empowered in their roles as patient educators. Many expressed increased job satisfaction and confidence in their ability to positively impact patient care.

"Providing the medication education sessions has been a highlight of my job. I feel like I'm really making a difference in patients' lives by helping them better manage their health." (Nursing technician 3)

Nursing technicians valued the additional training and support provided by the program. They felt it enhanced their communication and education skills, as well as their knowledge of medications.

"The training on the teach-back method and motivational interviewing has been so helpful. I feel more prepared to have productive conversations with patients about their medications." (Nursing technician 9)

Patients also expressed appreciation for the dedication and expertise of the nursing technicians. Many viewed them as valuable resources and partners in their care.

"I'm grateful for the time and attention the nurse gave me. I felt like she really cared

about helping me succeed with my medications. It's nice to know I have someone I can go to with questions." (Patient 25)

These themes highlight the positive impact of the nursing technician-led patient education program on medication adherence and safety in elderly patients. The program empowered nursing technicians to take on expanded roles in patient education, leading to enhanced patient knowledge, self-management skills, and health outcomes.

5. Discussion

This qualitative study evaluated the effectiveness of a nursing technician-led patient education program on improving medication adherence and reducing adverse drug events among elderly patients in Hafr Al-Batin, Saudi Arabia. The findings suggest that the program had a positive impact on patient knowledge, medication-taking behaviors, and adverse event recognition and management.

The first theme, enhanced patient knowledge and understanding of medications, aligns with previous research emphasizing the importance of clear, practical patient education. A systematic review by Shcherbakova et al. (2016) found that effective medication adherence interventions included simple, tailored information about drug indications, dosing, and side effects. The nursing technicians in this study used plain language, visual aids, and teach-back techniques to ensure patient comprehension, which are recommended best practices (Abubakar et al., 2020).

The second theme, improved medication adherence, supports the role of patient education in promoting medication-taking behaviors. Prior studies have shown that educational interventions can significantly improve adherence in elderly patients with chronic conditions (Conn et al., 2009). The nursing technicians in this program provided patients with practical strategies and tools, such as pill organizers and reminders, which have been associated with better adherence (Yap et al., 2016).

The third theme, reduced adverse drug events, highlights the potential for patient education to enhance medication safety. Previous research has found that educating patients on medication side effects and self-management can reduce the incidence and severity of ADEs (Schnipper et al., 2017). The nursing technicians in this study taught patients how to recognize and respond to potential medication issues, which may have prevented some ADEs.

The fourth theme, empowerment of nursing technicians, underscores the value of engaging these frontline providers in patient education. Prior qualitative studies have found that nursing assistants and technicians often feel underutilized and desire more involvement in patient care (Mulder et al., 2014). This program provided nursing technicians with additional training and opportunities to make a meaningful difference in patients' lives, leading to increased job satisfaction and confidence.

The findings of this study add to the limited literature on nursing technician-led patient education interventions. While most prior research has focused on registered nurses or pharmacists as educators (Abubakar et al., 2020), this study suggests that nursing technicians can also effectively provide medication education to elderly

patients. This is particularly relevant in resource-limited settings, where nursing technicians may be more available than other providers.

Furthermore, this study addresses a gap in the literature by qualitatively exploring the experiences and perceptions of nursing technicians and patients regarding a medication adherence intervention. The themes that emerged provide rich insight into the mechanisms by which the program improved adherence and safety, as well as the impact on nursing technicians' roles and job satisfaction. These findings can inform the design and implementation of similar interventions in other settings.

6. Limitations

This study has several limitations. First, as a qualitative study conducted in a specific context, the findings may not be generalizable to other populations or settings. However, the thick descriptions provided may allow readers to assess the transferability of the findings to their own contexts.

Second, the study relied on self-reported data from interviews, which may be subject to social desirability bias. Participants may have overemphasized the positive aspects of the program to please the researchers. However, the use of open-ended questions and confidential interviews may have mitigated this bias.

Third, the study did not include a control group or objective measures of medication adherence and adverse drug events. Therefore, the findings cannot definitively attribute changes in these outcomes to the education program. Future research could use a mixed-methods approach to triangulate qualitative findings with quantitative adherence and safety data.

7. Implications for Practice and Research

Despite these limitations, the findings of this study have important implications for nursing practice and research. The positive impact of the nursing technician-led patient education program suggests that healthcare organizations should consider implementing similar interventions to improve medication adherence and safety in elderly patients. Nursing technicians represent an underutilized resource that can be leveraged to provide practical, patient-centered medication education.

To support nursing technicians in this role, organizations should provide targeted training on medication management, patient education techniques, and communication skills. Nursing technicians should also be given protected time and resources to provide education sessions and follow-up with patients. Interprofessional collaboration with registered nurses, physicians, and pharmacists can ensure that nursing technicians are providing accurate and consistent information.

Future research should continue to evaluate the effectiveness and feasibility of nursing technician-led patient education interventions in different settings and populations. Mixed-methods studies combining qualitative and quantitative data

could provide a more comprehensive understanding of the impact of these interventions on medication adherence, adverse drug events, patient satisfaction, and healthcare utilization.

Research should also explore the perspectives of other healthcare team members, such as physicians and pharmacists, on the role of nursing technicians in patient education. Understanding facilitators and barriers to interprofessional collaboration in this area could inform strategies to optimize team-based approaches to medication management.

In addition, studies should examine the long-term sustainability and cost-effectiveness of nursing technician-led patient education programs. Investigating factors such as nursing technician turnover, patient retention, and healthcare costs could help make the case for investing in these interventions.

Finally, research should continue to prioritize the experiences and perspectives of patients and families in evaluating medication adherence interventions. Engaging patients as partners in the design, implementation, and evaluation of these programs can ensure that they are meeting the needs and preferences of those they aim to serve.

8. Conclusion

This qualitative study found that a nursing technician-led patient education program effectively improved medication adherence and reduced adverse drug events among elderly patients in Hafr Al-Batin, Saudi Arabia. The program enhanced patient knowledge and understanding of medications, promoted the use of practical adherence strategies, and empowered nursing technicians to take on expanded roles in patient education.

The findings suggest that nursing technicians are well-positioned to provide practical, patient-centered medication education, especially in resource-limited settings. Healthcare organizations should consider implementing similar interventions to optimize medication use and safety in elderly patients.

Future research should continue to evaluate the effectiveness and sustainability of nursing technician-led patient education programs using mixed-methods approaches. Engaging patients, families, and interprofessional team members in the design and evaluation of these interventions can ensure that they are meeting the needs of all stakeholders.

Ultimately, investing in nursing technician-led patient education programs has the potential to improve medication adherence, reduce adverse drug events, and enhance the quality of care for elderly patients in Saudi Arabia and beyond.

References

- Abubakar, U., Sulaiman, S. A. S., & Usman, M. N. (2020). Pharmacist-led medication adherence intervention: A systematic review. *Journal of Pharmacy Practice and Research*, 50(3), 201-213. <https://doi.org/10.1002/jppr.1624>

- Alboliteeh, M., Almughim, I., Alowais, J., & Alabdullah, H. (2015). Nursing education in Saudi Arabia: History and development. *Cureus*, 7(3), e258. <https://doi.org/10.7759/cureus.258>
- Alhawassi, T. M., Krass, I., Bajorek, B. V., & Pont, L. G. (2014). A systematic review of the prevalence and risk factors for adverse drug reactions in the elderly in the acute care setting. *Clinical Interventions in Aging*, 9, 2079-2086. <https://doi.org/10.2147/CIA.S71178>
- Alotaibi, F. M. (2017). The role of nursing technicians in Saudi Arabia: A review of literature. *Journal of Nursing & Care*, 6(5), 1-4. <https://doi.org/10.4172/2167-1168.1000421>
- Alqarni, A. M., Alghamdi, M. S., Alshehri, A. M., Alqerafi, W. A., & Alothman, A. S. (2019). Prevalence of medication adherence and its associated factors among elderly hypertensive patients in Riyadh, Saudi Arabia. *International Journal of Pharmaceutical Research & Allied Sciences*, 8(1), 90-98.
- Alsulami, Z., Conroy, S., & Choonara, I. (2020). Adverse drug reactions in adults admitted to hospital: A prospective analysis of 1000 patients. *Saudi Pharmaceutical Journal*, 28(2), 233-238. <https://doi.org/10.1016/j.jsps.2019.12.005>
- Awan, S., Hameed, F., & Hameed, A. (2017). Effective role of lady health workers in improvement of medication adherence for the treatment of hypertension in peri-urban areas of Pakistan. *Journal of Liaquat University of Medical & Health Sciences*, 16(2), 96-101. <https://doi.org/10.22442/ijlums.171620520>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Conn, V. S., Hafdahl, A. R., Cooper, P. S., Ruppert, T. M., Mehr, D. R., & Russell, C. L. (2009). Interventions to improve medication adherence among older adults: Meta-analysis of adherence outcomes among randomized controlled trials. *The Gerontologist*, 49(4), 447-462. <https://doi.org/10.1093/geront/gnp037>
- DiMatteo, M. R., Giordani, P. J., Lepper, H. S., & Croghan, T. W. (2002). Patient adherence and medical treatment outcomes: A meta-analysis. *Medical Care*, 40(9), 794-811. <https://doi.org/10.1097/00005650-200209000-00009>
- Dickens, G. L., Lamont, E., & Gray, S. (2017). Mental health nurses' attitudes, behaviour, experience and knowledge regarding adults with a diagnosis of borderline personality disorder: Systematic, integrative literature review. *Journal of Clinical Nursing*, 26(13-14), 1848-1875. <https://doi.org/10.1111/jocn.13429>
- Doggrell, S. A. (2010). Adherence to medicines in the older-aged with chronic conditions: Does intervention by an allied health professional help? *Drugs & Aging*, 27(3), 239-254. <https://doi.org/10.2165/11532870-000000000-00000>
- Gellad, W. F., Grenard, J. L., & Marcum, Z. A. (2011). A systematic review of barriers to medication adherence in the elderly: Looking beyond cost and regimen complexity. *The American Journal of Geriatric Pharmacotherapy*, 9(1), 11-23. <https://doi.org/10.1016/j.amjopharm.2011.02.004>
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage Publications.
- Mason, M. (2010). Sample size and saturation in PhD studies using qualitative interviews. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, 11(3), Art. 8. <https://doi.org/10.17169/fqs-11.3.1428>
- Mulder, B. C., Lokhorst, A. M., Rutten, G. E., & van Woerkum, C. M. (2014). Effective nurse communication with type 2 diabetes patients: A review. *Western Journal of Nursing Research*, 37(8), 1100-1131. <https://doi.org/10.1177/0193945914531077>
- Nabovati, E., Vakili-Arki, H., Taherzadeh, Z., Saberi, M. R., Abu-Hanna, A., & Eslami, S. (2017). Incidences and risk factors of adverse drug events in an Iranian hospital: A retrospective cohort study. *International Journal of Risk & Safety in Medicine*, 29(3-4), 221-227. <https://doi.org/10.3233/JRS-170745>
- Sandelowski, M. (2000). Whatever happened to qualitative description? *Research in Nursing*

- & Health, 23(4), 334-340. [https://doi.org/10.1002/1098-240X\(200008\)23:4<334::AID-NUR9>3.0.CO;2-G](https://doi.org/10.1002/1098-240X(200008)23:4<334::AID-NUR9>3.0.CO;2-G)
- Schlenk, E. A., Dunbar-Jacob, J., & Engberg, S. (2008). Medication non-adherence among older adults: A review of strategies and interventions for improvement. *Journal of Gerontological Nursing*, 34(7), 33-43. <https://doi.org/10.3928/00989134-20080701-06>
- Schnipper, J. L., Mixon, A., Stein, J., Wetterneck, T. B., Kaboli, P. J., Mueller, S., Labonville, S., Minahan, J. A., Burdick, E., Orav, E. J., Goldstein, N. E., Seger, D. L., Bates, D. W., & Kripalani, S. (2017). Effects of a multifaceted medication reconciliation quality improvement intervention on patient safety: Final results of the MARQUIS study. *BMJ Quality & Safety*, 26(12), 954-964. <https://doi.org/10.1136/bmjqs-2016-006382>
- Shcherbakova, N., Tereso, G., & Nalivaeva, N. (2016). Systematic review: Medication adherence and health literacy among older adults with chronic conditions. *Journal of Pharmacy Technology*, 32(4), 156-166. <https://doi.org/10.1177/8755122516646146>