ORIGINAL RESEARCH

Factors influencing the exit knowledge of patients for dispensed drugs at outpatient pharmacy of Hiwot Fana Specialized University Hospital, Eastern Ethiopia

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Background: A satisfactory counseling process between the patient and pharmacist is critical for rational use of dispensed drug(s) and is highly influenced by many factors including the experience of pharmacist in dispensing process. To improve patients' knowledge of dispensed drugs, it is necessary to understand the factors that optimize a pharmacist interaction with a patient in each activity of the dispensing process. Therefore, the aim of this study was to identify the pharmacist and patient factors that influence knowledge of dispensed drugs by ambulatory patients at Hiwot Fana Specialized University Hospital, Harar, Ethiopia.

Materials and methods: A cross-sectional study was conducted on 422 respondents. Data were collected by interviews using a structured questionnaire that measures "exit knowledge" of the ambulatory patients for dispensed drugs. The collected data were analyzed using SPSS Version 20.0. Potential covariates were identified using χ^2 test, and logistic regression analyses were undertaken to adjust for the covariates.

Results: Our findings showed significant proportions of the patients did not recall the name of their dispensed medication (53.6%), major side effects (66.4%), and what to do in case of missed doses (65.4%). Patients' knowledge of dispensed drugs was significantly associated with their educational level (adjusted odds ratio [AOR]: 1.97; 95% confidence interval [CI]: 1.01–3.84 [primary], AOR: 2.04; 95% CI: 1.04–4.04 [secondary], and AOR: 2.71; 95% CI: 1.35–5.46 [tertiary]); clear instruction from the pharmacist (AOR: 3.36; 95% CI: 1.16–9.72); and the politeness of the pharmacist (AOR: 2.02; 95% CI: 1.04–4.04).

Conclusion: We found that the majority of patients poorly understood the name of the dispensed medication, side effects, and what to do in case of missed doses. In addition, the formal educational level of the patient, clear instruction from the pharmacist, and the politeness of pharmacist were the factors significantly associated with improved exit knowledge of patients for dispensed drugs. Therefore, increased communication skills training for pharmacists would optimize patient–pharmacist interaction, which in turn would likely improve exit knowledge of ambulatory patients for dispensed drugs.

Keywords: counseling quality, patient knowledge of dispensed drugs, factors associated

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Introduction

Drug use is effective when patients receive the appropriate drug(s) in dose(s) correct to their own individual requirements, for an optimum period of time, and at the lowest cost both to them and the community.[1] A multidisciplinary collaboration is needed to develop, implement, and evaluate interventions that promote more rational

use of drug(s).[2] To this effect, the professional skills and experiences of pharmacists in dispensing processes greatly influence how medicines are used by ambulatory patients.[1,3] Similarly, the educational level and motivation of the patient are also critical factors in this regard.

The communication ability of pharmacists is one of the crucial professional skills needed for dispensing process, and this is highly important for satisfactory counseling that motivates patients toward rational drug use.[4] In line with this, for instance, the role of pharmacist counseling in preventing adverse drug events,[5] and expanded roles in optimizing service utilization, decreasing unnecessary costs, and supporting physicians' prescribing practices to produce the intended effects are also evidenced.[6] For successful accomplishment of such roles, the World Health Organization (WHO) requires the dispenser to be knowledgeable in the indications of medicines, their side effects, contraindications, and dosages for human use so that accurate information can be provided to patients, thereby improving their understanding of and adherence to treatments.[7] Therefore, the qualification level of the dispenser could influence knowledge score of patients in regard to the drugs dispensed.[8]

Moreover, adequate consultation time given for patients, both by physicians and the dispensing pharmacists, is critical for proper understanding of why and how medicines are to be taken, for what purpose and for how long they are to be taken.[7] In addition to the dispenser's or prescriber's role, the educational level and prescription experience of patients can affect their understanding about the drugs dispensed.[9] The quality of interaction between pharmacist and patient is also found to affect patients' knowledge about dispensed drugs and their satisfaction with the service provided by the pharmacist.[10] To make sure that patients understand the dosage regimen correctly and thereby increase their compliance with the correct regimen, average dispensing (counseling) time is critical.[11] Accordingly, there is a need to improve patients' knowledge of dispensed drugs[12] by addressing pharmacists' and patients' factors across nations in different geographic locations.

Therefore, the factors associated with improving the knowledge of patients for dispensed drugs need to be exhaustively identified in various cohorts of nations. In Ethiopia, studies that correlate factors associated with knowledge of patients in regard to dispensed drugs are limited. Therefore, this study tried to identify pharmacists' and patients' factors that influence "exit knowledge" of ambulatory patients for dispensed drugs at Hiwot Fana Specialized University Hospital (HFSUH), Harar town, Eastern Ethiopia.

Materials and methods
Study site and design
The study was conducted at the outpatient pharmacy of HFSUH in Harari Region, Harar town, Eastern Ethiopia, from February to June, 2016. A cross-sectional study design was employed to assess the exit knowledge of dispensed drugs by ambulatory patients at this pharmacy. The study was designed and powered to evaluate the key study outcome (knowledge of dispensed drugs by ambulatory patients) among 422 patients.

Study variables
Age, sex, level of education, and other sociodemographic and patient–pharmacist interaction characteristics were the independent variables considered. The exit knowledge status of ambulatory patients about their dispensed drugs was the outcome variable assessed by this study. A patient is considered knowledgeable if he/she correctly answers at least eight of the twelve questions that were meant to assess the patients' knowledge of dispensed drugs (Table 1).

Study participants
The source population for this study was all the patients who came to outpatient pharmacy of the HFSUH. All patients who came to the outpatient pharmacy during February to June 2016 were considered the study population for the study. Patients coming to the outpatient pharmacy and willing to be interviewed during the data collection period were considered for the study; while all severely sick patients and patients who received greater than three medications from the outpatient pharmacy were excluded since information recall and retention abilities of such individuals was thought to be affected by the disease condition and the number of medications dispensed to them, respectively. Since there was adequate number of patients who were coming for pharmaceutical services during the data collection period, a random sampling method was used to select the study participants. The sample size of the study participants was calculated by the use of single proportion formula. For the sample size calculation, α was taken as =0.05 (two-tailed), confidence level =95%, and proportion of exit knowledge for dispensed drugs at outpatient pharmacy =50%. Accordingly, 384 subjects were determined as a minimum sample size; and after adding 10% of the calculated sample size for possible noncontingency, the final sample size was determined to be 422 patients.

Data collection process
Data were collected by interviewing patients on exit from the outpatient pharmacy by using a structured interview

Table 1 Exit knowledge status of patients interviewed for dispensed medications at outpatient pharmacy of HFSUH, Harar, June 2016

Knowledge status	Frequency	%
Patient knows medication's name		
No	226	53.6
Yes	196	46.4
Patient knows medication's indication		
No	149	35.3
Yes	273	64.7
Patient knows medication's route of administration		
No	71	16.8
Yes	351	83.2
Patient knows duration of therapy		
No	186	44.1
Yes	236	55.9
Patient knows medication's frequency		
No	52	12.3
Yes	370	87.7
Patient knows drug interaction		
No	176	41.7
Yes	246	58.3
Patient knows medication's major side effects		
No	280	66.4
Yes	142	33.6
Patient knows instructions on how to use medication		
No	97	23.0
Yes	325	77.0
Patient knows what to do in cases of missed dose		
No	276	65.4
Yes	146	34.6
Patient knows medication's proper storage		
No	172	40.8
Yes	250	59.2
Patient understands medication's label		
No	107	25.4
Yes	315	74.6
Patient knows expected therapy outcome		
No	118	28.0
Yes	315	72.0
Overall exit knowledge status		
Sufficient knowledge (≥8 positive responses)	194	46.0
Not sufficient knowledge (<8 positive responses)	228	54.0

Abbreviation: HFSUH, Hiwot Fana Specialized University Hospital.

questionnaire. The questionnaire was designed in part using the WHO document of Management Science for Health and the Ethiopian Food, Medicine and Healthcare Administration and Control Authority parameters for good dispensing practices.[13,14] Information included in the interview questionnaire included details about age, sex, educational levels, occupational status, marital status, ethnicity, facility setting, interaction variables with pharmacy service providers, and knowledge variables for the dispensed drugs.

The structured interview questionnaire has two parts. The first part specifically addressed sociodemographics of patients, by collecting information on age, sex, educational levels, occupational status, marital status, and ethnicity. This part of the questionnaire also inquired information of interaction variables with pharmacy service providers. The second part of the questionnaire's focus was on patient knowledge regarding dispensed drugs. To assure the data quality during the study, the structured interview questionnaire was extensively piloted (pretested on 22 ambulatory patients who took their medication from outpatient pharmacy of Jugel Hospital) before implementation. The pretest data were utilized to modify and enhance the final questionnaire. Based on their competence and experience, two pharmacy professionals were recruited and trained for the data collection. The data collectors interviewed the patients, and the patients' responses were reviewed following each interview. In addition, to ensure consistent patient understanding of the interview questionnaire, the questionnaire was translated to Amharic and Afan Oromo languages, the primary languages spoken in the study region. The local language questionnaires were retranslated back into English to verify the accuracy of the original translations. Every day after data collection, each datum was also reviewed and checked for completeness by the supervisor and the principal investigator; and the necessary feedback was given to the data collectors on the next day. Moreover, before each interview, the study participants were also well oriented about the study topic, focusing on the main objectives and advantages of answering the questions honestly.

Statistical analysis

Data were entered into an Epi-info Version 3.5.1 (CDC, Atlanta, GA, USA) and analyzed by using Statistical Package for the Social Sciences (SPSS) Version 20.0 (IBM, Armonk, NY, USA). Percent and frequency were the descriptive statistics employed to summarize sociodemographic characteristics, the extent of interaction between the pharmacists and patients, and the knowledge status of patients for the dispensed drugs. A χ^2 test was employed to identify the potential covariates of exit knowledge for dispensed drugs at the outpatient pharmacy of HFSUH. The covariate with P-value less than 0.20 by bivariate analysis was retained for the subsequent multivariate analysis. Univariable and multivariable logistic regression analyses were conducted to establish associations between patient marital status, patient educational levels, perceived clarity of the pharmacist's voice, perceived politeness of the pharmacist, and

perceived simplicity of instruction given to each patient by the pharmacist and the outcome variable (exit knowledge of dispensed drugs by the patient). In all of the analyses, significance testing was conducted using two-sided P-values (P) and 95% confidence intervals (CIs). In all of the cases, P-value <0.05 was considered significant.

Ethical consideration

The ethical clearance and study approval was obtained from Haramaya University, College of Health and Medical Sciences, School of Pharmacy (SOP/874/02/2016). Permission to interview the study participants was obtained officially from the administrative office of the hospital. Verbal informed consent was obtained from each participant prior to the interview.

Results

In this study, 422 ambulatory patients were interviewed, and characteristics of the patients are summarized in Table 2. As shown in Table 2, the majority of the patients interviewed were female (59.2%), were aged 19–29 years (36%), were married (60.9%), had finished primary (26.8%)

Table 2 Sociodemographic and interaction characteristics of respondents at HFSUH, Harar, June 2016

Characteristics	Frequency	%
Sex		
Male	250	59.2
Female	172	40.8
Age (years)		
≤18	28	6.6
19–29	152	36.0
30–39	123	29.1
40–49	73	17.3
50–59	34	8.1
≥60	12	2.8
Marital status		
Single	136	32.2
Married	257	60.9
Divorced	17	4.0
Widowed	8	1.9
Separated	4	0.9
Educational status		
Illiterate	70	16.6
Can read and write	30	7.1
Primary	113	26.8
Secondary	116	27.5
Tertiary	93	22.0
Religion		
Muslim	233	55.2
Orthodox	130	30.8
Protestant	59	14.0

(*Continued*)

Table 2 (*Continued*)

Characteristics	Frequency	%
Occupation		
Farmer	103	24.4
Government employee	124	29.4
Merchant	58	13.7
Laborer	19	4.5
Private employee	19	4.5
Student	80	19.0
Housewife	17	4.0
Retirement	3	0.7
Ethnicity		
Oromo	237	56.2
Harari	34	8.1
Amhara	99	23.5
Tigrie	25	5.9
Somali	19	4.5
Other*	8	1.9
Residence		
Urban	266	63.0
Rural	156	37.0
Pharmacy visit frequency		
First time	70	16.6
Second time	130	30.8
Repeated times	222	52.6
Income per month (Birr)		
<724	151	40.5
≥724	251	59.5
Perceived interaction status with pharmacist rated by patient		
Poor	31	7.3
Fair	121	28.7
Good	270	64.0
Primary language communicated by patient		
Amharic	207	49.1
Afan Oromo	185	43.8
Adarigna	15	3.6
Somaligna	15	3.6
Perceived clearness of pharmacist's voice and tone		
Clear	352	83.4
Not clear	70	16.6
Perceived comfort of waiting area		
Not comfortable	41	9.7
Fairly comfortable	60	14.2
Comfortable	321	76.1
Perceived politeness of service provider		
Polite	355	84.1
Fairly polite	42	10.0
Impolite	25	5.90
Perceived clearness of the pharmacist's instruction for patient		
Clear	342	81.0
Fairly clear	43	10.2
Not clear	37	8.8
Perceived sufficiency of pharmacist's knowledge		
Enough	274	64.9
Not enough	99	23.5
Do not know	49	11.6

Note: Other* stands for Argoba, Gurage and other minor ethnic groups in the area.
Abbreviation: HFSUH, Hiwot Fana Specialized University Hospital.

or secondary (27.5%) levels of education, were Muslims (55.2%), belonged to the Oromo ethnic group (56.2%), and were urban dwellers (63%). Similarly, more than half of the patients were experienced outpatient pharmacy visitors (52.6%), and 76.1% of the patients perceived the waiting area to be comfortable. In addition, the majority of the patients interviewed perceived their interaction with the pharmacist to be positive. Specifically, 83.4%, 84.1%, 81%, and 64.9% of the patients' perception was positive for voice and tone of the pharmacist, pharmacist interaction with the patient, instruction of pharmacist received by the patient, and knowledge of the pharmacist, respectively.

The knowledge status of the patients interviewed on exit from the outpatient pharmacy of HFSUH was assessed and is summarized in Table 1. The majority of the patients recalled the following information about their dispensed medication: route of administration (83.2%), duration of therapy (55.9%), frequency of use (87.7%), drug interaction (58.3%), instruction on how to use (77%), proper storage (59.2%), and expected therapeutic outcome (72%). However, less than half of the patients were able to recall the name of the medication

(46.4%), the major side effects of the medication (33.6%), or what to do in cases of missed doses (34.6%). Overall, less than half (46%) of the ambulatory patients met the defined criteria regarding knowledge of their dispensed medication at the exit interview (that is at least eight positive responses out of the twelve knowledge questions).

To determine the factors associated with the knowledge of patients for dispensed drugs, regression analyses were made. The univariable regression analyses showed positive correlations between the knowledge of patients for dispensed drugs and a number of different variables (Table 3). Patients having attained primary (crude odds ratio [COR]: 2.37; 95% CI: 1.25–4.51), secondary (COR: 2.87; 95% CI: 1.51–5.45), and tertiary (COR: 3.55; 95% CI: 1.82–6.93) levels of education, who perceived the instructions received from the pharmacist as clear (COR: 4.09; 95% CI: 1.48–11.31), who perceived the behavior of pharmacist as polite (COR: 2.26; 95% CI: 1.28–3.96), and who perceived the voice and tone of pharmacist as clear (COR: 2.44; 95% CI: 1.39–4.27) demonstrated a greater knowledge of their dispensed drugs at exit from the outpatient pharmacy of HFSUH. Similarly, after

Table 3 Regression analysis for factors associated with exit knowledge of patients for dispensed drugs at outpatient pharmacy of HFSUH, Harar, June 2016

Variable	COR (95% CI)	*P*-values	AOR (95% CI)	*P*-values
Educational status of patient				
Illiterate	1		1	
Read and write	1.15 (0.45–2.95)	0.77	1.12 (0.42–2.95)	0.81
Primary	2.37 (1.25–4.51)	0.009	1.97 (1.01–3.84)	0.04*
Secondary	2.87 (1.51–5.45)	0.001	2.04 (1.04–4.04)	0.03*
Tertiary	3.55 (1.82–6.93)	<0.001	2.71 (1.35–5.46)	0.005*
Perceived clearness of instruction of pharmacist				
Not clear	1		1	
Fairly clear	4.04 (1.73–9.45)	0.001	2.25 (0.90–5.63)	0.08
Clear	4.09 (1.48–11.31)	0.007	3.36 (1.16–9.72)	0.04*
Perceived politeness of pharmacist				
Impolite	1		1	
Polite	2.26 (1.28–3.96)	0.005	2.02 (1.04–4.04)	0.04*
Marital status of patient				
Single	1		1	
Married	0.44 (0.28–0.67)	<0.001	0.53 (0.33–0.84)	0.007*
Divorced	0.27 (0.09–0.82)	0.02	0.41 (0.13–1.31)	0.13
Widowed	0.09 (0.01–0.78)	0.03	0.12 (0.01–1.04)	0.055
Separated	1.97 (0.20–19.50)	0.56	2.74 (0.26–28.4)	0.39
Perceived clarity of pharmacist's voice and tone				
Not clear	1		1	
Clear	2.44 (1.39–4.27)	0.002	1.77 (0.94–3.31)	0.07
Pharmacy visit frequency				
First time	1		1	
Second time	1.50 (0.83–2.70)	0.17	1.37 (0.72–2.62)	0.33
Repeated visit	1.25 (0.72–2.16)	0.42	1.14 (0.62–2.09)	0.66

Note: Asterisk (*) shows significant difference.
Abbreviations: AOR, adjusted odds ratio; CI, confidence interval; COR, crude odds ratio; HFSUH, Hiwot Fana Specialized University Hospital.

adjusting for covariates, multivariable analyses revealed a statistically significant association between the levels of education of the patients and their knowledge of dispensed drugs. That is, patients with primary (adjusted odds ratio [AOR]: 1.97; 95% CI: 1.01–3.84), secondary (AOR: 2.04; 95% CI: 1.04–4.04), and tertiary (AOR: 2.71; 95% CI: 1.35–5.46) levels of education had a significantly increased knowledge of the dispensed drugs compared to illiterate patients. Furthermore, clear instruction of pharmacist (AOR: 3.36; 95% CI: 1.16–9.72) and the polite character of pharmacist (AOR: 2.02; 95% CI: 1.04–4.04) also positively influenced the knowledge of the patients for the dispensed drugs compared to their respective reference category. However, the knowledge of dispensed drugs was significantly decreased among married patients (AOR: 0.53; 95% CI: 0.33–0.84) compared to patients who were single.

Discussion

This cross-sectional study found that different patient and pharmacist factors influence the exit knowledge status of the ambulatory patients. Educational background of patients, positive patient–pharmacist interaction, and marital status of patients were the major factors that influenced the exit knowledge of the patients for dispensed drugs at outpatient pharmacy of HFSUH. Specifically, the formal educational level of patients (primary, secondary, or tertiary); clear instruction of the pharmacist; and politeness of the pharmacist were the factors associated with increased exit knowledge of the ambulatory patients for dispensed drugs, but the knowledge was also low among the married patients.

This study indicates that exit knowledge of dispensed drugs by ambulatory patients shows an increasing trend across the levels of the patients' educational background. It was 1.97 times, 2.04 times, and 2.71 times more likely in patients with primary, secondary, and tertiary levels of education, respectively, compared to illiterate patients. In agreement to this finding, different studies report that educational level of a patient is positively linked to his/her knowledge for dispensed drugs and adherence to the drug treatment regimen.[9,15,16] Another study addressed the role of well-designed written information as a useful enhancement to professional consultation and advice,[17] leading to possible improvement in health knowledge and recall. However, written information will clearly only benefit educated patients rather than those who are illiterate. Given that approximately 23.7% of the patients interviewed at exit from outpatient pharmacy of the HFSUH had no formal education, this raises the question as to how to improve medication understanding

of such patients. To this end, some studies suggest that the use of different pictorial aids by prescribers and dispensers can improve recall and comprehension of illiterate patients and also increases adherence to their drug treatment.[18–20]

Clear instruction given to patient by pharmacist was also found to influence the likelihood that patients would acquire adequate knowledge of their dispensed drugs. This knowledge was 3.36 times and 2.02 times more likely in patients who perceived the pharmacist's instruction and interaction to be clear and polite, respectively, compared to patients who perceived the pharmacist's instruction and interaction as unclear and impolite. Supporting this finding, a number of different studies describe the effect of patient-centered instruction to better understand orientation for dispensed drug use.[10,21,22] Consistently, the provision of clear instructions and optimum positive interaction that can be achieved between pharmacists and their patients has been shown to emanate from the pharmacists' communication skill and use of motivational conversation.[23,24] Furthermore, effective interaction between the pharmacist and other health practitioners is important to achieve characteristic changes toward patient benefit.[25] Generally, practitioners collaborate with patients for their patients' health, and the success of this collaborative effort is dependent on the ability of their interaction in motivating the patient toward positive behaviors.[26] Moreover, several studies demonstrate the importance of pharmacist involvement in constant patient counseling to significantly improve patient knowledge and adherence for dispensed drug(s).[27–29] Therefore, it is unsurprising that these study results indicate that a pharmacist interacting with his/her patient through his/her polite and clear instruction is capable of positively influencing the exit knowledge of the patient for their dispensed drug(s).

In contrast to the educational background of the patient and the pharmacist–patient interaction factors, a negative association was found between marital status and exit knowledge of patients for their dispensed drugs. Compared to single patients, married patients were 0.53 times less likely to demonstrate adequate exit knowledge for dispensed drugs. One hypothesis is that the independent living of a single patient requires more self-responsibility and autonomy, thus a higher odds ratio in the single patients (AOR:1.0) in relation to the exit knowledge could be expected. However, in contrast to this finding, other studies have reported the role of family support or marital status in increasing adherence to dispensed medication.[30–32] Indirectly, the increased adherence to treatment could result from patients' understanding of the drugs dispensed to them. A report of no effect of

marital status on compliance to medication dispensed was also noted.[32] In addition, although not statistically significant, a study done in Italy revealed that married individuals showed greater nonadherence to medication (60%) compared to unmarried patients.[33] It is possible that the high proportion of married patients participating in this study (60.9%) introduced some bias into the study findings; however, still the direct relationship between marital status of patients and their exit knowledge status for dispensed drugs lacks clear explanation.

Study limitations

In this study, the authors tried to assess the exit knowledge of ambulatory patients for dispensed drugs, which is subjective to the information retention and recall ability of each patient. This could result into an underestimation of the knowledge measurement. However, since drug information retention ability of ambulatory patients was thought to be affected by the number of drugs dispensed to them, only those patients who received a less than or equal to three drugs from the outpatient pharmacy were assessed for the exit knowledge. Apart from the aforementioned limitation, patients who answered at least two-thirds of the knowledge questions were considered knowledgeable for the dispensed drugs, and this might have also resulted into underestimation of the knowledge status. Therefore, any interpretation of the findings in this study needs to be made in consideration of aforementioned limitations.

Conclusion

The current cross-sectional study found that the majority of the patients served at the outpatient pharmacy of HFSUH had poor understanding about the name of the dispensed drug(s), side effect(s), and what to do in case of missed dose(s). In addition, patient factors, such as educational status and marital status, and pharmacist factors, were the factors significantly associated with the exit knowledge of patients for dispensed drugs. Therefore, increasing educational coverage and standards across the community and improving communication skills training for pharmacists would likely optimize patient–pharmacist interaction, which in turn would improve exit knowledge of patients for dispensed drugs.

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Disclosure

The authors report no conflicts of interest in this work.

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