Medication Compliance of the Elderly Population

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Abstract

In the United States there are over seven million elderly adults who live within the community and utilize home healthcare services. This number is expected to escalate in the upcoming years. As a result, the number of community dwelling patients with chronic diseases will expand, as will the amount of prescriptions needed to treat these conditions. This reality forces healthcare providers to consider problems that may arise, including poly-pharmacy and increased prevalence of medication errors, including drug omissions, late administration and taking medications without orders. This paper evaluates the effectiveness of the use of organizers, cues and interventions to improve adherence to medication regimens. The literature that was used as the basis of this research consisted of a series of systematic reviews, meta-analysis, and randomized control trials that analyzed the use of pillboxes, prepackaged medications, and telephone cues in groups of older adults. The data collected was relevant to the PICO question: What interventions can be implemented by community nurses to improve medication compliance in the elderly population? One review used follow-up phone calls whereas others used surveys and self reporting to measure adherence. Cognitive abilities were also evaluated. This examination points out knowledge deficits of medication administration among older adults, the issue of physical and cognitive obstacles faced by this cohort, and evaluates the efficacy of organizers in improving adherence. With the growing rate of aging Americans, it is essential for all homecare agencies to address the issue of medication compliance among older adults.

 *Keywords:* compliance, omissions, elderly, organizers, cues, community.

Review of Literature

The foundation of this evidence base practice poster comes from a series of quantitative research studies that are mentioned in the following paragraphs. They gather information and support the PICO topic about elderly clients and factors that may lead to non-adherence to medications. Systematic reviews, meta-analysis and randomized control trials, were used as the groundwork of this research. A majority of the literature was accessed via the Pace University database.

The research began with an article from the *American Journal of Health Behavior*. The article was titled “Older Adult Medication Compliance: Integrated review of randomized control trials” written by **Russell**, Conn, & Jantarakupt (2006). It provided the core of the PICO question by raising the topic of elderly patients and their abilities to self-medicate at home. It used a randomized control trial to experiment and collect data but was flawed because of the failure to collect adequate reporting from the participants (**Russell**, Conn, & Jantarakupt, 2006). In addition, no valid data could be drawn from this article due to the fact that only a structured abstract was accessible.

DeBartolomeo-Mager and Madigan (2010) conducted a pilot study to show the severity of medication non-compliance in the home. The research focused on 10 males and 20 females who were receiving homecare from visiting nurse services. Overall, this study conveyed that there is a need for nursing interventions to improve medication compliance in the homebound patient; however, there was no testing or examination of any specific intervention; such as pill boxes. In addition, the small sample size of this study makes the results questionable.

Lam, Elliott, and George (2011) use a meta-analysis in which they describe ways to improve patient medication compliance in the home by using Self Administration of Medication Programs (SAMP). The study was conducted by pharmacists who limited their population to people over the age of 65, on at least three long term medications, have no history of dementia or cognitive impairment, and who are fluent in English. This study utilized patient surveys that were conducted over the telephone after two weeks of discharge from an acute care setting. The Hawthorne Effect might have been an issue, whereby the respondents exaggerate their compliance to please the researchers or perhaps to not reveal what they were actually doing with their medications. This study also has issues related to reliability and validity of findings in terms of application to a broad spectrum of patients in the community setting. This was a pilot study that used a small sample (N=24) and was limited to one specific unit of the acute care hospital setting. This study neglects a core population of clients who are cognitively impaired (ie. alzheimers and dementia patients), which are possibly more likely to have issues with medication compliance. As a result, the evidence presented in this article may not be a realistic representation of the general homebound patient population. The authors conclude that further study using “a controlled trial with adequate power and a longer follow-up time is warranted” (Lam, Elliot, & George, 2011, p. 85).

Littenberg, MacLean, and Hurowitz (2006) conducted a study to determine if the use of adherence aids would improve diabetic medication compliance. Their study was based on a cross sectional analysis. The researchers randomly selected 289 diabetic subjects, 51% being female whose average age was 65 years. Although the study used a small population and only looked at a group of diabetic patients, the results of the study are still valid because the subjects were randomly selected and the authors were able to make a recommendation to use pill organizers with support from the data provided from their research.

Fulmer, Kim, Montgomery and Lyder (2001) reviewed several studies as a relevant secondary resource related to the PICO topic. These authors discussed past studies performed regarding medication compliance, and concluded that adherence is a major issue and a very complex matter. As a secondary source it does not hold as much weight in terms of evidence, but it did mention some ideas that are applicable to increasing patient adherence to medications and can be used to construct methods and interventions that can be implemented in our care for the homebound elderly patient population.

Methods

 “The Use of Adherence Aids by Adults with Diabetes” by Littenberg et al. (2006) focuses on the use of adherence aids for adults with diabetes. It is a cross sectional survey of patients living in Vermont, Upper New York State, and New Hampshire. It used a group of 289 patients that were studied to examine the efficacy of various aids for physiological control of diabetic patients who use oral agents for hyperglycemia, hypercholesterolemia and hypertension. This study used chi-square tests and t-tests to compare means of the group members who used different aids to assist them to adhere to medication regimens. A limitation of this study's design is that there was no random assignment of participants to the adherence tool used.

 An article found in the *Journal of Clinical Pharmacy and Therapeutics*, written by Lam et al. (2011), utilized SAMP, the Drug Regimen Unassisted Grading Scale (DRUGS) and the Tool for Adherence Behavior Screening (TABS) to study twenty-four participants at a secondary care teaching hospital in Melbourne, Australia. Descriptive statistics were used to differentiate patient characteristics that would make them more unlikely to be non-adherent to their medication regimen. Changes in SAMP compared to TABS scores were analyzed using paired sample t-test and Wilcoxon-signed rank test.  The target population was 180 patients, however, some volunteers were not included in the research because they failed to meet the criteria of the study. As a result, the study looks at a very small sample and results may be skewed by such a factor.

Fulmer et al. (2001) wrote a systematic review entitled, “What the Literature Tells Us About the Complexity of Medication Compliance in the Elderly”. The article views a variety of studies related to the subject of elderly patient adherence to medications. A majority of the studies analyzed a cohort group of elderly individuals who are primarily community dwelling individuals. Multiple-choice questionnaires on adherence behaviors prior to discharge to address socio-cognitive variables associated with adherence behaviors is included in one of the studies discussed in the article.  Follow up interviews were conducted as well to collect data on adherence to medications from self-reporting of participants.

### In “Medication Use Among Older Adults in a Home Care Setting” by DeBartolomeo-Mager and Madigan (2010), a simple random sample was used to select participants for their pilot study. This study was conducted at the VNA in the northeastern United States. The criteria for their participants included having to be over the age of 65, had at least two medications prescribed per day, and were receiving homecare by the VNA. Participants with the diagnoses of cognitive impairment, dementia, or mental illness were excluded. Out of 109 subjects 31 were chosen, one participant was lost due to hospitalization and 30 subjects completed the study. All subjects were identified by a number assigned to them for privacy and confidentiality. This study was approved by the institutional review boards of the VNA and Case Western Reserve University. The omission of the mentally unstable clients skews the data and evidence regarding the need to assess patients’ capabilities prior to assessing a patient’s need for the use of cues and organizers to increase medication adherence.

Synthesis of Findings

The article, "What the Literature Tells Us About the Complexity of Medication Compliance in the Elderly” by Fulmer et al. (2001), groups a series of research studies performed to test medication compliance in the elderly population. Fulmer mentions a study done by Nikon in 1996, which focused on the physical ability of elderly patients to open pill bottles and remove medications. The results of this study showed that the elderly with cognitive, vision impairments, and low manual dexterity had a difficult time taking their medications. Another study cited within the article was conducted by Fineman and DeFelice who used surveys to measure the compliance and knowledge of a group of elderly people at a senior center. The results showed: of the forty-seven elderly surveyed, 85% were taking their medications properly. However, only 68% of the individuals were able to identify the name of the medications, and 59% did not understand the treatment regimen they were following. Despite the larger number who reported that they were following the medications schedule as ordered, more than half of them did not have the knowledge of why they were taking these medications and what their side effects are. Overall the various research studies presented in this article concluded that in order to increase medication compliance among the elderly population, several things must be taken into consideration including: re-evaluating patients’ knowledge; simplifying the medication regimen; and using organizers, pill boxes; and reminder cards (Fulmer, Kim, Montgomery, & Lyder, 2001).  All of these suggestions can be implemented by the community or home health nurse.

 In "The use of adherence aids by adults with diabetes: A cross-sectional survey", the authors, Littenberg, MacLean and Hurowitz (2006), used a cross sectional survey to examine if the use of adherence aids reflected an increase in medication compliance. The adherence aids used for this study included: pill boxes, placing pills in a special location, and taking the medication with an event (meal or bedtime).  The results revealed that using more than one aid increases medication compliance. For this particular study, the authors concluded that even though the use of aids may be practical and convenient to some, there is not enough evidence to demonstrate that they are effective.

In the article, "Impact of self-Administration of medications programme on elderly inpatients' competence to manage medications: A pilot study" by Lam, Elliot and George (2010), the authors used SAMP on elderly inpatients to measure adherence behaviors. Overall results of the study revealed that if the patients were educated before discharge and were able to successfully self-administer his or her medications prior to discharge, the number of patients adhering to medication regimens would increase.

 DeBartolomeo-Mager and Madigan (2010) wrote “Medication Use Among Older Adults in a Home Care Setting”. They depict a descriptive pilot study conducted by a Visiting Nurse Agency in the United States with a sample size of 30 participants who indicated adherence through completion of a survey. The survey included questions on whether or not they had taken their medications and used correct dosage and timing. The results of the study showed that throughout the course of the three phone calls, 46% of participants reported they had omitted medications in one day. Another 46% also reported medication omission the day prior to receiving the phone call. The participants were asked reasons why they had not taken their medications as prescribed and they reported the following reasons: participant fell asleep and missed a dose, medication was perceived as unnecessary, participant forgot, participant ran out of medications, or no apparent reason (DeBartolomeo-Mager & Madigan, 2010). To think that almost half of the participants selected for this study reported a medication omission is an alarming fact that must be addressed. DeBartolomeo-Mager and Madigan (2010) expressed a concern; these medication errors are being made by people who are stable as opposed to newly discharged patients from the hospital and those who are new to the homecare system. This raises awareness about how poorly non-stable and new homecare patients may be doing with their adherence to their prescribed drugs.

Decision About Practice

“Medication Compliance, also referred to as medication adherence, is an extremely complex and important component of understanding the wellbeing of older people” (Fulmer et al., 2001, p. 43). Community and visiting nurses have the unique opportunity to assess the management of each patient within the home setting, to identify life threatening concerns related to medication usage, and to observe and report obstacles that prevent the patient from taking the medications as prescribed. As advocates of the patient population, it is the nurses’ responsibility to address any issues that may put a patient in danger; this includes self-administration of a medication for the reason that it can put an individual’s life at risk. Elderly patients are among the most likely of populations to be non-adherent with a medication prescription because of sensory impairments (particularly visual), confusion, and poverty or diminished income. As stated in “Medication Use Among Older Adults in a Home Care Setting” by DeBartolomeo- Mager and Madigan (2010), nearly 32 million older Americans are community dwelling and as the population of older adults grows, the prevalence of chronic diseases and use of medications will follow. As a result, it is important for homecare nurses to be knowledgeable of the functional status and capabilities of their patient population and to recognize that the well-being of older adults relies on a well-informed partnership between the patient and the clinician team (Fulmer et al., 2001). Homecare nurses should encourage the use of pillboxes, follow-up phone calls, request agencies to provide medi-planner pillboxes and make referrals to get other equipment (eg. Magnifying lenses or automatic pill dispensers).

The issue of polypharmacy compounds the problem and is overwhelming in terms of the number of different medications, time to take them, and knowing about what each medication is used for (Lam et al., 2010). Findings from Lam et al. (2010) provided evidence that their research is applicable to community health nurses because they work directly in homes with patients and families. Nurses should assess patient and family capabilities of medication management and educate them about methods to improve their compliance as it is in their scope of practice. According to the Agency for Healthcare Research and Quality, determining the abilities, limitations and health literacy in self-administration of medications is part of the nursing assessment of any client that is being discharged from the hospital, regardless of age or nature of disease (Zwicker, Mezey, & Fulmer, 2008). This became a guideline adopted by the United States and recommends close follow-up monitoring after discharge from the hospital.

Along with the roles of ensuring safety, advocating, providing education and supplying referrals to the patients as community nurses, it is also a responsibility of the nurse to promote empowerment. Empowering the patient means giving them the opportunity to practice independence. What can be more empowering than being able to self-medicate, be knowledgeable of one’s own health status and to be in control of one’s treatment? As stated by Lam et al. “…providing patients with an opportunity to self medicate in a supervised setting with education and support promotes confidence and competence in their medication management at home after hospital discharge” (2011, p. 81). The same support could come from the use of pill organizers and cues.

Implementation

How can nurses take these findings and apply them to practice? Clearly there are multiple methods that may help improve medication adherence. According to the study done by Lam et al. (2011), the efficacy of implementing a SAMP and its impact on the self management of medication administration in the geriatric population is positive and may be one intervention to consider prior to the use of cues and pillboxes. As stated in the article, “A SAMP with increasing levels of independence maybe a useful addition to medication discharge planning in the aged care rehabilitation setting” (Lam et al., 2011, p. 85). The first step towards implementing a plan for patients to self manage their medication would be to assess if the patient is coherent enough and physically functional to organize and administer their own medications. Fulmer et al. (2001) tackles this concept as they suggest the use of the Mini-Mental Status Exam (MMSE) in identifying depression as well as testing skills, such as opening a pillbox. These exams can help healthcare providers determine what types of tools and cues the patient may need to use in order to be compliant with their medications. Fulmer et al. (2001) addressed the medication compliance issue among the elderly, citing several factors complicating the matter at hand. Issues like visual acuity, manual dexterity, and mental competency would all be noted when comprising a feasible plan for patients to safely medicate themselves. VNS nurses can then advocate for their patients to receive these specialized medication boxes through subsidized costs. The medication boxes should be loaded and programmed by VNS nurses.

 The VNS nurses should be responsible for educating all patients, family members, and caregivers (i.e. home attendants) involved in the patient’s care, as it is in their scope of practice. A mandatory in-service could be a requirement on proper use of the medication boxes. These boxes would be programmed, by the doctors and nurses caring for the patient, to dispense specific medications at a specified time. The medication box would have time sensitive alarms and audio recordings for those patients that are visually impaired. The audio recording would state the name of the drug dispensed. Other aids that might be useful include checklists, calendars, special packaging, clock faces attached to pill bottles and even emails, text messages or pagers if we try to take advantage of our new age technology (Littenberg, MacLean, & Hurowitz, 2006). The nurses should also perform follow-up phone calls, asking patients about any questions or concerns affecting their medication adherence. This intervention of using phone calls has actually been adopted by the United States and is a guideline to nursing care according to the Agency for Healthcare Research and Quality (Zwicker et al., 2008).

Patients should have regularly scheduled meetings with a social worker to discuss non-medical issues such as cost of medication. Health is a collective effort in the geriatric population, and both VNS and social work should work in collaboration with the patient to create a plan that will help the patient be adherent with their medicine while still allowing them to have some sort of independence (Fulmer et al., 2001). The real life applications of patients self-medicating themselves would empower these patients to feel a greater sense of independence as they will be proactively managing their own health (Lam et al., 2011).

Community Nurses can also advocate for the patients who can’t afford adherence aids such as the sophisticated computerized dispensing machines. If funding is an issue, patients can always resort to the weekday labeled pill boxes, or the simple calendar pencil method. Whatever intervention is chosen, the nurse has to determine if it is suitable for the patients capabilities and should monitor and follow up on adherence.

Aside from the use of cues, organizers and phone call or text message reminders, it is also important the healthcare providers look at each patient’s medication regimen and make alterations to prescriptions, as suggested by DeBartolomeo-Mager and Madigan (2010). In their study, patients were not taking medications because they were too big to swallow or because they could not stay up to take their evening doses. The study concluded that “an individualized medication regimen should be explored with the patient, physician and pharmacist… to decrease the number of [medication errors]” (DeBartolomeo-Mager & Madigan, 2010, p. 20).

Evaluation

One final detail that must be taken into consideration prior to the implementation of using tools and interventions to improve medication adherence is to determine whether these strategies can realistically be applied to homecare. As described above, the use of both the self-administration of medications program (SAMP) and the incorporation of the Drug Regimen Unassisted Grading Scale (DRUGS), worked best when used together. The DRUGS instrument was useful in identifying difficulties patients had with medication management (Lam et al., 2011). Applying SAMP to newly discharged patients is a practical intervention since this simple assessment tool is able to identify adherence behavior and patient knowledge which in turn will be a good indicator of whether or not the patients will be able to comply with medication regimens. This will help healthcare providers address any obstacles the patient may face against maintaining compliance and will prevent complications of medication errors that might be missed once the patient is already home.

The use of the MMSE was effective in determining cognitive deficits. A MMSE score less than 24 was found to be a risk factor for poor outcome on the medication management assessment (Lam et al., 2011). The evaluation of specific patient factors such as patient education, visual acuity, mental dexterity to assess competency, can be performed by the home health nurse. In fact, the study shows how it improves the likelihood that the patient will comply with the specified regimen. Supplying checklists, calendars, voice recordings and alarms are effective with enhancing the patient’s chances of compliance. “Even modest increments in adherence could have substantial impacts upon clinical outcomes and costs” (Littenberg et al., 2006, p.2).

Adherence aids do not necessarily have to be widely successful in order to be valuable. For instance, an intervention such as a day of the week pill box or a medication calendar, that costs no more than a few dollars per patient, would be cost-effective if it helped just one patient lower their A1C by even one percentage point (Littenberg et al., 2006). In the study done by DeBartolomeo-Mager and Madigan (2010), patients that were closely observed by the entire medical staff, consisting of doctors, nurses as well as pharmacists, decreased the risk of alterations in medication administration. Medication errors were greatly reduced when all medical staff collaborated with each other to evaluate just what was going on within the home. Follow-up phone calls were able to reveal not only the error itself but identified reasons for the error. For example; if a patient stated there was an omission in medication, there would be follow-up questions, as well as a documented reason (i.e. patient missed dose because they fell asleep prior to scheduled time). In the end phone calls began to reveal that the patients overall outcomes and experiences were greatly improved with the collaboration and follow-up of medical staff.

DISCUSSION

In the case of older adults, does the use of organizers and cues improve medication compliance in the home setting? Yes. As we may know, the community dwelling elderly population is at risk for medication errors and non-adherence due to their complex medication regimens that are targeted at treating chronic diseases. Lam et al., used the SAMP method to assess the correlation of medication errors and non-adherence related to education, coherence and physical function. Littenberg et al., observed the use of several different medication aids. The most popular used medication aids were the day of the week pillboxes, putting medications in a special place or associating taking their medication with a daily cue such as a meal, TV show, or bedtime.  The results of the study showed that patients who utilized organizers and cues had better adherence than those who didn’t use any type of aids.

DeBartolomeo-Mager and Madigan (2001) report two-thirds of the community dwelling older patients who are receiving homecare services are likely to make medication errors. Their study is particularly concerning in that the subjects used to conduct the research were less stable than those who were recently discharged home from the hospital or were new to home healthcare.

Conclusion

 From a clinical perspective it seems home health clinicians need to consider all home healthcare patients at risk for medication error. Due to the growing number of aging adults in the United States, it is essential to implement strategies that will improve compliance out in the community to decrease hospital stay and cost, and to prevent injury from medication errors. Some interventions that were considered reasonable included the use of assessments to determine whether patients are physically and cognitively capable of self administration, follow-up phone calls to reinforce education on prescriptions, the use of pill organizers and cues such as placing pills in a special location, taking the medication with an event, and the use of technology like text messaging or email reminders. In total, the efficacy of the previously studied aids such as pillboxes, cues, and reminder phone calls has yet to be determined; however, it can only improve compliance and will not hinder it, so it is crucial that homecare nurses encourage and advocate for the use of these aids.

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