Brown Bag Medication Review

CE 1.5 Contact Hours

Using AHRQ's Brown Bag Medication Tool

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ABSTRACT

Background: Medication nonadherence has been linked to health literacy and poor patient outcomes. The Health Literacy Universal Precautions Toolkit addresses both issues.

Purpose: A brown bag medication review was implemented to identify medication nonadherence in a Midwestern clinic.

Methods: Adult patients were instructed to bring all prescribed and over-the-counter medication to office visits. A reviewer transcribed administration directions and the patient's verbal instruction of how the medication is taken.

Results: The study found 58% (n = 28) of 48 participants were nonadherent for at least 1 medication; 26% (n = 72) of all medications were nonadherent; and mental health drugs were the highest nonadherence category at 38% (n = 11). The majority of medication nonadherence was due to lack of access.

Conclusions: This drug utilization review was found helpful in identification of causes for medication nonadherence, assisting prescribers, and improving patient education.

Keywords: AHRQ Health Literacy Universal Precautions Toolkit, drug utilization review, health literacy, medication adherence, patient education

Medication adherence is the extent to which patients follow the recommendations for prescribed treatments.[1] Medication adherence for self-administered medication has been estimated around 50%, while asymptomatic illnesses such as hypertension have been noted to have as little as 20% adherence rates.[2] Medication nonadherence occurs when an individual fails to correctly self-administer a medication per the prescriber's instructions. Medication nonadherence has been associated with increased patient mortality and morbidity,[1] as well as $105 billion of avoidable health care costs annually.[3] The development of preventive interventions to decrease health care costs while subsequently increasing patient outcomes is important.[4] Low-cost interventions aimed at addressing lifestyle choices and education that affect medication adherence may offer the best cost-benefit ratio for all stakeholders.[5]

The Agency for Healthcare Research and Quality has developed a Health Literacy Universal Precautions Toolkit[6] that identifies "in-office" medication reviews as a possible intervention to offset the effects of low health literacy on medication nonadherence. The purpose of this project was to evaluate and quantify medication adherence in a low-income population using the Brown Bag Medication Tool (BBMT) as described within the Toolkit.

LITERATURE REVIEW

Health literacy refers to an individual's ability to access, understand, and use health information, including an individual's ability to correctly self-administer medication.[7] Health literacy is a difficult concept to measure especially considering the limited time providers have with patients in the clinic environment. Many of the tools designed to assess health literacy, such as the Rapid Estimate of Adult Literacy in Medicine, the Newest Vital Sign, and The Health Literacy Questionnaire, often require large amounts of time and analysis or may not be feasible in a clinic setting.

The Toolkit was designed to assess health literacy in each patient encounter in the clinic. The kit is composed of 20 tools addressing

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multifactorial aspects of health literacy including tool number 8, the BBMT. A brown bag medication review is a feasible intervention to address medication adherence rates in a clinic for low-income primary care patients.

MEDICATION ADHERENCE

Medication adherence has dramatic effects on the health outcomes of patients with chronic illness. The IMS Institute for Healthcare Informatics[3] found the highest avoidable cost due to nonadherence in chronic conditions includes hypercholesterolemia, diabetes, and hypertension. Medication nonadherence related to chronic conditions such as chronic obstructive pulmonary disease, mental health disorders, and cardiovascular disease demonstrated marked increases in cost as well as negative patient outcomes including premature death.[8] Wong et al[9] conducted a large cohort study (n = 218 047) in which they compared long-term outcomes, including mortality, to patient adherence. Researchers observed a significant relationship between medication nonadherence and premature death.

Patient-provider relationships and self-efficacy have also been noted to influence medication adherence. There is a higher risk for low medication adherence among patients with a belief that they are in good health and those with a newly diagnosed chronic disease.[2] One large factor often overlooked by prescribing providers is cost of medication. In a review of filled prescriptions, those medications in the upper one-fourth of price range were significantly less likely to be filled.[10]

Medication adherence data collection includes multiple techniques, such as self-reporting, electronic records review, and pharmacy record reviews; however, no consensus of the best approach has been identified.[11,12] Researchers have observed significant correlations between knowledge and beliefs with medication adherence. Education for patients resulted in the best medication adherence outcomes when it was formulated to include simplified dosing, decision aids, and electronic prescriptions.[8]

A Cochrane review of 182 studies found no consensus in identifying a single intervention to increase medication adherence. However, education was identified as a common theme in most successful intervention programs.[8] Multiple successful strategies had common themes to improve adherence including patients' knowledge about the purpose of medications, patient and provider monitoring adherence, and provider awareness of the importance of individualized care plans, including cost considerations.

BROWN BAG REVIEWS

The intervention, brown bag medication review, has demonstrated promise in promoting medication adherence. Brown bag medication review has been observed to decrease patient concerns about their medication while increasing views of medication necessity. However, the use of intense discussion about medications has the potential to promote negative beliefs about ones' medication.[13]

A brown bag review within the elderly population demonstrated additional positive outcomes outside medication adherence. Health care providers were able to identify several drug-related problems in the clinic setting, including nonadherence, which resulted in increased safety of medication administration. Participants reported 63% compliance with provided recommendations related to drug-related problems. In addition, participants expressed satisfaction with the review.[14]

Medication nonadherence through interventions such as a brown bag review includes duplicated medication with double-dose administration, continued self-administration of a discontinued medication, incorrect identification of medication at home and subsequent discontinuation of the wrong medication, incorrect frequency administration of a potential life-threating medication, and wrong identification of pain relief medications.[15,16]

The use of the medication review within an interprofessional team found improvement in the quality of medication therapy, including adherence, as well as patient outcomes.[17] Support for medication reviews has been expressed by providers. Twelve clinics were designated to test the Toolkit, with 2 of those clinics specifically assigned to pilot the brown bag review. The success rates for the brown bag reviews were so impressive that 8 of the 12 clinics (including some who had not initially tested this particular tool) had plans to make use of the medication review as part of their standard practice.[18]

The purpose of this project was to evaluate medication adherence in a low-income population through the use of a health literacy tool.

The BBMT was used as described within the Toolkit.[6] Additional foci of this project included identification of types of medication where adherence rates are low, if interactions with over-the-counter (OTC) medications are prominent, and of needed educational opportunities.

METHODS

This project involved a medication review at a low-income clinic in a Midwestern city in the United States. The clinic services are offered largely by local providers including nurse practitioners, physicians, and physician assistants, some of which are provided on a voluntary basis. Patients are not charged any fees for the visit; however, a suggested donation of $5 is encouraged. A unique aspect of the clinic is that many of the medications prescribed during an office visit are distributed at the clinic through donation.

Following institutional review board approval, patients agreed through verbal consent to participate in the project. The sample included consenting adults between the ages of 18 to 64 years within a family practice setting. Prior to the scheduled appointments, a staff member contacted each patient with requests that they bring all medications to the scheduled appointment, including vitamins, herbs, and OTC medication taken at home through self-administration. Participants were instructed to bring empty bottles to appointments, including those they may have run out of or stopped on their own. Preceding the provider appointment, a review of medication from the bottles was completed.

The review included verification of name of medication, dose, frequency, and duration from the bottle. The information compiled from the bottles was then compared with the patient's description of self-administration. All information was transcribed on a medication data sheet, which allowed for side-by-side comparison of medication and identification of nonadherence. The information from the transcribed data sheet was made available to the provider and used for data analysis. Providers were given an updated medication list with identified occurrences of nonadherence, giving potential opportunities for education. The BBMT reviews were conducted over 10 clinic days.

RESULTS

A total of 48 participants had medication reviews from the 2 designated clinic sites. Thirty-eight of the participants were female. Participants' ages ranged from 25 to 64 years, with a mean age of 48 years (standard deviation, 9.55). Individuals who were pregnant were excluded. The participants brought in an average of 5.8 medications to be reviewed, with a range of 1 to 14 medications per person.

Overall adherence by participant

Of the 48 participants, 58% (n = 28) had at least 1 medication deemed nonadherent, while 42% (n = 20) verbalized taking every medication as indicated on the bottle. Of the 28 participants who were nonadherent, self-discontinuation was the main reason for medication nonadherence at 39% (n = 11). This was followed by the patient self-administering the incorrect dose (29%, n = 8). The inability to obtain the medication was reason for 25% (n = 7) of nonadherence incidences, while inaccurate frequency of self-administration accounted for the remaining 7% (n = 2).

Medication adherence by individual medication

A total of 278 medications were reviewed and organized into 20 different medication categories, regardless of mechanism of action (see Supplemental Digital Content, Figure 1, available at: http://links.lww.com/JNCQ/A566). Of the 278 individual medications, 26% (n = 72) of the medications were nonadherent while 74% (n = 206) were taken as indicated on the medication bottle. Availability of medication was the main cause for nonadherence at 60% (n=43) of the medications. Self-administration of inaccurate dosage (26%, n = 19) and frequency (14%, n = 10) accounted for nonadherent medications (Table). Unavailability of medication included both self-discontinuation and inability to obtain the medication.

Medication adherence by drug category

Antihypertensive medications included 46 medications with 30% (n = 14) nonadherence; the rest were taken as indicated on the medication bottle. Of the 29 mental health medications, 38% (n = 11) were nonadherence mainly because of unavailability of the medication (Table). Noncontrolled pain medications (n = 23) had 22% (n = 5) nonadherence. The main reasons given were both unavailability and wrong dosage. Of the 14 controlled pain medications

Table. Medication Categories and Percentages of Adherence Versus Nonadherence Including Reason for Nonadherence

			Reason for Nonadherence		
	Adherence n (%)	Nonadherence n (%)	Unavailable n (%)	Incorrect Dose n (%)	Incorrect Frequency n (%)
Medication (278)	206 (74)	72 (26)	43 (60)	19 (26)	10 (14)
Hypertensives (46)	32 (70)	14 (30)	12 (86)	2 (14)	0 (0)
Gastrointestinal (20)	14 (70)	6 (30)	6 (100)	0 (0)	0 (0)
Cholesterol (27)	17 (63)	10 (37)	7 (70)	1 (10)	2 (20)
Controlled (14)	9 (64)	5 (36)	0 (0)	4 (80)	1 (20)
Noncontrolled (23)	18 (78)	5 (5)	2 (40)	2 (40)	1 (20)
Hypoglycemic (29)	23 (70)	6 (21)	3 (50)	2 (33)	1 (17)
Mental health (39)	28 (62)	11 (38)	8 (73)	2 (18)	1 (9)

reviewed, 36% (n = 5) were nonadherent (with all of these resulting in ingestion of medication greater than the indicated dosage in a 24-hour period).

Oral hypoglycemic medications (n = 29) had 21% (n = 6) nonadherence. Of the 27 cholesterol medications reviewed, 37% (n = 10) were nonadherent, due to unavailability (n = 7) of medication. Gastrointestinal medications (n = 20) had 30% (n = 6) nonadherent, again due to unavailability of medication (Table).

The main cause of medication nonadherence in all major reviewed medication categories, with the exception of pain medication, was unavailability of the medication. Occurrences of unavailability for individual medications were directly related to running out of the medication or self-discontinuation of the medication itself. Every incidence of controlled pain medication nonadherence was a result of inaccurate dose or frequency. Of the 48 participants, only 2 had a potential interaction with OTC medication. In both cases this was a result of the patient exceeding the recommended daily dose of nonsteroidal anti-inflammatory drugs.

DISCUSSION

The study's 58% nonadherence rate validates the Brown et al[2] estimate of patient nonadherence rates of 50%. It supports that a brown bag medication review can accurately identify areas of medication nonadherence and further demonstrates variances in adherence by medication categories.

Mental health medications had the highest nonadherence rate at 38% of the 28 participants. The most common reason was unavailability of the medication. The observed nonadherence rates support previous studies including Kane et al,[19] who estimated the nonadherence rate for mental health medications to be 40%.

The majority of noncontrolled pain medication nonadherence was due to unavailability and inaccurate dosages; however, every noted incidence of nonadherence to controlled pain medication was a result of dose errors. Controlled pain medication errors resulted in patients ingesting more than the prescribed amount in every case. Overuse of controlled pain medication is a serious, ongoing health issue in the United States.[20]

Nonadherence rates for antihypertensive, gastrointestinal, cholesterol lowering, and oral hypoglycemic medications are similar to other studies and reviews reporting chronic disease medication adherence. Successful interventions should include education for nonadherent participants because a patient may not readily detect physiologic changes resulting from not taking prescribed medications.[2]

Lack of access to medication was most frequently attributed to cost or the inability to come to appointments for prescription refills. These impediments to medication adherence may best be rectified through an interdisciplinary team approach, including pharmacists and team leaders. This allows all providers involved in the care of

the patient to have an updated and accurate list of the patient's medications.[16]

Limitations

The study only included 48 participants and was conducted within a short time span. In addition, the participants were recruited from a low-income clinic where patients are uninsured, which may increase the incidences of unavailability of medications.

CONCLUSIONS

The goal of this study was to improve the medication adherence in a low-income population without significant disruption of the current model of care. The BBMT demonstrated the ability to accurately identify medication nonadherence in patients as well as the health literacy gaps contributing to nonadherence incidences. Furthermore, the implementation of a brown bag review in a family practice setting allows direct comparison of medication versus verbalized recall by the patient. A brown bag review allows providers to have direct visualization of medication nonadherence with the potential to address medication errors. The brown bag review is an effective, safe, and feasible intervention in meeting health needs for patients.

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