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Christy J.W. Ledford

Uniformed Services University of the Health Sciences, Christian.ledford@usuhs.edu

Marc A. Childress

Fort Belvoir Community Hospital

Christopher C. Ledford

Fort Belvoir Community Hospital

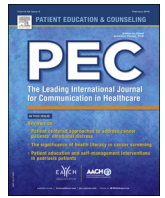
Heather D. Mundy

Fort Belvoir Community Hospital

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Ledford, Christy J.W.; Childress, Marc A.; Ledford, Christopher C.; and Mundy, Heather D., "The practice of prescribing: Discovering differences in what we tell patients about prescription medications" (2014). *Uniformed Services University of the Health Sciences*. 132. <http://digitalcommons.unl.edu/usuhs/132>

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Medication Information

The practice of prescribing: Discovering differences in what we tell patients about prescription medications[☆]Christy J.W. Ledford^{a,*}, Marc A. Childress^b, Christopher C. Ledford^b, Heather D. Mundy^b^a Department of Biomedical Informatics, Uniformed Services University of the Health Sciences, Bethesda, USA^b Department of Family Medicine, Fort Belvoir Community Hospital, Fort Belvoir, USA

ARTICLE INFO

Article history:

Received 28 March 2013

Received in revised form 26 August 2013

Accepted 5 October 2013

Keywords:

Prescription medication

Survey methodology

Patient-provider

ABSTRACT

Objective: This study explored patient recall of clinician presentation of information about prescription medication, looking specifically for communication patterns and differences by patient individual characteristics and by medication availability type.

Methods: A cross sectional survey collected information about 216 patients' perceptions of clinician presentations of medication information.

Results: Demographically, males recalled receiving more information about reasons, risks, and regimen in medication discussions. By medication type, patients reported receiving more medication information when the clinician presented a prescription-only medication as opposed to a medication that was also available over the counter.

Conclusion: Given the broad and unmonitored use of over-the-counter products, coupled with the increasing awareness of risks associated with many of these medications, it is concerning that patients report receiving less information about these products.

Practice implications: The emphasis on appropriate medication counseling should not be limited to medications available only by prescription. Prescribers should be mindful of these potential tendencies when discussing medications.

Published by Elsevier Ireland Ltd.

1. Introduction

Clinician counseling about medication can improve patient understanding of medication instructions and adherence to those instructions [1,2]. However these discussions can often be overlooked due to the routine and frequent nature of prescribing medicine. Research shows that during the average 15.9 min of a patient visit, only 49 s addressed factors regarding a new prescription [3]. In these discussions, as few as 33% of patients receive verbal counseling regarding the side effects of a new prescription [4], and patients who receive less counseling about new medication are less likely to adhere to medication regimens [5,6]. In addition to risk information, research supports presenting medication name, directions for use, reason for medication, and duration of use in medication prescription discussions [7–10]. Previous studies show that patient adherence to medication

instructions are determined proximally by their perceived need for the medication, their understanding/response to side effects, and the cost of the medication [11]. Distally, the clinician affects medication commitment and medication concerns through the prescription discussion [12].

While many physicians may defer appropriate counseling of these risks and effects to other resources, there is evidence that other means of patient education have less impact. Patients trust physicians and select them as their preferred source of health information [13,14], specifically prescription information [7,15]. In The Netherlands, one study showed that 66% of patients perceived the prescribing clinician to be the primary source of information about their medication [16]. Additionally, clinician counseling regarding risks generates higher patient awareness than pharmacist counseling or written educational materials [17]. Studies show that patients struggle with reading drug labels and provided instructions [18,19].

Previous research has shown these gaps in clinical practice regarding general medication discussions; however, it is not known if these gaps exist across medication types. Of particular interest here is whether the prescribed medication is also available in an over-the-counter (OTC) formula. Generally, due to the widespread use and easy availability, some OTC pain medications, such as nonsteroidal inflammatory drugs, are assumed by patients

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* Corresponding author at: 4301 Jones Bridge Road, G058D, Bethesda, MD 20814, USA. Tel.: +1 301 295 2158; fax: +1 301 295 3585.

E-mail address: Christian.Ledford@usuhs.edu (Christy J.W. Ledford).

Table 1
Risks, reasons, and regimen in medication discussions index (R³iMeDi).

Determinant	Item	Potential range ^a
Risks	The healthcare provider told me today about the <i>risks or side effects</i> of the medication	1–5
	The healthcare provider told me today about the <i>long-term safety</i> concerns of taking the prescribed medication.	1–5
Reasons	The healthcare provider explained the <i>reason</i> for prescribing this medication today.	1–5
	The healthcare clearly explained the <i>benefits</i> of my prescribed medication.	1–5
Regimen	The healthcare provider gave clear <i>instructions</i> on how to take the prescribed medication, such as how much and when.	1–5
	The healthcare provider explained what other medications could <i>interfere</i> with how this medication works.	1–5
R ³ iMeDi		6–30

^a Higher values indicate positive value.

to be benign [20,21]. In stark contrast to this widespread perception, there is robust evidence that these medications can carry clear and significant risks, to include gastrointestinal injury/bleeding, renal complications, and cardiovascular injury [22,23]. The morbidity and mortality impact of these effects is becoming better defined. In a European study, 30% of hospitalizations for adverse reactions to medications were related to NSAID use [24]. Multiple large studies have well described the degree of impact that these medications on the organ systems as described above, as well as serving to complicate numerous comorbidities, such as hypertension, congestive heart failure, and asthma [25,26]. However, multiple studies have shown that generally patients are not aware of these risks [21]. While this lack of awareness might be understandable with OTC formulations, it is more concerning that patients seem similarly uninformed about these risks when they are prescribed these medicines [27]. This study aims to explore if there are differences in how patients recall medication discussions they have with their clinicians when the clinician prescribes a prescription-strength formulation of an OTC medication.

This study explored patient recall of clinician presentation of information about new prescriptions, looking specifically for communication patterns and differences.

The following questions were examined in this study:

Research question 1: How do patient-reported medication discussions differ by patient characteristics (age, gender, education, and health status)?

Research question 2: How do patient-reported medication discussions differ by availability type (whether a prescribed medication is also available in an OTC formulation or not)?

2. Methods

This is a cross-sectional survey design. After receiving Institutional Review Board approval, a research station, manned by the first author and a research associate, was set up in the waiting room of a community hospital pharmacy in the metropolitan Washington, DC, area for two weeks in summer 2012. Screening was conducted verbally prior to consent and included three criteria: age greater than 18, had an appointment with their clinician, and was waiting for a new (not refill) prescription.

When volunteers met screening criteria, a research team member launched the survey on a tablet computer for the participant. For volunteers who were uncomfortable with the tablet, an identical paper-and-pencil version was available. Participants received a canvas bag as a participation incentive.

The primary outcome of interest was patient-reported recall of if the clinician presented the risks, reasons, and regimen in the new prescription medication discussion. This outcome was measured by an index that included six items intended to assess recall of the determinants of medication adherence, the risks, reasons, and

regimen in medication discussions index (R³iMeDi). Table 1 presents the individual items and representative determinants. The items were summed to create an index that ranged from 6 to 30, where high scores indicate positive discussion. When data was missing from one of the individual index items, the case was not included in index analyses, but was retained in individual item analyses.

These items were developed with the intent to assess the patient's recall of the clinician's information about the medication only, not the patient's cognitive representation of the prescribed medication or medication in general. However, the items here assess recall of information that can inform patient beliefs. Similar to the Beliefs about Medication Questionnaire subscales, the items here assess patient recall about how the clinician gave information that communicates the necessity of the specific medication and the concerns of the specific medication [28].

Principal component factor analysis with Varimax rotation was used to confirm the factor structure. The criterion for factor extraction was an Eigen value > 1.0.

For research question 1, individual level variables (age, gender, education, ethnicity, health status) were predictor variables. For research question 2, the predictor variable was medication type. The survey asked patients, "Did you receive a prescription today? If so, please list one." They were then prompted to respond to R³iMeDi items with the following prompt, "The following questions ask about the conversation you had with the healthcare provider about this medication he or she prescribed for you today." The second author coded patient-reported medication names by availability type: prescription that is also available in an over-the-counter version or available only as a prescription.

Two variables were included as potential covariates of medication discussions: communication satisfaction and patient activation. The adapted communication satisfaction scale [29] included four Likert-type items (measured 1–5) assessing patient perception of clinician communication behaviors including respect, listening, response to patient needs, and time to ask questions. Patient activation is a specific type of involvement in which patients recognize that they are responsible for their own care, which motivates them to seek health-related information and manage their own health [30]. For this study, patient activation was assessed with the licensed patient activation measure [31], which uses 13 Likert-type items to create a continuous patient activation measure on a scale of 0–100.

Participants also reported age, gender, ethnicity, education, overall health status [32], and clinic from which the medication was prescribed, to include family medicine, internal medicine, and other.

Quantitative analyses were conducted using the SPSS Version 19.0. Tests of statistical significance were set at a pre-determined alpha level of 0.05 (two-tailed). Relationships between continuous independent variables and recall were assessed with correlation testing. Relationships with nominal independent variables were

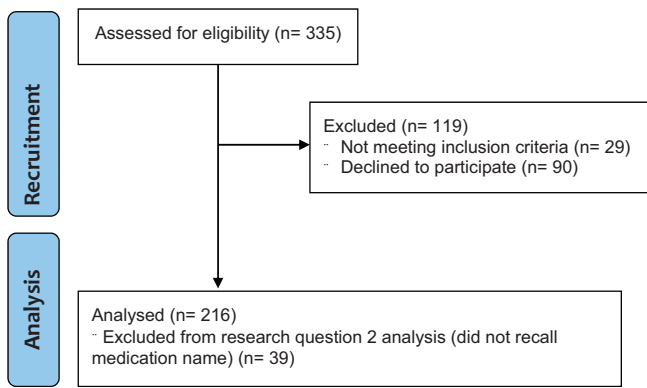


Fig. 1. Flow diagram of recruitment and participation.

assessed with analysis of covariance (ANCOVA). The covariate nature also allows for the statistical control of design-uncontrolled variables; included here are patient activation and communication satisfaction.

3. Results

Of 335 patients assessed for eligibility, 216 (64.48%) completed the survey. Fig. 1 presents a diagram of recruitment and participation. Table 2 presents sample characteristics.

The R³iMeDi index had strong internal reliability (Cronbach's $\alpha = 0.899$). Principal component factor analysis indicated unidimensionality of the index (a single dimension emerged, eigenvalue of 4.039, explaining 67.31% of the variance). The R³iMeDi mean was 23.92 (5.46). The communication satisfaction scale also had strong reliability ($\alpha = .950$). The mean was 4.47 (0.96), and the mean for patient activation was 73.77 (15.53).

3.1. Research question 1

At the individual level, there was not a difference in R³iMeDi by age, education, ethnicity, or health status. However, for gender differences, an analysis of covariance (ANCOVA), controlling for communication satisfaction and patient activation, showed that males recalled receiving more information in medication discussions ($M = 25.60$ (sd 0.62) than females ($M = 23.10$ (sd 0.42)), $F(1,$

184) = 11.14, $p < 0.001$, partial $\eta^2 = 0.06$. The covariates, patient activation, $F(1, 184) = 38.87$, $p < 0.001$, and communication satisfaction, $F(1, 184) = 8.86$, $p < 0.01$, also had a significant association with R³iMeDi.

To further explore differences, the ANCOVA was repeated on the six individual items. Males consistently reported receiving more information regarding side effects, long-term safety, reasons for medication, benefits of medication, and potential medication interactions. See Fig. 2 for estimated marginal means.

3.2. Research question 2

Only patients who were able to recall the name of the prescribed medication were included for analysis. Of the 216 patients who completed the survey, 177 (81.94%) were able to recall the name of the medication prescribed by the clinician. The group of patients who recalled the name of the medication was not significantly different than patients who did not recall medication name, by age, gender, ethnicity, health status, or patient activation. However, patients who listed the prescribed medication name reported a higher level of education than those who did not list a specific medication when prompted, $F(1, 213) = 7.77$, $p < 0.01$. Only patients who recalled medication name were included for analysis, to enable coding for medication type.

For research question 2, an ANCOVA was calculated with the independent variable medication types, and the covariates patient activation and communication satisfaction, as determinants of recall of information received. For availability type, 53 medications were also available over the counter and 103 were available only by prescription.

In the ANCOVA, the covariates patient activation, $F(1, 148) = 16.44$, $p < 0.001$, and communication satisfaction, $F(1, 148) = 7.57$, $p < 0.01$, again had a significant association with R³iMeDi. When controlling for these covariates, there was a significant relationship between availability type and R³iMeDi, $F(1, 148) = 12.27$, $p < 0.001$, partial $\eta^2 = 0.08$, in which patients recalled receiving more information when discussing prescription-only medication ($M = 24.82$ (sd 0.48)) as compared to medications that are also available over the counter ($M = 21.91$ (sd 0.68)).

To further explore differences within availability type, the ANCOVA was replicated with each of the six individual index items. In these analyses, discussion regarding medication risks and

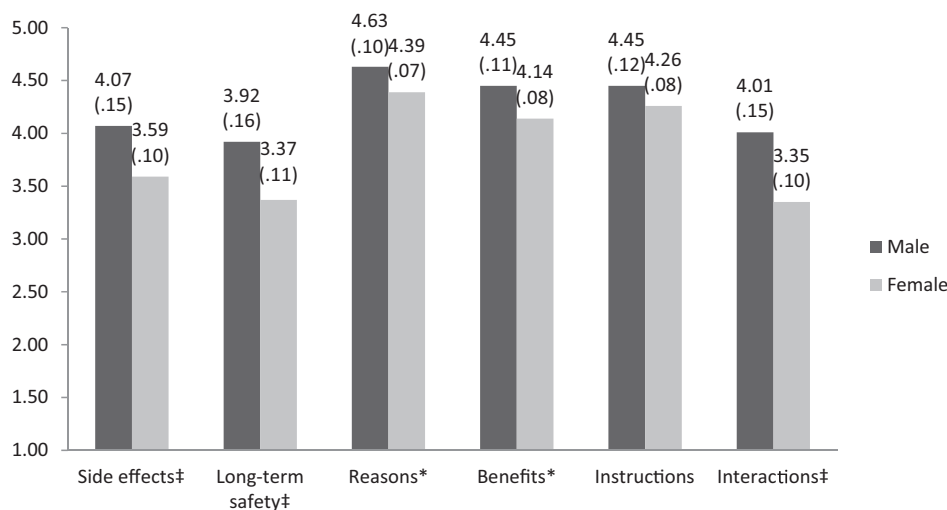


Fig. 2. Patient-reported index items of risks, reasons, and regimen in medication discussions index (R³iMeDi) by gender (estimated marginal means and standard errors). ‡ $p < 0.001$, * $p < 0.05$

Table 2
Sample characteristics (N=216).

		n	% of N
Gender	Female	150	30.6
	Male	66	69.4
Ethnicity	White/Caucasian	122	56.5
	Black or African-American	51	23.6
	Asian/South Pacific	15	6.9
	Hispanic	15	6.9
	Native American/Alaska Native	3	1.4
	Choose not to respond	10	4.7
Education	Less than high school	1	0.5
	High school or equivalent	15	6.9
	Some college, no degree	50	23.1
	Associate degree	32	14.8
	Bachelor's degree or more	117	54.2
Health status	Poor	6	2.8
	Fair	31	14.4
	Good	88	40.7
	Very good	72	33.3
	Excellent	19	8.8
Clinic seen	Family medicine	44	20.4
	Internal medicine	46	21.3
	Other	93	43.1
Age		Mean (s.d.) 48.35 (15.48)	

regimen remained significant by availability type. Patients recalled receiving more information for risks and regimen in discussions about medications available only by prescription. See Fig. 3 for estimated marginal means.

4. Discussion and conclusion

4.1. Discussion

The results provide insight into differences in patient recall of clinician communication patterns regarding new prescriptions. At the individual level, differences emerged by gender. Since this study controlled for communication satisfaction and patient activation, differences by gender do not appear to be a factor of involvement in healthcare or satisfaction with the clinician, which contradicts Street's proposition that active participation in a consultation can erase communicative behaviors arising from

gender stereotypes [33]. This finding may be interpreted as a result of the gendered approach to clinical communication in which males take an instrumental approach to the encounter, focusing on the biomedical issue, and thus may recall receipt of more information [34]. This is particularly salient in the context of medication prescription, which likely focuses on the biomedical context as opposed to clinical interactions that could address more psychosocial issues.

Another research finding that could affect this difference in perceived information receipt could be a result of the amount of information desired. Previous research shows that female patients received less information than they wanted from their clinician [35]. Results here may be attributed to women perceiving less medication information because of higher information needs. Clinicians need to assess patient expectations for medication information to ensure they are providing the level of information the patient wants.

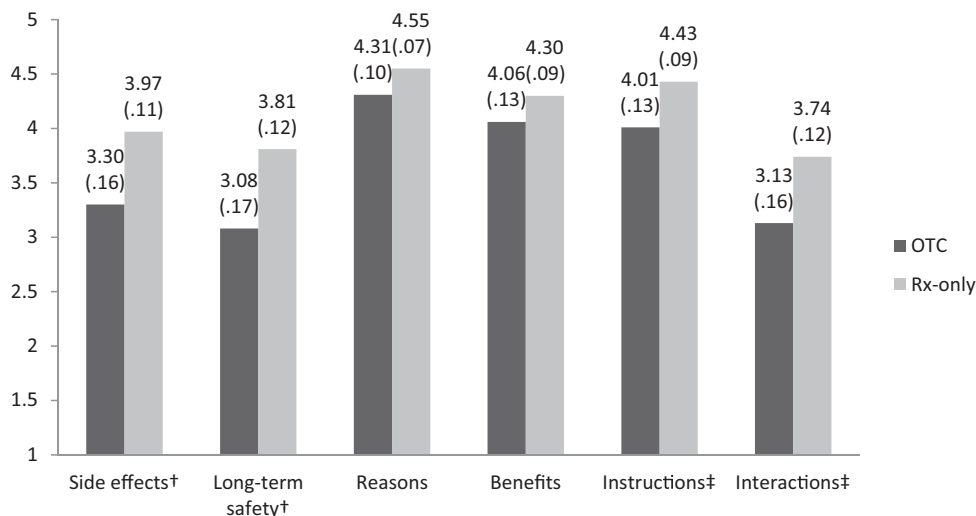


Fig. 3. Patient-reported index items of risks, reasons, and regimen in medication discussions index (R^3iMeDi) by availability type (estimated marginal means and standard errors). † $p < 0.001$, ‡ $p < 0.01$

When considering medication type, differences emerged in discussions about prescribed medications that are prescription only and those that are also available to patients over the counter. Significant differences were seen in 4 of 6 items of medication counseling quality. These differences persisted even when controls for variables of patient satisfaction with clinician communication and patient activation were introduced. These factors have been shown to impact the degree of retention of information [36], participation in decision making [37], and medication adherence [38]. To some degree, this difference with medications also available over the counter is not surprising. This may well reflect a general sense on the part of both clinicians and patients that for medications to be available over the counter, there is an intrinsic degree of safety that allows a more relaxed or minimized approach in discussing risks and side effects. This result is similar to research findings that discussions about dietary supplements are suboptimal regarding risk [39].

This investigation focused on the immediate patient perspective after receiving a new medication prescription. By collecting data in the pharmacy setting, the study leverages the time period in which a patient has been exposed to the clinician's information but not yet the pharmacist's input. This allows for more accurate recall of information delivered by the clinician, and minimizes potential confounding factors such as self-directed inquiry, pharmacist counseling, etc. A second strength to this study design is the approach to practice-based research in the pharmacy setting, wherein the population reflects a range of specialty and clinic types.

The study is limited by its reliance on self-reported data, allowing for potential self-selection and social desirability bias. Patient recall in self-report surveys continues to be a challenge; however, two-thirds of patients recall the information given upon prescription [6].

As there were not external measures of quality such as third-party review or clinician self-assessment applied to these discussions, it is challenging to determine the impact of these findings in a broader clinical sense. Future research could replicate study methods using a different measure of medication information such as the Satisfaction with Information about Medicines Scale [40], which includes the patient's perception of how much information he or she needs about the medication. Additionally, generalizability of results is limited by the single-site nature of this study.

In patient-level analyses, a potential confounder may have been the patient's perception of similarity with the doctor. Previous research has shown that when patients perceive the doctor to be similar to themselves they are more likely to be active participants, be more satisfied with care, express greater trust, and have a stronger intention to adhere to recommendations [41]. However, this study did not assess patient perception of clinician similarity. Another limitation, particularly regarding gender differences, is that this study did not record the gender of the clinician, which can also influence the communication interaction, particularly gender concordance [42].

4.2. Conclusion

Receiving initial risk messages from the clinician increases the potential for message repetition and retention through pharmacy and health educator interactions and materials [6,7]. The observed differences show a disparity in perceived medication discussions by gender and by medication availability, whether they are available by prescription only or are also available without a prescription. Given the broad and unmonitored use of OTC

products [43], coupled with the increasing awareness of risks associated with many of these medications [44–46] the switching from prescription to over-the-counter availability [47,48], and the potential for overuse [49,50], this finding is notable.

4.3. Practice implications

The emphasis on appropriate medication counseling should not be limited to medications available only by prescription. Prescribers should be mindful of these potential tendencies when discussing new medications. Results indicate a need for clinicians to present safety messages about OTC medication, including instructions, side effects, long-term safety, and potential interactions.

Conflict of interest

The authors have no conflict of interest to disclose.

Acknowledgement

The authors wish to acknowledge Lauren Cafferty for her tireless efforts in data collection.

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