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Medical Reconciliation of Dietary Supplements; Don't Ask, Don't Tell

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Abstract

Objective—To explore inpatient reconciliation of dietary supplement (DS) use and determine characteristics associated with DS documentation.

Methods—We analyzed DS use among 558 inpatients recruited from the Re-Engineered Discharge clinical trial to identify: 1) if patients self-reported DS and 2) if DS use was documented at admission. We examined socio-demographics for association with documentation using chi squares and t-tests. Logistic regression was performed to assess adjusted associations with DS documentation.

Results—Sixty percent reported DS use (n=333). Among users, 36% had admission DS documentation, 20% were asked about use at admission, 18% reported disclosing use to a provider, and 48% reported they would continue to use DS. Overall, 6% of participants were asked, disclosed, and had documentation of DS. Logistic regression revealed increased age associated with lower odds of DS documentation. Identifying as Hispanic or African American reduces DS documentation odds compared to those identifying as white.

Conclusions—There is lack of consistent DS medical reconciliation in the inpatient setting. While more than half of patients used DS prior to hospitalization, most were not asked about use on admission.

Practice Implications—This study adds to literature on medical reconciliation which requires that providers inquire and document patient DS use.

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Keywords

patient safety; continuity of care transition and discharge planning; adherence

Introduction

According to the 1994 Dietary Supplement Health and Education Act (DSHEA), a dietary supplement (DS) is intended to supplement the diet; and contains one or more dietary ingredients including vitamins, minerals, herbs or other botanicals, amino acids, and other substances or their constituents. Dietary supplement (DS) use remains prevalent in patient populations who are frequently hospitalized or at risk of hospitalization such as prescription medication users, those with chronic conditions, and the elderly.[1-4]

Specific patient populations, especially those hospitalized, may be more susceptible to drug-DS interactions or adverse reactions due to their acute or chronic illness. [5, 6] International studies have described DS use by hospitalized patients. For example, Goldstein et al reported on DS use in an Israeli hospitalized patient population. [7] They found that many clinicians overlook patient DS use. Clinicians with culturally sensitive language can improve DS history taking. [8] Inpatient socio-demographic and clinical factors associated with the presence of medical chart documentation of DS has not been determined. If clinicians are unaware of possible adverse reactions or if they do not document information about use in the medical chart, they may unknowingly provide a treatment plan or prescribe medications that have potential adverse reactions or interactions with DS. [9]

The Joint Commission, a non-profit organization that accredits and certifies health care organizations in the United States, defines medications as “any prescription medication, sample medication, herbal remedies, vitamins, nutraceuticals, over the counter drugs, used on or administered to person to diagnose, treat, or prevent disease or other abnormal conditions.”[10] The Joint Commission’s National Patient Safety Goal No. 8, Medical Reconciliation Act requires documentation of patient DS use and over-the-counter drugs, just like any other medication. Failure to document opens doors for potential complications due to either DS alone and/or interactions with prescription medications. These standards are meant to maintain safe and quality health care practices in health organizations throughout the country. Despite the Joint Commission’s standards, there is emerging evidence that rates of DS medical reconciliation are poor. [9, 11-13]

A study of the 2002 NHIS found that only one-third of patients disclosed their herb use to their physicians. [14, 15] Non-disclosure of DS is even higher among racial and ethnic minorities.[16] Barriers in medical encounters may not facilitate disclosure of DS use. Lack of DS disclosure, particularly of self-care practices among minority populations, represents a serious challenge for medical encounter communications. As the use of DS gains popularity among prescription medication users and patients with chronic conditions, there is concern that medical providers may miss diagnosis or make a medical prescribing error.

Additionally, little is known about patient provider communication about DS use among hospitalized prescription medication users and whether health care professionals are

correctly asking about, completing medical reconciliation and documenting DS, or discontinuing DS use in the inpatient setting. [7, 17] Young et al. reported on a sample of 177 U.S. inpatients, where 52% reported use of non-vitamin/non-mineral dietary supplements and 13% of patients reported that they believed there was nothing wrong with continued use of DS while hospitalized regardless of recommendations provided by inpatient physicians. During the admission process, physicians documented inquiring about DS use only 20% of the time. [17]

We performed an analysis of a cohort of low income racially diverse prescription medication users from the Re-Engineered discharge (RED) clinical trials. [18, 19] In this paper, we examined the prevalence of self-reported DS use and the extent to which clinicians inquired and documented DS use in an inpatient setting. Additionally, we explored if certain patient characteristics (age, race, gender, education) could be associated with DS documentation in the medical chart, which may provide information on which types of patients clinicians are addressing DS use with. This paper explores the communication practices between clinicians and hospitalized patients, clinician inpatient documentation practices, and the clinical and patient factors associated with DS documentation in the inpatient setting. Due to increasing literature about the necessity for accurate medical reconciliation of DS, we hypothesize that at least 50% of our study population will have documentation of DS use in their medical record.

Methods

Data Collection and Outcomes

The data for this analysis were collected by a trained research assistant at enrollment of the Re-Engineered Discharge (RED) clinical trials. [18, 19] The study tested a discharge care transition intervention designed for patients on the adult medicine services at Boston Medical Center (BMC), Boston, MA. BMC is an urban teaching hospital, providing care to an underserved, ethnically diverse population of patients. Patients 18 years of age and older and the ability to speak English were included. Patients were excluded if they were: admitted to BMC from a skilled nursing facility or other hospital, admitted for a planned hospitalization, or were on hospital precautions, on suicide watch, deaf, or blind. Data utilized for our analysis reflects baseline data before randomization occurred. This study was approved by the Boston Medical Center Institutional Review Board.

Socio-demographic, clinical, and DS use data were collected at enrollment. Socio-demographic variables included: age (18-29 years, 30-39, 40-49, 50-59, >60); sex; education level (less than high school, high school/equivalent, some college); race (Non-Hispanic Black, Non-Hispanic White, Hispanic/Other (Asian/Pacific Islanders, American Indians); income (none-\$9,999, \$10,000-\$29,999, \$30,000-\$49,999, >\$50,000, other/missing/refused); insurance status (private, government/free care); employment status (employed full or part time, disabled, retired); country of birth; homelessness in the last six months (yes or no). Clinical factors included the following: access to primary care provider on admission; Charlson comorbidity index [20]; depressive symptoms, measured with the Patient Health Questionnaire (PHQ-9) and dichotomized: no depressive symptoms, (PHQ score < 5); mild to severe depressive symptoms (PHQ score >5). [21]

Participants were asked the following questions about DS use by a research assistant at baseline data collection:

1. People take herbs, vitamins, minerals, and other non-vitamin supplements for a variety of reasons. By supplement we mean pills, capsules or tablets that have been labeled as a dietary supplement. Have you taken any herbal supplements in the past 12 months?
2. During your current stay, did a doctor or nurse ASK YOU about your use of herbal supplements?
3. During your stay, did you tell any doctor or nurse about your use of herbal supplements?
4. Will you continue to use your herbal supplements when you go home from the hospital?

Additionally participants were asked the exact same 4 questions about vitamins and minerals.

Medical reconciliation is completed on BMC inpatient units by resident or attending physicians. A review of the reconciled medication list from the medical chart on the admission history and physical was completed for all participants. Prescription medication and DS documentation was independently extracted by a trained research assistant (AF) and the PI (PG). To qualify as a prescription medication user, a participant had to have at least one prescribed medication on their admission history or physical (excluding eye drops, medical devices, or topical creams). We also looked at the number of prescription medications or over the counter medications on the medication list (count). The chart review process assessed documentation at a single point in time. Documentation on the medication list of at least one herb, vitamin, mineral, or other dietary supplement (e.g. fish oil, melatonin) indicated documentation of DS (dichotomous outcome).

Statistical Analysis

To assess correlates with DS documentation, we considered those who self-reported DS use. The DS variable reflects anyone who self-reported as a vitamin, mineral, or herb user. We considered the simple associations between DS documentation and several demographic and clinical factors using chi square tests and t-tests. Covariates were selected based on previous studies that demonstrated to predict DS use. [22, 23] Using variables with crude p-values of 0.2 or less and additionally the number of prescription medications, we created a multivariate logistic regression model. We assessed potential two-way interactions but none were statistically significant. Odds ratios and 95% profile confidence intervals are reported. All analyses were performed using SAS 9.3 (SAS Institute, Cary, NC).

Results

A comparison of baseline characteristics between those who were administered the DS questions and those that weren't revealed that frequent hospital utilizers, and those with lower health literacy were less likely to be asked about DS use. Otherwise, the samples of

those who were asked DS questions and those who were not were similar on sociodemographic, health behavior, and diagnosis-related characteristics.

Of the 802 total subjects, 581 completed questions on DS use. Of these, 558 were prescription medication users and were included in the analysis. Participants were 49% male, 50% non-Hispanic black, and 19% Hispanic/other (other races included Asian/Pacific Islander, American Indian, and unspecified races). Twenty percent had an education level of less than high school, 39% had a high school education. Fourteen percent reported being homeless, 56% had 4 to 11 medications, and 21% had 12 or more medications listed on their admission note (Table 1).

To better understand factors associated with DS use and documentation, we narrowed down the analysis to participants who self-reported DS use in the past 12 months (n=333, Table 1). Table 2 summarizes the characteristics of DS users (distinguishing behaviors associated with herbal supplements and vitamins/minerals) who had documentation of use, were asked about DS by the inpatient physician, would disclose their use if asked by a clinician, and would continue to use DS on discharge. Among DS users, 20% reported being asked about supplement use by a provider, 18% said they disclosed DS use to a provider, and 48% reported that they would continue to use their supplements after discharge.

While DS use was prevalent in our study population, only 21 self-reported DS users were asked about DS by their inpatient clinicians and had DS documentation in their medical record. In other words, 6% of the participants were asked, disclosed and had documentation DS.

To better understand the factors associated with DS documentation, we used multivariate logistic regression. The results of the model revealed that every additional year of age and being of Hispanic or other race compared to being non-Hispanic white significantly reduces the odds of having DS documentation [OR=0.979, 95% CI= (0.962, 0.997); OR=0.424, 95% CI= (0.185, 0.936), respectively]. (Table 3)

The intersection between self-reported DS use and documentation indicates that not only was there a lack of documentation for some patients who use DS, but there is also outdated documentation of DS for a number of patients who have discontinued their DS use. Figure 1 demonstrates the frequency of the medical documentation related to the patient clinician communication described in this entire population of the study (N=558).

Discussion

In our analysis of hospitalized prescription medication users who use a DS, 20% were asked about supplement use by a provider, 18% reported disclosing DS use to a provider, and 48% reported that they would continue to use their supplements on discharge. Although 36% had documentation in the medical chart, our study reports that the chance of documentation decreases with increasing age of the patient, and is lower among those identifying as Hispanic or other race. To our knowledge, we are the first to report on the factors associated with inpatient DS chart documentation. Our evidence for decreased likelihood of DS

documentation presents an opportunity for deeper examination of the nature of this problem and whether there are preventable adverse events that documentation would avoid.

Joint Commission standards require that all patients be asked about DS, and all those who report DS use should have proper medical reconciliation and documentation. These standards are meant to assist providers in recommending safe and appropriate therapies and avoiding DS-drug interactions and adverse events. Safety is at the forefront of patient care. Despite requirements for reconciled medication lists, there remains a discrepancy between what is listed in the medical record, and what patients use at home. [24]

In our cohort, 20% of patients taking DS reported being asked about their DS use by a provider. Our findings have been demonstrated in other hospital settings. Among patients in a general internal medicine and geriatric service, 75% reported that no physician asked about dietary supplement use during admission. [17] Research has indicated that many inpatient medical teams are unaware of patient's herbal remedies and dietary supplement use. [7] It is unclear whether this is from lack of inquiry about DS or lack of disclosure by the patient despite being asked. In one study, only 17% of patients reported that their primary care provider had asked about herb use. [25] Without the knowledge that a patient is taking a DS, providers may be unable to write an inpatient order for the patient to use a DS home supply, discharge a patient home with a reconciled medication list, and appropriate counsel patients on stopping or restarting a DS. [26, 27]

We found that 18% of those taking DS said they disclosed DS use to a provider. Estimates of patient disclosure of DS vary. For example, the 2007 National Health Interview Survey (NHIS) found that approximately 18% of the U.S. adult population used natural herbs or supplements in the past year, however only 45% informed their physician of their use. Less than 1% reported their herb use to their pharmacist. [28] In patients at a radiation oncology practice, 47% of those taking DS did not disclose use to providers. [29] Interestingly, in a study of hospitalized internal medicine patients, 74% of patients taking non-vitamin, non-mineral supplements disclosed their use to primary care providers, but only 23.7% disclosed their use to hospital staff. [30] Perhaps the trusting and consistent relationship found with a primary care provider may have contributed to a higher rate of disclosure compared to hospital providers.

Documentation of DS allows for coordinated, comprehensive care for patients managed by multiple providers. Our study found that 36% of supplement users had documentation of DS use in their medical record. This rate is higher than reported by Goldstein et al. (23%) in Israel and Young et al (20%) in North Carolina. [7, 17] However, only 21 (6%) of DS users noted being asked about DS by their inpatient clinicians and having DS documentation in their medical record.

In our multivariable analysis, DS documentation decreases as the age of the patient increases. This is concerning as the elderly are high consumers of DS, prescription medications, have well-documented poly-pharmacy interactions, increased sensitivity to certain drugs, and diminished metabolism of many drugs. [31] A study of 3,070 elderly patients found that 74% combined at least one prescription medication and one DS and 33%

were using three or more prescription medications with three or more DS. [3] Our findings are similar to outpatient elderly populations, for example a Danish study found that 74% of elderly patients were using over the counter medicines that were not listed in the medical record. [32] Cohen et al found that in a sample of 212 geriatric patients, 64% took supplements, but their use was documented in only 35% of medical charts. [9]

Our study also found that supplement documentation was lower among those who identify as Hispanic or of race other than white or African American. In a study of diabetic Hispanic women, 91% of women reported herb use; however only 6.7% of medical charts contained documentation of diabetes-specific herbs and 15.4% had documentation of general herb use. [33] In a study of older adults living on the United States-Mexico border, 31.5% of patients were at risk of having at least one DS-drug interaction. [34] Due to the high rates of herb use in Hispanic and Asian patients more research needs to be done to understand the factors such as language barrier or cultural stereotypes that are connected to this trend. [25, 35, 36]

Accurate medication reconciliation must include a thorough discussion regarding DS to prevent complications following discharge or hospital readmission. [37] Physician awareness of DS use is particularly relevant when planning care for discharging patients following hospitalization. In our study, 48% reported that they would continue to use their supplements on discharge. In a study of elderly patients recently discharged from the hospital, only 6.5% of patients adhered to the medication regimen as documented in the medical record while 78.2% reported taking an additional medication not listed in the medical record. [38] Jaski et al examined primary care practice procedures of reporting and documentation and found that less than half (47%) of physicians report reviewing herbal and other alternative treatments before prescribing a new therapy. [39] It is imperative for providers to have ongoing discussions about DS use with their patients especially post discharge to ensure that patients will be safe when they go home.

There are several limitations to our study. First, participation in the Re-Engineered Discharge clinical trial may have impacted results. Participants were English speaking patients, which limits our ability to get information from non-English speaking patients about their DS use. In addition, participants were only included if they agreed to be in a randomized controlled trial. Thus, these participants may differ from those who do not agree to participate in a randomized controlled trial. Furthermore, we were unable to capture the time between admission and the time the DS questions were asked. In addition, one weakness is the reliability of timing of use and self-reported DS use as some patients may have different definitions of DS that may not have been captured by the description provided by the research assistant. Another limitation is that prescription medication lists in the medical record may not be complete. We do not know if patients and clinicians talked and it was not disclosed by the patient, or if a conversation occurred, but that the patient doesn't recall a conversation. In addition, while we only assess interactions with nurses and physicians, we are unable to know whether inpatients had conversations with other health professionals during hospitalization such as a pharmacist. We are also unable to assess whether patients disclosed their DS use to a primary care provider.

Conclusions and Practice Implications

Hospitalized patients frequently use DS and despite whether they self-report or a physician asks him or her directly, failure to document infringes on Joint Commission standards, and also opens the door for adverse reactions. More research is needed to assess how many adverse reactions are attributed to failure to medically reconcile patient DS use. Communication barriers also contribute to provider-patient conversations about complementary medicine in general. [40] The quality of provider-patient discussions depend on a variety of factors including provider comfort and knowledge of dietary supplements, as well as patient comfort discussing such therapies with the provider. Studies have shown that if there is more patient participation in health decisions, patients are more open to telling providers about use. [41] Providers must be aware of DS use, as they may unknowingly recommend a therapeutic regimen that may be contraindicated with a product that a patient is taking. It is important for providers to facilitate honest discussions to allow for the best care.

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Highlights

- Dietary supplement (DS) use remains prevalent in hospitalized patient populations.
- Accurate medication reconciliation includes a discussion of patient DS use.
- We examine the prevalence of self-reported DS use and clinician inquiry into DS use.
- We report on the factors associated with inpatient DS chart documentation.

Figure 1.

Frequency of Communication and Chart Documentation of Dietary Supplement Use in the past 12 months in Hospitalized Patients

*37 individuals were unsure whether they were asked about DS use by an inpatient team member, thus they are excluded from this figure

** confirmed by Research Assistant delivered baseline interview

Table 1
Characteristics for prescription medication users, dietary supplement users (DS), and if they had documentation in the medical record of herb and dietary supplement use

Participant Characteristics	Rx Users (N=558)	Self-Reported DS Users (N=333)	Documentation of DS (N=119)
Age			
18-29	53(10)	38(11)	20(53)
30-39	68(12)	43(13)	13(30)
40-49	156(28)	90(27)	34(38)
50-59	154(28)	82(25)	28(34)
60	127(23)	80(24)	24(30)
Gender			
Male	276(49)	160(48)	58(36)
Female	282(51)	173(52)	61(35)
Education			
Less than HS	112(20)	69(21)	23(33)
HS or equivalent	213(39)	124(37)	42(34)
College	221(40)	133(40)	52(39)
Race			
Non- Hispanic Black	278(50)	178(53)	17(27)
Hispanic Other	107(19)	63(19)	64(36)
Non- Hispanic White	172(31)	92(28)	38(41)
Income			
None to \$10,000	124(22)	80(24)	46(39)
\$10,001-\$30,000	121(22)	73(22)	31(39)
\$30,001-\$50,000	48(9)	32(10)	20(27)
\$50,001 +	59(11)	30(9)	10(31)
Other/ Missing/Unknown	206(37)	118(35)	12(40)
Insurance			
Private	184(33)	110(33)	44(40)
Government/Free Care	374(67)	223(67)	75(34)
Born in the USA			
Yes	434 (78)	251(75)	94(37)
No	124(22)	82(25)	25(31)
Has primary care provider			
Yes	455 (82)	273(82)	103(38)
No	103 (18)	60(18)	16(27)
Depressive Symptoms (PHQ-9)			
No	412(78.48)	245(74)	90(37)
Mild-Severe	113(21.52)	73(22)	26(36)

Participant Characteristics	Rx Users (N=558)	Self-Reported DS Users (N=333)	Documentation of DS (N=119)
Been Homeless			
Yes	79 (14)	43(13)	9(21)
No	479(86)	290(87)	110(38)
Number of Prescription Medications: mean (St. dev.)	7.78(5.21)	7.91(5.37)	8.10(5.46)
Charlson Score: mean (St. dev.)	1.68(1.89)	1.87(1.95)	1.66(1.71)

Table 2

Among herb and dietary supplement users (n=333), documentation in the chart, asked by a health care professional about DS use, would disclose use to health care provider, and continue to use DS when discharged from hospital

	Any DS Use n=333(%)	Herb Use Only n=145(%)	Vitamin/mineral Use Only n=269(%)
Documentation of supplement use	119 (36)	52 (36)	94 (35)
Clinician asked about supplement use	65 (20)	7 (5)	81 (30)
Disclose supplement use to provider	59(18)	4 (3)	111 (41)
Will continue supplement use when discharged from hospital	149 (48)	24(17)	237 (88)

Table 3
Multivariable Logistic Regression for Documentation of Dietary Supplements With
Profile-Likelihood Confidence Limits

Predictor	Odds Ratio	95% Confidence Limits		p-value
Age (years)	0.979	0.962	0.997	0.021
Gender: Males vs. Females	1.207	0.709	2.062	0.4876
Education:				
High School or Equivalent vs. College	0.970	0.550	1.711	0.3908
Less than High School vs. College	0.583	0.277	1.187	0.1258
Race:				
Hispanic/Other vs. Non-Hispanic White	0.424	0.185	0.936	0.0445
Non-Hispanic Black vs. Non-Hispanic White	0.775	0.432	1.391	0.5149
Has PCP: Yes vs. No	1.633	0.812	3.413	0.1782
Been Homeless: Yes vs. No	0.480	0.200	1.058	0.0809
Number of Prescription Medications (per increase in one medication)	1.028	0.981	1.077	0.2492