

Interventions to Increase Patients' Medication Adherence: A Literature Review

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Research is an essential part of the nursing profession and is a continuous process that helps establish and guide best practices within the healthcare field. An important topic of ongoing research in the field of nursing is how to improve patient adherence to their medications. Previous research has shown that when patients are compliant with their medications and take them as prescribed by their providers, they have improved symptoms of their illness, fewer hospitalizations, and lower mortality rates compared to individuals who do not adhere to their medications as directed (Ramachandran et al., 2021). Unfortunately, however, it is estimated that only about 50% of patients with chronic conditions adhere to their medications (Ramachandran et al., 2021). Therefore, this literature review aims to analyze three quantitative studies that assess the effectiveness of different interventions in improving patient adherence to taking their medications. The primary goal of a literature review is to gather previously published research on a specific topic and then provide an in-depth analysis of the literature to establish what is known about the topic and to identify any gaps in current knowledge that would benefit from further research (Houser, 2023). Literature reviews help to add confidence to the importance of specific healthcare topics and determine procedures that can be replicated and adapted to real-life practice (Houser, 2023). Hence, this literature review aims to highlight the importance of patient medication adherence in improving health outcomes and identify what interventions to increase medication adherence could be easily replicated in current nursing practice.

The effects of self-management education tailored to health literacy on medication adherence and blood pressure control among elderly people with primary hypertension: A randomized controlled trial

One quantitative study that examined an intervention to improve medication adherence was specifically interested in targeting elderly patients with uncontrolled hypertension (Delavar et al., 2020). The primary objective of their study was to evaluate the effectiveness of "self-management education," which was tailored to each participant's health literacy level, on antihypertensive medication adherence and overall blood pressure control (Delavar et al., 2020). Self-management education involved face-to-face and telephone educational sessions over six weeks (Delavar et al., 2020). Results of the study found that the tailored self-management education provided to participants significantly improved medication adherence but had no significant effect on control of blood pressure between the control and intervention group (Delavar et al., 2020).

Key Points

This research took place in Iran, and the authors of this study performed a randomized controlled trial on a population of 118 eligible elderly participants who had uncontrolled primary hypertension (Delavar et al., 2020). The participants of this study had to be older than 60, have a diagnosis of uncontrolled primary hypertension, be taking antihypertensive medications, have inadequate health literacy, and have no cognitive disorders (Delavar et al., 2020). Health literacy level was determined using the Health Literacy for Iranian Adults (HELIA) scale (Delavar et al., 2020). The 118 participants were obtained from referrals to the cardiovascular clinic of Fayyazbakhsh Hospital in Iran, and each participant was randomly allocated to a control or an intervention group through block randomization (Delavar et al., 2020).

The researchers of this study analyzed medication adherence and the proportion of participants with controlled blood pressures at the beginning of the study and six weeks afterward (Delavar et al., 2020). To collect and analyze this data, they used a demographic

questionnaire, the eight-item Morisky Medication Adherence Scale, and a datasheet for recording blood pressure values (Delavar et al., 2020). The Morisky Medication Adherence Scale included seven “Yes/No” questions and one question answered on a four-point Likert scale where scores could fall between zero and eight (Delavar et al., 2020). A score of eight meant good medication adherence, six to seven meant moderate medication adherence, and a score of less than six equated to poor medication adherence (Delavar et al., 2020). The authors did a variety of statistical analyses to establish the results of their data, some of which included Fisher’s exact, Chi-square tests, and Mann-Whitney U tests to analyze between-group comparisons (Delavar et al., 2020).

As mentioned previously, the participants in this study were randomly assigned to a control and intervention group, where the control group only received routine care services provided to all patients with hypertension, such as one doctor’s visit, a blood pressure measurement, and a medication prescription (Delavar et al., 2020). The intervention group, however, received hypertension self-management education tailored to their health literacy level via two face-to-face sessions lasting 30-45 minutes and four 15-minute telephone-based sessions (Delavar et al., 2020). The educational materials they received had information on what hypertension is, complications of the conditions, medications for hypertension, and the importance of taking those medications and routinely visiting the doctor for blood pressure monitoring (Delavar et al., 2020).

At the start of the study, 78.5% of participants in the intervention group and 82.7% in the control group had poor medication adherence with no statistically significant between-group differences ($p = 0.639$) (Delavar et al., 2020). At the end of the six-weeks, the authors found that the self-management education resulted in significantly better medication adherence in the

intervention group compared to the control group ($p = 0.002$), where now 50% of those in the intervention group still had poor medication adherence compared to 79.3% in the control group (Delavar et al., 2020). Additionally, after the intervention, the rates of uncontrolled blood pressure decreased in the intervention group, but there was no statistically significant difference between the intervention and control group (Delavar et al., 2020).

Assumptions

The authors' central assumption in this study is that educational materials provided to patients to increase their medication adherence should be based on their health literacy level and uniquely tailored to each individual (Delavar et al., 2020). The researchers make it a point to note that in previous studies, the researchers did not tailor educational materials to each patient's health literacy level, which would influence the effectiveness of the educational materials (Delavar et al., 2020). It can be assumed that the authors of this study believe that an increased health literacy level is associated with increased medication adherence.

Deficit/Conclusion

The authors of this study have a valid line of reasoning. It is essential to consider a patient's health literacy level before providing them with educational materials because if the materials are presented in a manner that is above their understanding, it can significantly impede their ability to effectively follow physician recommendations. However, this study would be more beneficial to the nursing field if they provided examples of the types of educational materials that they provided to the participants. Instead, the authors only state that educational materials were gathered based on previous research (Delavar et al., 2020). Overall, this study shows that to promote adherence to antihypertensive medications, tailoring patient education to their health literacy level is the best practice (Delavar et al., 2020). It highlights the impact of

health literacy on patient education and shows that providing more in-depth education positively affects medication adherence (Delavar et al., 2020). If nurses cannot recognize their patients' health literacy level, then the educational materials that nurses provide may not be as effective as they could be. Careful attention should be paid to each individual when providing educational materials and having a variety of materials on hand at different health literacy levels would be beneficial.

Effectiveness of a multifaceted mobile health intervention (multi-aid-package) in medication adherence and treatment outcomes among patients with hypertension in a low-to middle-income country: Randomized controlled trial

A second quantitative study that analyzed an intervention to improve medication adherence also focused on individuals with uncontrolled hypertension (Arshed et al., 2024). This study took place in Pakistan and evaluated the effectiveness of a mobile health app in increasing antihypertensive medication adherence (Arshed et al., 2024). The mobile health app included educational instructions and reminders that were provided daily to participants (Arshed et al., 2024). The study found that the mobile app effectively increased medication adherence and overall treatment outcomes for patients with hypertension (Arshed et al., 2024).

Key Points

This study was a single-blinded, randomized controlled study where 439 participants were randomly placed into a control or intervention group (Arshed et al., 2024). The intervention group underwent the "Multi-Aid-Package" mobile health app intervention, while the control group received regular treatment without using the app (Arshed et al., 2024). The study site was a randomly selected hospital in Pakistan, and study participants were randomly selected

from a list of patients diagnosed with hypertension who receive care at that hospital (Arshed et al., 2024). To be eligible for the study, participants had to be 18 years or older, be diagnosed with hypertension, and have poor medication adherence to their medications (Arshed et al., 2024). Poor medication adherence was determined using the Self-Efficacy for Appropriate Medication Scale (SEAMS) and by asking the patients the number of pills they took during a specified period (Arshed et al., 2024).

The mobile health app used in the intervention group had seven different educational features that provided instructions and reminders to the participants (Arshed et al., 2024). Reminders could be written, or voice reminders and other educational features included graphic-based messages and animated videos that included information about what hypertension is, the consequences of poorly controlled hypertension, and lifestyle changes that could be made to improve hypertension (Arshed et al., 2024).

The study's primary goal was to assess the change in antihypertensive medication adherence after six months of the mobile app intervention (Arshed et al., 2024). The change was measured using the SEAMS questionnaire, which is a 13-item assessment that uses a 3-point answer scale, where greater medication adherence is associated with higher scores (Arshed et al., 2024). Participants were also questioned about the number of pills they had been prescribed for a certain period compared to the number of pills they took, and from that, adherence rates were then calculated, and patients who scored <80% were categorized as nonadherent (Arshed et al., 2024). Several tools were used to provide statistical analysis of the researcher's data, including the Mann-Whitney U test, the Wilcoxon signed rank test, and chi-square tests (Arshed et al., 2024).

The study found that most participants were between 30 and 49 years old and highly educated males with high-income status (Arshed et al., 2024). Overall, at the six-month follow-up, the median SEAMS score was significantly different between the intervention and control groups ($P < .001$) (Arshed et al., 2024). At the start of the study, the median SEAMS score within the intervention group was 19.5, which increased to 32 at six months, a statistically significant increase (Arshed et al., 2024). In the control group, there was no statistically significant change in the median SEAMS score after six months (Arshed et al., 2024). Additionally, the number of patients with uncontrolled hypertension decreased by 46 in the intervention group ($P < .001$) but remained unchanged in the control group (Arshed et al., 2024).

Assumptions

It is clear from this study that the authors assume that patients benefit from consistent and frequent medication reminders and continuing education about their medical conditions. The authors also believe that providing various educational materials can help increase patient education and medication adherence. The authors made a point to mention that their study results align with previous literature showing the effectiveness of text message interventions on improving medication adherence, but that their study is more effective because it incorporates a variety of interventions all in one app (Arshed et al., 2024). They believe this same technology could be used to help manage other chronic conditions such as tuberculosis, diabetes, and chronic liver diseases (Arshed et al., 2024).

Deficit/Conclusion

The authors of this study have a valid line of reasoning. Their research highlights the benefits of a multifaceted approach to education and the effectiveness of consistent education on

medication adherence for patients with hypertension (Arshed et al., 2024). The implications of their results are important as this same approach could be taken for various chronic health conditions to help even more patients. The authors note that it is also relatively cost-effective to implement (Arshed et al., 2024). An essential and effective part of their mobile health app intervention is allowing users to pick from various educational materials to find the things that work best for them (Arshed et al., 2024). In healthcare, providers must assess their patients' learning styles and select educational materials that best fit them. If nurses skip this part of education, patients will be less likely to fully understand the information given to them and, therefore, be less likely to adhere to instructions like medication adherence.

A randomized encouragement trial to increase mail order pharmacy use and medication adherence in patients with diabetes

A third quantitative study that explored an intervention to increase medication adherence focused on patients with diabetes across three healthcare systems within the United States (Ramachandran et al., 2021). It aimed to answer the research question of whether encouraging patients with diabetes to use mail-order pharmacy (MOP) would increase their use of MOP and improve their medication adherence (Ramachandran et al., 2021). Mail-order pharmacy is when a pharmacy mails prescription medications directly to an individual's home (Ramachandran et al., 2021). Their study concluded that their simple outreach intervention to encourage MOP use moderately increased the use of MOP and improved medication adherence to diabetes medications as measured by number of refills made by patients (Ramachandran et al., 2021).

Key Points

The authors of this study performed a randomized trial to encourage the use of mail-order pharmacy by randomly assigning patients to a control group that received usual care or an intervention group that received outreach to encourage enrolling in MOP (Ramachandran et al., 2021). The study gathered data from 63,012 patients across three healthcare systems in California, Hawaii, and Massachusetts (Ramachandran et al., 2021). To be eligible for the study, participants had to be diagnosed with type 2 diabetes, be at least 18 years old, and be considered non-adherent to at least one of their oral cardiovascular drugs for diabetes (Ramachandran et al., 2021).

Participants in the intervention group received outreach to inform them about MOP and how to enroll via a mailed letter, secure email message, and a telephone call (Ramachandran et al., 2021). The participants were then followed for 12 months from the date of the mailed letter (Ramachandran et al., 2021). At the end of the 12 months, the researchers compared the percentage of participants who began using MOP and those who became adherent to their diabetes medications (Ramachandran et al., 2021). Adherence to medications was established using the “Proportion of Days Covered” method, where non-adherent individuals had a PDC of less than 80% (Ramachandran et al., 2021). The researchers also performed a stratified analysis of their results considering race and ethnicity (Ramachandran et al., 2021).

The authors performed various statistical data analyses to establish their results, including Chi-squared tests, T-tests, Poisson regressions, and Kruskal-Wallis tests (Ramachandran et al., 2021). At the end of the 12 months, the researchers found that 10.6% of patients in the intervention group had utilized MOP, whereas 9.3% of patients in the control group used it (Ramachandran et al., 2021). The patients in the intervention group were considered to have used

the MOP at a statistically significantly higher rate than the control group, with a p-value of less than 0.01 (Ramachandran et al., 2021). Additionally, patients in the intervention group had a significantly greater percentage (42.1%) of medication refills delivered via MOP than the control group (39.8%) with a p-value less than 0.01 (Ramachandran et al., 2021). The authors also found that there were only statistically significant improvements in MOP use and medication adherence among White and Asian race groups (Ramachandran et al., 2021). They also only saw statistically significant results in two out of the three healthcare systems used, and they believe this is due to the one hospital system only encouraging MOP use via a letter in the mail as opposed to via email and telephone as well like the other two hospital systems did (Ramachandran et al., 2021).

Assumptions

The authors of this study assume that increased use of MOP has a positive association with increased medication adherence since medications would be mailed directly to the patient instead of them having to make a trip to the pharmacy (Ramachandran et al., 2021). They state that barriers to using MOP are likely due to a lack of knowledge about what MOP is and how it works, and therefore, it is important to educate patients about MOP and how they can enroll in it (Ramachandran et al., 2021). The current study does not directly compare the effectiveness of the different ways MOP was encouraged to patients, such as via a letter in the mail versus an email or phone call, but it can be assumed from their results that more patients would likely utilize MOP if multiple communication strategies were used to inform them about MOP (Ramachandran et al., 2021).

Deficit/Conclusion

The authors of this study have a valid line of reasoning in hypothesizing that increased MOP use would correlate with increased medication adherence (Ramachandran et al., 2021). Having to go to the pharmacy to obtain medications can be a barrier for many patients to access their medications. MOP would allow them to mail their medications directly to their door (Ramachandran et al., 2021). The authors noted that MOP was a service already offered by the three hospital systems they studied and that free shipping was included in the program (Ramachandran et al., 2021). Their intervention highlighted a simple and cost-effective way to improve patient medication adherence (Ramachandran et al., 2021). Nurses could easily implement this intervention during the discharge of patients. Nurses already ask patients for their preferred pharmacy, and therefore, if more hospitals utilize a MOP system, nurses could incorporate enrolling patients in MOP as part of the discharge process. Nurses and healthcare providers, in general, must recognize the barriers that patients may face to stay compliant with their medications. With MOP, it could eliminate the barrier of going to the pharmacy and thus improve overall medication adherence, just as the authors of this study showed (Ramachandran et al., 2021).

Conclusion

The literature shows that several types of interventions can improve patients' medication adherence (Arshed et al., 2024; Delavar et al., 2020; Ramachandran et al., 2021). The literature focused on increasing medication adherence in patients with chronic conditions such as hypertension and type 2 diabetes (Arshed et al., 2024; Delavar et al., 2020; Ramachandran et al., 2021). This is important and relevant research as it is estimated that only about 50% of patients with chronic conditions adhere to their medications (Ramachandran et al., 2021). Interventions primarily involved electronic methods of contacting patients with a common theme of providing

patient education about their disease process and the importance of taking their medications in the hopes of increasing their medication adherence (Arshed et al., 2024; Delavar et al., 2020; Ramachandran et al., 2021). Increased medication adherence is associated with improved patient outcomes, and all three studies included in this literature review found success with their interventions to improve medication adherence for chronic conditions (Arshed et al., 2024; Delavar et al., 2020; Ramachandran et al., 2021). For example, the risk of death due to a cardiovascular event like a stroke is lowered by twofold for every 20 mmHg drop in the systolic blood pressure for people between the ages of 40 and 69 years old, and in order to see those drops in blood pressure patients must consistently take their medications (Arshed et al., 2024).

The results of these studies also have far-reaching implications for nursing practice. Nurses are vital patient educators and must understand how to educate each patient best. These studies show the need to tailor educational materials to patients based on their health literacy level and preferred learning style (Arshed et al., 2024; Delavar et al., 2020; Ramachandran et al., 2021). Patient admissions and discharges are most frequently handled by nurses, and these times provide a perfect opportunity for nurses to assess their patient's health literacy level, their preferred learning style, and any barriers they may have to accessing their medications. By understanding these factors, nurses can provide better quality education to their patients and encourage the use of electronic interventions such as those utilized in the aforementioned studies (Arshed et al., 2024; Delavar et al., 2020; Ramachandran et al., 2021).

Moreover, these quantitative studies highlight areas for quality improvement, such as the importance of consistent and frequent patient education to improve medication adherence and how important it is to assess health literacy level before providing said patient education (Delvar et al., 2020). This can also be achieved by providing electronic platforms where users can search

various educational materials to find things that best fit their learning style (Arshed et al., 2024). Improvement efforts should also be made to assess other barriers to patients adhering to their medications, such as making them easier to obtain through mail-order pharmacies (Ramachandran et al., 2021).

Lastly, the studies included in this literature review call attention to how healthcare as a whole can be improved through these interventions to improve medication adherence and overall patient outcomes (Arshed et al., 2024; Delavar et al., 2020; Ramachandran et al., 2021). All of the studies utilized simple, low-cost, and easily replicated interventions that can be implemented for a wide variety of chronic diseases, from hypertension to diabetes and COPD (Arshed et al., 2024; Delavar et al., 2020; Ramachandran et al., 2021). It is clear that when patients are provided consistent education on their condition, reminded frequently to take their medications, and equipped with services such as MOP, then their overall adherence to their medications improves, which, in turn, improves their overall health (Arshed et al., 2024; Delavar et al., 2020; Ramachandran et al., 2021).

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