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ORIGINAL RESEARCH

Knowledge on Dispensed Medications and Its Determinants Among Patients Attending Outpatient Pharmacy at Chencha Primary Level Hospital, Southwest Ethiopia

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Background: According to World Health Organization (WHO) drug use indicators manual, the patients' knowledge on dispensed medication is a crucial patient care indicator. There is a dearth of studies about patients' knowledge of dispensed medication at the primary health care facility. The objective of this study was to assess the knowledge of dispensed medication and associated factors among patients attending in the outpatient pharmacy of Chencha primary level hospital, Southwest Ethiopia.

Methods: A facility-based cross-sectional study was employed among 403 patients attending in the outpatient pharmacy of Chencha primary level hospital. The data collection techniques were observation of dispensing process and face-to-face interview by using WHO patient care indicators and a structured questionnaire, respectively. Descriptive statistics, univariable and multivariable logistic regression were determined using the SPSS version 20.

Results: A total of 403 patients participated which make the response rate 100%. Fifty-three (13.2%) patients had adequate knowledge on dispensed medication. The findings of multivariable logistic regression indicated that tertiary levels of education (AOR = 3.87; 95% CI [1.25, 11.96]), being private employee (AOR = 10.98; 95% CI [3.25, 37.04]), having severe perception of illness (AOR =3.77; 95% CI [1.43, 9.94]), having three or more visits (AOR =3.20; 95% CI [1.21, 8.44]) and being counseled by pharmacist (AOR = 10.02; 95% CI [4.45, 22.56]) significantly increased the odds of having a "adequate knowledge of medicines."

Conclusion: This study showed inadequate level of knowledge of dispensed medicine among patients attending in outpatient pharmacy of Chencha primary level hospital. Patient education, employment status, number of visits, perception of illness, dispenser qualification and experience were the factors for knowledge of dispensed medicine. Dispensers need into account patients' perception of their illness of illness and frequency of visits during counseling.

Keywords: medicine, knowledge, hospital, Ethiopia

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Background

According to the World Health Organization (WHO) drug use indicators manual, the patients' knowledge of dispensed medication is a crucial patient care indicator.[1] Pharmacy professionals are responsible for providing advice on the dosage, frequency, route of administration and side effects of medicines.[2] The patient should

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receive information about medicine identification (name), medicine dose, route of administration, frequency of administration, duration of therapy and possible side effect, among other information.[3,4]

In the assessment of patients' knowledge on dispensed medicines, the following are considered as important measurements for safe and effective medicine use; the name of the medicine; the medicine dose, the route of administration, the frequency of administration, the duration of treatment, the possible side effects and the storage condition of the medicine.[5–7] Patients' inadequate knowledge about the medicine they use may probably lead to incorrect use, thus causing treatment failure. Lack of information on dispensed medications may also cause unintentional overdose and non-adherence.[8]

According to WHO, over 50% of all medicines globally are prescribed incorrectly and 50% of the patients are incapable to use them appropriately.[9] Studies conducted among patients in Sri Lanka,[10] Ghana[11] and Eastern Ethiopia[12,13] revealed that a low level of knowledge of dispensed medications. Numerous studies have been done to determine patients' knowledge on dispensed medications.[5–7,10–13] However, most studies considered only one medicine per prescription to assess patients' knowledge level. In Ethiopia, there are limited studies conducted at primary hospital level. However, factors related to knowledge level have not been well explored in the country.

Our study aims to fill the gaps in the literature by responding to the following research questions: 1) what is the level of knowledge of dispensed medications among patients attending in the outpatient (OP) pharmacy of Chencha primary level hospital, southwest Ethiopia; and 2) what are the predictors associated with adequate knowledge level among patients attending in the outpatient pharmacy of Chencha primary level hospital, southwest Ethiopia.

Methods

Study Design and Period

We designed a hospital-based cross-sectional study to examine the exit knowledge of dispensed medications among patients attending in outpatient pharmacy of Chencha Primary Level Hospital, southwest Ethiopia. The current study was conducted between August 7 and December 12, 2019.

Study Setting

Chencha primary hospital is located in Chencha Town; Southwest of Ethiopia at 505kms from the capital city of the country (Addis Ababa). The town consisted of one primary level hospital and two health centers. The primary hospital is serving up to 100,000 people as per the three-tier system of the country Ministry of Health (MoH). The hospital has more than 28,503 outpatients visiting in a year.

Source and Study Population

Our source populations were all patients who had their prescription filled at the OP pharmacy of Chencha primary level hospital, while those patients who had their orders filled at the outpatient pharmacy of the hospital during the data collection period was taken as a study population.

Inclusion Criteria

Patients aged ≥ 18 years who had their prescription filled at the outpatient pharmacy of the hospital were included in the study.

Exclusion Criteria

Patients who were unable to speak and had known mental disorders were excluded from the study.

Sample Size and Sampling Procedure

The sample size was computed by using single population proportion formula $\frac{[(Z\alpha/2)^2 \times p(1-p)]}{d^2}$ with the assumption of 95% level of confidence interval, 5% margin of error, 50% of patients had adequate knowledge on dispensed medicines, and 5% for possible no-response was taken to determine a final sample size of 403. According to the hospital record office, the average daily client flow to the outpatient pharmacy estimated to be about 78. Thus; the total number of patients who will visit the OP pharmacy during the one-month study period was computed. The number of patients to be interviewed per day during the 30 days of data collection was estimated to be 13. By dividing the daily patients visit with the number of patients to be surveyed per day, every sixth patients available at the OP pharmacy during the one-month data collection period was included by using systematic random sampling technique.

Data Collection Tool and Procedure

The data collection techniques were observation of dispensing process and face-to-face interview by using WHO patient care form and a structured questionnaire, respectively (Supplementary file1). Patient care indicators are indicators that address key aspects of what patients'

experience at health care facilities. It includes consultation time, dispensing time, number of medicine actually dispensed, labeling and knowledge on dispensed medicine.[1]

A questionnaire was first developed in English and the translated to Amharic, the local language, and then retranslated to English to make sure the consistency of the questionnaire. A pre-test was done at Grese primary level hospital, southwest Ethiopia, and amendments were made based on the results. Six BSc and one MSc degree graduate pharmacists who were working at Arbaminch secondary level hospital were recruited for data collection and supervision, respectively. Three days of training about research ethics and data collection procedures was given for supervisor and data collectors. The supervisor and investigators watched the data collection throughout the process.

Observation of Counseling

Every six patient interval the dispensing sessions were observed, after patients' informed consent. A standard patient care indicator form was used to collect data relating to the patient care indicators (dispensing time, number of medicine prescribed and number of medicine actually dispensed).[1] The data collectors gave unique identification card to patient. Trained data collectors with pharmacy backgrounds observed dispensing process, measuring the dispensing time, number of medicine prescribed and number of medicine actually dispensed with a standardized WHO patient care form. To reduce observer bias, observers (data collectors) were taught not to interfere with the dispensing process.

Exit Interview

After the observation, patients were given a card with an identification number to forward to the data collectors outside the dispensing room (Figure 1). The exit interviews were conducted at a suitable place within the hospital premises, and away from dispensary and other patients visiting the outpatient pharmacy. A pre-tested a structured interview guide was used, which consisted questions on socio-demographic information, health related characteristics and knowledge of dispensed medicines. This questionnaire was adopted from previous researches[5–7,10,11,14,15] and modified to fit the present study.

The section focused on knowledge of patients contained nine items (name of medicine, dosage, frequency of administration, route of administration, duration of treatment, possible adverse effect, any interaction with other medicines or foods, storage condition of medicine and what to do if one or dosage were missed). For each knowledge item, if participants gave correct response, they scored 1 point; if a wrong response (incorrect) was given, the score for the items was 0. The name of the medicine was considered right when pronounced correctly. The dose was considered right when there was similarity between the patient answer and the amount to be administered at each time (from the prescription). Similarly, other responses to knowledge questions were recorded and compared to the prescription. Items not expresses in the prescription were checked based on the national medicine formulary and standard treatment guideline.

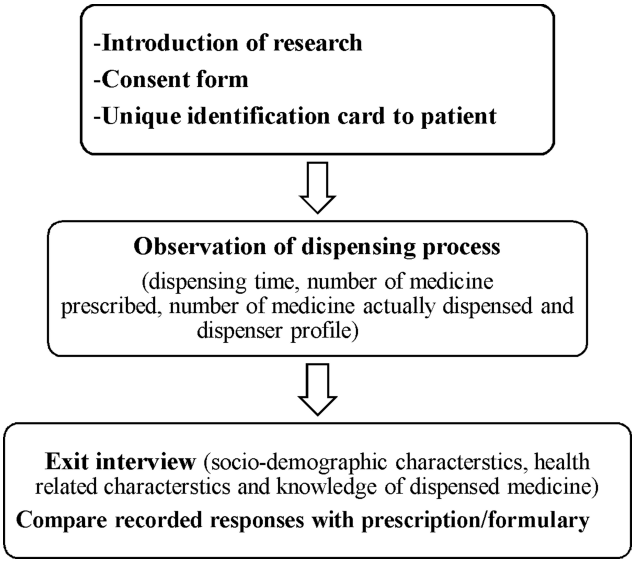

Figure 1 Flow chart of data collection process.

Study Variables

Independent Variables

Respondents variables used in the analysis were age, sex, marital status, educational level, residence, employment status, payment status, perceived severity of illness, service sought for, number of visit (during the last 12 months) and perceived language clarity. Dispensing process related variables used in the analysis were dispenser qualification, dispenser work experience, dispensing time and number of medicine dispensed.

Dependent Variable

Respondents level of knowledge on dispensed medication.

Data Processing and Analysis

Each knowledge item was weighted, according to the importance for safe medicine use. Crucial information for

the patient to identify and administer the medicine received greater scores. If the patient correctly knew the name of the medicine (Q_1), the medicine doses (Q_2), the route of administration (Q_3) and frequency of administration (Q_4), 20 points were attributed for each. Medicine information not directly linked to medicine administration, which could however; be important for adherence to treatment, received lesser scores.

A total of 10 points were attributed for each if the patient knew the duration of treatment (Q_5), possible adverse effect (Q_6), and any interaction with other medicines or foods (Q_7), storage condition of medicine (Q_8) and what to do if one or dosage were missed (Q_9). When computing the total score for each item the total number of medicines that the particular patient has been dispensed was also considered. For instance, a respondent who has been dispensed 2 medicines and exactly knows the dose of one medicine, the mark was computed as follows: $\frac{(1\text{medicine}*20\text{marks})}{2\text{medicines}} = 10\text{marks}$. The total knowledge score was obtained by sum up right reposes and considering weights.

$$\text{Knowledge score} = (Q1 + Q2 + Q3 + Q4) \times 20 + (Q5 + Q6 + Q7 + Q8 + Q9) \times 10$$

Total scores thus varied from 0 to 130 points. Knowledge level was classified based on related literatures.[5,7,10] Then; we set a score to determine the status of respondents' knowledge of medicines. Respondents with scores ranging from 110 to 130 were considered to have adequate knowledge. Respondents with scores ranging from 0 to 109 points were considered to have inadequate knowledge level. The adequate level, corresponding to at least 110 points, implied that all essential questions and at least three less essential questions were answered correctly.

Data were entered into Epi-Data version 3.1, then, it was exported into SPSS version 20.0 for analysis. We used different frequency tables and descriptive reviews to describe the research variables. Mean along with Standard Deviation (SD) to normally distributed continuous variables. We used univariable logistic regression to select potential predictors for the full model (with cutoff point p-value ≤0.25).[16] We checked instability of beta-coefficient (multicollinearity) for independent variables in the final fitted model via variance inflation factor (VIF) with cutoff point mean VIF>10.[17] Multivariable logistic regression analysis was carried out to estimate the independent effect of predicators on medicine knowledge. Over all goodness of fit of the final model was checked by Hosmer and Lemeshow chi-square test. Odd ratios (ORs) with 95% CIs were also calculated.

Results

Socio-Demographic and Health Related Characteristics of Respondents

In this research, 403 patients who had their prescription filled at the outpatient pharmacy participated with a response proportion of 100%. Most of the study participants were male (66.3%). The mean age of participants was 35.9 years (Standard deviation ±13.6). One hundred ten (29.8%) study participants were found in the age category of 25–34 years. More than three-quarters of the participants were married (73.9%) living in the urban area (55.6%).

Regarding educational status, 116 (30%) participants attended primary education (1–8 grade). Twenty-two percent of the respondents were government employed, 32% were farmer, 25.3% were jobless and 9.9% were private employed by the occupational status. Majority of participants received medication for themselves (81.1%). The majority (66.5%) of participants received their medicines on cash. The majority of respondents (44.9%) had visited the outpatient pharmacy more than two visits. More than five in ten (58.8%) of the patients reported that they were counseled in the language they do not easily understand (not clear) (Table 1).

Dispenser Profiles and Observed Dispenser Practices During Counseling of Medicines

More than five in ten (56.1%) of the respondents received their prescribed medicines from the pharmacist. More than half of the participants (57.2%) were served by a dispenser who had less than four years of work experience. The average dispensing time was 110 seconds (±67.4 standard deviation). The average number of medicines per encounter was 1.86 (±0.89 standard deviation). The vast majority of participants (78.7%) were received less than three medicines from the outpatient pharmacy (Table 2).

Knowledge on Dispensed Medication

Overall respondents' knowledge on dispensed medicine was measured based on the right response using nine dispensed medicine knowledge questions and the question was scored according to the importance of safe medicine use. The average scores for each crucial component of

Table 1 Socio-Demographic and Health Related Characteristics of Patients (n=403)

Characteristics	n	%
Sex		
Male	267	66.3
Female	136	33.7
Age		
18–24	92	22.8
25–34	120	29.8
35–44	95	23.6
≥45	96	23.8
Marital status		
Single	105	26.1
Married	298	73.9
Education level of respondents		
No formal education	115	28.5
Primary education	121	30.0
Secondary education	91	22.6
Higher education	76	18.9
Resident of respondents		
Rural	179	44.4
Urban	224	55.6
Employment status		
No job	102	25.3
Farmer	129	32.0
Merchant	43	10.7
Private employee	40	9.9
Government employee	89	22.1
Service sought for		
Self	327	81.1
Other	76	18.9
Payment status		
Free	135	33.5
Cash/credit	268	66.5
Number of visits		
First visit	106	26.3
Second visit	116	28.8
Third visit or more	181	44.9
Perception of severity of illness		
Mild	147	36.5
Moderate	115	28.5
Severe	141	35.0
Perceived language clarity		
Clear	166	41.2
Not clear	237	58.8

Table 2 Dispenser Profiles and Observed Dispenser Practices During Counseling of Medicines to Respondents in a Primary Hospital, Southwest Ethiopia, 2019 (n=403)

Characteristics	Number	Percentage, %
Dispensers' qualification		
Pharmacy technician	281	69.7
Pharmacist	122	30.3
Dispensers' working experience (years)		
0–3	305	75.7
≥4	98	24.3
Dispensing time		
<180 seconds	252	62.5
≥180 seconds	151	37.5
Average dispensing time(mean ± SD)	110 seconds (±67.4)	
Number of medicine dispensed		
<3 medicines	318	78.7
>2 medicines	85	21.0
Average number of medicine per encounter(mean ± SD)	1.86 (±0.89)	

medicine knowledge were; medicine name (out of 20) 5.2 ±4.6, frequency of administration (out of 20) 18.3±5.3, dose (out of 20)16.5±7.4 and route of medicine administration (out of 20) 19.6±2.9. For non-crucial items, medicine interaction 3.8 (out of 10), attitude toward missed dose 3.2 (out of ten), storage 5.8 (out of ten), side effect 1.34 (out of ten) and duration 7.1 (out of ten) (Figure 2A and B).

Respondents total knowledge score was dichotomized as adequate (110 points or more) or inadequate knowledge (109 points or less). The minimum and maximum scores of respondents were 20 and 120, respectively. More than three-quarter of respondents (86.8%) had inadequate level of knowledge on dispensed medicine. Fifty-three (13.2%) respondents had an adequate level of knowledge on dispensed medicine (Figure 3).

Factors Associated with Adequate Knowledge of Dispensed Medication

According to the univariable logistic regression analysis, patients' knowledge of dispensed medications was significantly associated with the educational level of respon-

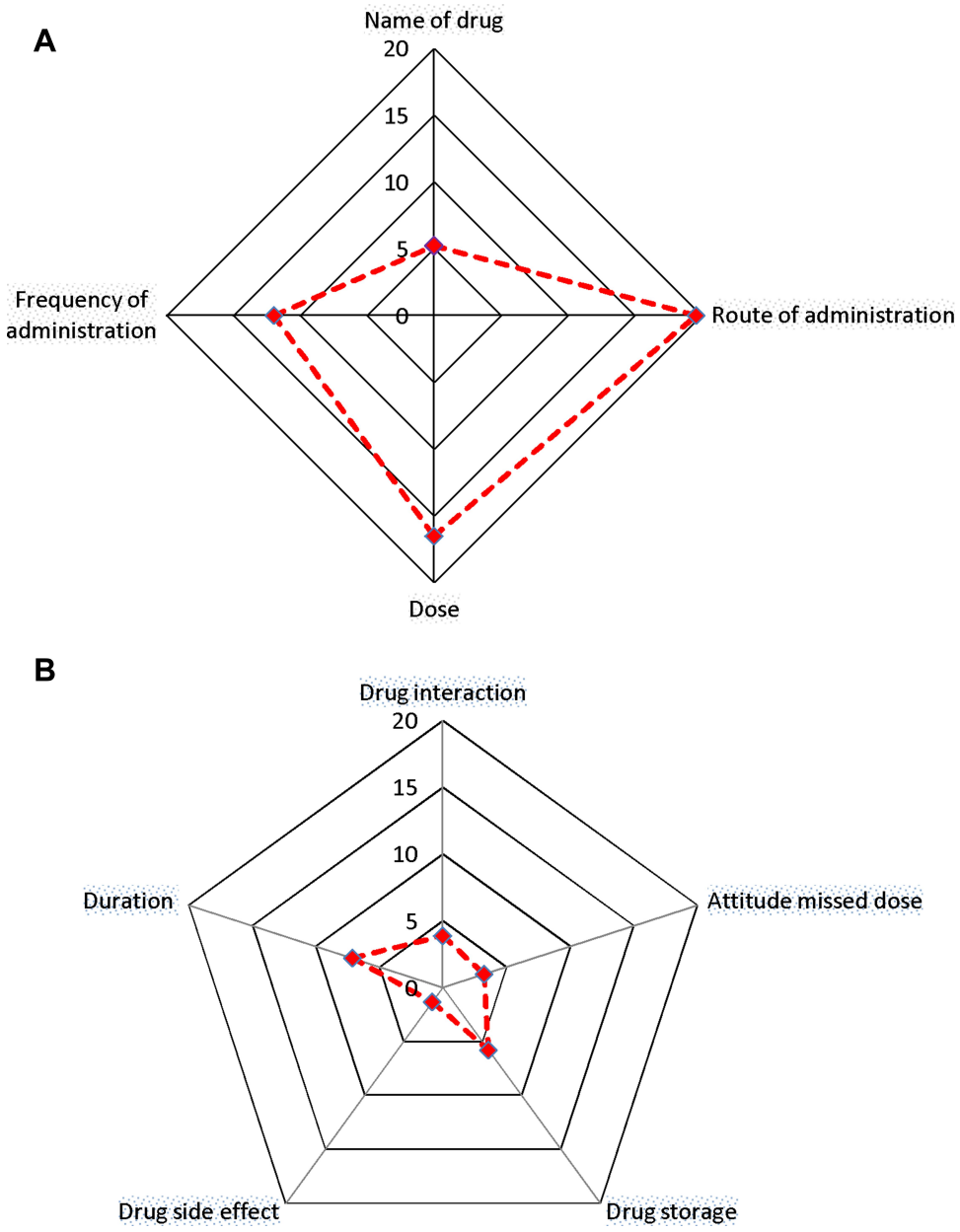

Figure 2 (**A**) The mean score of each crucial medicine information (out of 20). (**B**) The mean score of less crucial medicine information (out of 10).

dents, residence of respondents, occupational status, number of out-patient pharmacy visits, perceived severity of illness, perceived language clarity, dispensers work experience, dispensing time, and number of medicine received ($p<0.05$). Participants who attend higher education were 5.44 times more likely to have adequate knowledge of dispensed medication than participants did not have formal education (COR: 5.44;95% CI 2.36,12.53). Participants who were the employee of private were 6.13 times more likely to have adequate knowledge of dispensed medicine than unemployed (COR: 6.13; 95% CI 2.47, 15.22).

Respondents who were residing in the urban area were 2.02 times more likely to adequate knowledge of dispensed medicine than the rural area (COR=2.02 (95% CI 1.08–3.76). Participants who received medicine counseling for more than 180 seconds were more knowledgeable about dispensed medicine than those received for less than or equal to180 seconds (COR: 2.07; 95% CI 1.15,3.70). Perceived language clarity, dispenser's qualification and dispensers work experience were also significantly associated with adequate knowledge of dispensed medicine. However, age, marital status, service sought for

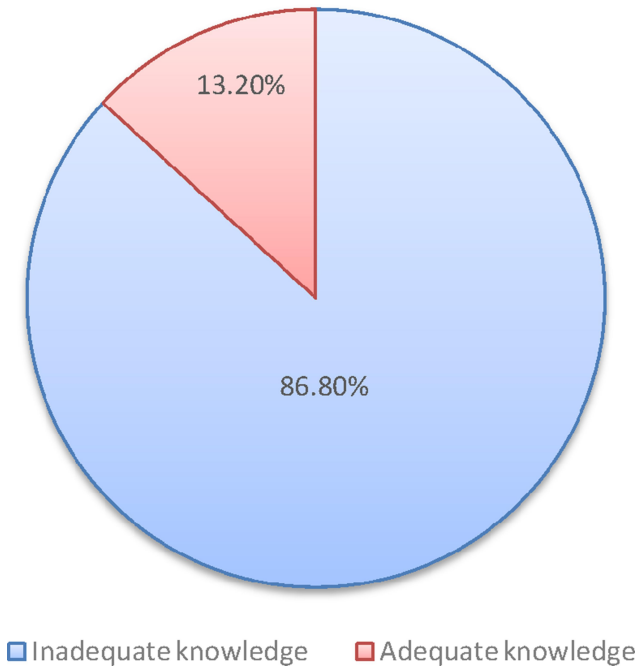

Figure 3 Patients level of knowledge on dispensed medication, primary hospital, 2019.

and payment status were not significantly associated with adequate knowledge of dispensed medicine (p>0.05) (Tables 3 and 4).

After adjusting for socio-demographic, socio-economic, perception toward the severity of illness, dispensing process and dispenser related factors; respondent's educational level, employment status, number of visits, perception of severity of illness, number of medicine dispensed, dispenser qualification and dispenser work experience were the predictors that significantly affect patients level of knowledge on dispensed medicine (p-value<0.05). The educational level of respondents was significantly associated with knowledge of dispensed medicine. Respondents who attend higher education were more likely to be well informed about dispensed medication as compared to respondents who cannot read and write (AOR: 3.87; 95% CI 1.25, 11.96).

Private employees had a significantly higher level of knowledge on dispensed medication compared to jobless (AOR 10.98; 95% CI 3.25, 37.04). Respondents who visited the outpatient pharmacy at least three times in last 12 months were more likely to understand dispensed medication than respondents who visited OPD pharmacy once (AOR 3.20, 95% CI 1.21, 8.44). Our study also indicates that perception of own illness as being severe (AOR 3.06; 95% CI 1.46, 6.43) significantly enlarged the odds of having "adequate knowledge of medicines". Adequate medicine knowledge was negatively associated to with "higher number of dispensed medicines" (AOR 0.20; 95% CI 0.06, 0.64).

Respondents who were served by pharmacists were about ten times more likely to have adequate knowledge of dispensed medicine compared to those served by pharmacy technicians (AOR:10.02; 95% CI 4.45, 22.56). Respondents who received medicine from experienced (≥4 years work experience) dispensers were 4.82 times more likely to understand their medication than those who received from less experienced dispensers (AOR: 4.82; 95% CI 2.13, 10.92) (Table 5).

Discussion

In the current study, knowledge on dispensed medications and its determinants among patients attending in the outpatient pharmacy of Chencha primary level hospital in southwest Ethiopia were investigated. Our study revealed that low prevalence of adequate knowledge of dispensed medicines among patients attending in outpatient pharmacy in southwest Ethiopia (13.2%). This result is consistent with the study conducted in Sri Lanka in which 17.5% of respondents had good knowledge of dispensed medications.[10]

The result of the current study was lower than the study conducted in Ghana in which the percentage of respondents who had adequate knowledge on dispensed medications was 31%.[18] This dissimilarity may due to the study setting difference, which means in our study, we conducted in a hospital setting whereas in the previous Ghana study, they conducted in a community pharmacy setting. This difference may also due to differences in the way we calculate medicine knowledge score is quite different. The Ghana study considered a respondent was knowledgeable if he/she recalls the name, amount, dosage, frequency, duration and route of administration of the last medicine received. However, in our study all essential medicine information's and at least three information not directly linked to medicine administration should be recalled by a respondent to say he/she has adequate knowledge on dispensed medicine. Moreover, our study considered all dispensed medications to compute the knowledge score.

Our finding is also lower than reports from Hiwot Fana Specialized University Hospital (HFSUH), Eastern Ethiopia (46%).[13] This might be due to the variation in inclusion criteria. The previous study (Eastern Ethiopia)

Table 3 Univariable Analysis of Socio-Demographic and Health Measurement Factors of Knowledge of Dispensed Medicines of Patients in a Primary Hospital, Southwest Ethiopia, 2019 (n=403)

Independent Variables	Adequate Knowledge (%)	Non-Adequate Knowledge (%)	COR (95% CI)	P-value
Sex				
Female	20(14.7)	116(85.3)	Ref.	0.510
Male	33(13.4)	234(87.6)	0.82(0.45–1.49)	
Age				
18–24	12(13)	80(87)	Ref.	
25–34	16(13.3)	104(86.7)	1.03(0.46–2.29)	0.951
35–44	13(13.7)	82(86.3)	1.06(0.45–2.45)	0.898
≥45	12(12.5)	84(87.5)	0.95(0.40–2.24)	0.911
Marital status				
Single	13(12.4)	92(87.6)	Ref.	0.786
Married	40(13.4)	258(86.6)	1.10(0.56–2.14)	
Education level				
Not able to read and write	9(7.8)	106(92.2)	1	
Primary education	8(6.6)	113(93.4)	0.90(0.32–2.24)	0.719
Secondary education	12(13.2)	79(86.8)	1.79(0.72–4.45)	0.211
Tertiary education	24(31.6)	52(68.4)	5.44(2.36–12.53)	0.000*
Resident of respondents				
Rural	16(8.9)	163(91.1)	Ref.	0.027*
Urban	37(16.5)	187(83.5)	2.02(1.08–3.76)	
Employment status				
No job	10(9.8)	92(90.2)	Ref.	
Farmer	7(5.4)	122(94.6)	0.53(0.19–1.44)	0.212
Merchant	8(18.6)	35(81.4)	2.10(0.77–5.76)	0.148
Private employee	16(40.0)	24(60.0)	6.13(2.47–15.22)	0.000*
Government employee	12(13.5)	77(86.5)	1.43(0.59–3.50)	0.429
Service sought for				
Self	45(13.8)	282(86.2)	Ref.	0.454
Other	8(10.5)	68(89.5)	0.74(0.33–1.64)	
Payment status				
Free	17(12.6)	118(87.4)	Ref.	0.814
Cash/credit	36(13.4)	232(86.6)	1.08(0.58–2.00)	
Number of visit				
First visit	8(7.5)	98(92.5)	Ref.	
Second visits	14(12.1)	102(87.9)	1.68(0.68–4.18)	0.264
Third or more visits	31(17.1)	150(82.9)	2.53(1.12–5.74)	0.026*
Perception of severity of illness				
Mild	11(7.5)	136(92.5)	Ref.	
Moderate	14(12.2)	101(87.8)	1.71(0.75–3.93)	0.204*
Severe	28(19.9)	113(80.1)	3.06(1.46–6.43)	0.003*
Perceived language clarity				
Not clear	17(7.2)	220(92.8)	Ref.	0.000*
Clear	36(21.7)	130(78.3)	3.58(1.93–6.64)	

Note: *Statistically significant at P-value below 0.05.
Abbreviations: COR, crude odds ratio; CI, confidence interval; Ref., reference.

Table 4 Univariable Analysis of Dispensers and Dispensing Process Related Factors of Dispensed Medicine Knowledge of Patients in a Primary Hospital, Southwest Ethiopia, 2019 (n=403)

Independent Variables	Adequate Knowledge (%)	Inadequate Knowledge (%)	COR (95% CI)	P-value
Dispenser qualification				
Pharmacy technician	15(5.3)	266(94.7)	Ref.	0.000*
Pharmacist	38(31.1)	84(68.9)	8.02(4.20–15.31)	
Dispenser work experience				
0–3 years	28(9.2)	277(90.8)	Ref.	
≥4 years	25(25.5)	73(74.5)	3.39(1.86–6.16)	0.000*
Dispensing time				
<180 seconds	25(9.9)	227(90.1)	Ref.	0.015*
≥180seconds	28(18.5)	123(81.5)	2.07(1.15–3.70)	
Number of medicine dispensed				
≤ 2 medicines	46(14.5)	272(85.5)	Ref.	0.136
>2 medicines	7(8.2)	78(91.8)	0.53(0.23–1.22)	

Note: *Statistically significant at P-value below 0.05.
Abbreviations: COR, crude odds ratio; CI, confidence interval; Ref., reference.

considered only patients who received less four medicines from the outpatient pharmacy whereas as in the current study all patients who received medication from the outpatient pharmacy were included. The current study considered all dispensed medications to the patient in order to calculate the knowledge score.

However, the previous study only considered one medicine per patient to compute the knowledge score. Similarly, it is lower than the result from study conducted in Easter Ethiopia in which 38.6% of respondents had good knowledge of dispensed medications.[12] Our finding was lower than the study conducted in North West Ethiopia in which the percentage of patients who had good knowledge of dispensed medicines was 38.3%.[19] These variations could also result from the variation in methodology (knowledge scoring) and study setting.

Respondent educational level was identified as a factor for knowledge of dispensed medicines. It was figured out that the level of dispensed medications knowledge was increased among respondents who attended higher education compared with those with no formal education. A similar result was stated by a study conducted in Sri Lanka where respondents who attend higher education were 2.79 times more likely to understand dispensed medication than illiterates.[10] A study conducted at HFSUH in Eastern Ethiopia revealed that respondents' educational level (higher education) increased odds of knowledge of dispensed medication by 2.71 fold.[13] Another study conducted in Gonder city, northwest Ethiopia showed attending higher education was associated with increased odds of understanding dispensed medication.[19]

The current study is also in line with other studies.[15,20,21] The relationship may be due to the fact that educated patients may easily understand medicine information provided by dispensers. However, a study conducted in Eastern Ethiopia found no significant association between patient's knowledge of medicine and educational level.[12] Our study implies that health care facilities should implement interventions (counseling and labeling of medicine using local language) that enhance medicine counseling to illiterate patients. Our finding also implies that the ministry of education and other stakeholders need to encourage access of higher education for communities.

The current study revealed that patients who were private employee were eleven times more likely to understand dispensed medication than unemployed. This could be explained by the fact that patients who have their own source of income have better access to medication related information. In this study, the number of outpatient pharmacy visits was positively associated with patient's knowledge about dispensed medicines. Patients who had four or more outpatient pharmacy visits were about three times more likely to know dispensed medicines than first visit counterparts were. This finding was supported by a study in Istanbul.[21] This implies that dispensers should consider patients frequency of visits during counseling.

Table 5 Multivariable Logistic Regression Model to Identify Independent Predictors of Patients' Knowledge of Dispensed Medicines in a Primary Hospital, Southwest Ethiopia, 2019 (n=403)

Independent Variables	COR (95% CI)	P-value	AOR (95% CI)	P- value
Resident of respondents				
Rural	Ref.	0.027	-	-
Urban	2.02(1.08–3.76)		-	-
Educational level				
No formal education	Ref.		Ref.	
Primary education	0.90(0.32–2.24)	0.719	0.54(0.17–1.72)	0.298
Secondary education	1.79(0.72–4.45)	0.211	1.60(0.50–5.06)	0.425
Tertiary education	5.44(2.36–12.53)	0.000	3.87(1.25–11.96)	0.019*
Employment status				
No job	Ref.		Ref.	
Farmer	0.53(0.19–1.44)	0.212	1.20(0.36–4.04)	0.769
Merchant	2.10(0.77–5.76)	0.148	1.96(0.56–6.89)	0.296
Private employee	6.13(2.47–15.22)	0.000	10.98(3.25–37.04)	0.000**
Government employee	1.43(0.59–3.50)	0.429	1.50(0.52–4.37)	0.453
Number of visit				
First visit	Ref.		Ref.	
Second visits	1.68(0.68–4.19)	0.264	1.61(0.53–4.92)	0.405
Third or more visits	2.53(1.12–5.74)	0.026	3.20(1.21–8.44)	0.019*
Perception of severity of illness				
Mild	Ref.		Ref.	
Moderate	1.71(0.75–3.93)	0.204	2.44(0.85–7.05)	0.098
Severe	3.06(1.46–6.43)	0.003	3.77(1.43–9.94)	0.007**
Number of medicine dispensed				
≤ 2 medicines	Ref.	0.136	Ref.	0.007**
>2 medicines	0.53(0.23–1.22)		0.20(0.20–0.60)	
Perceived language clarity				
Not clear	Ref.	0.000	-	-
Clear	3.58(1.93–6.64)		-	
Dispenser qualification				
Pharmacy technician	Ref.	0.000	Ref.	0.000**
Pharmacist	8.02(4.20–15.31)		10.02(4.45–22.56)	
Dispenser work experience				
0–3 years	Ref.	0.000	Ref.	0.000**
≥4 years	3.39(1.86–6.16)		4.82(2.13–10.92)	
Dispensing time				
<180 seconds	Ref.	0.015	–	–
≥180seconds	2.07(1.15–3.70)		–	

Notes: *Statistically significant at P-value below 0.05. **Statistically significant at P-value below 0.01.
Abbreviations: COR, crude odds ratio; CI, confidence interval; AOR, adjusted odd ratio; Ref, reference.

Our study indicated that there was a significant association between patients' perception towards illness and knowledge on dispensed medicines. This finding is consistent with a study conducted in Sri Lanka.[10] Patients with negative attitudes toward their sickness can be reluctant to follow counseling in their management plan.[22] This indicates that dispensers need into account patients' perception of illness during counseling.

The current study revealed that the number of dispensed medicines was negatively associated with

respondent's knowledge of medicines. Respondents who received more than two medications were 0.20 times less likely knowledgeable than respondents who received less than three medications. This is in line with the dispensed medications knowledge level reported from Botswana[11] and Netherland.[23] The probable justification for this could be respondents who received more medicines may not easily recall all dispensed medications information. Numerous studies showed that polypharmacy (multiple medicines per prescription) is associated with negative health outcomes, including hospitalization and mortality.[24–26] This could be an indication for implementation of interventions to improve rational prescribing and reduce polypharmacy in the outpatient pharmacy setting.

The dispenser qualification level in the current study was significantly associated with patient knowledge of dispensed medicine. The probability of dispensed medicines knowledge was highest among patients who received medicine-counseling services from pharmacists. This study finding is agreed with the finding in Botswana.[11] The possible explanation for this could be pharmacist training program (core competencies) give more emphasis to patient oriented pharmacy services. In several countries, both high income and low income, the relative significance of pharmacy technicians within the pharmacy workforce has been amplified in recent years, largely because of pharmacist shortages.[27] This implies that stakeholders need to provide on job training to pharmacy technicians on patient oriented pharmacy services.[28]

Limitations

The current study has some limitations. First, the cross-sectional nature of the study had made it incapable to create the causal relationship between knowledge of dispensed medication and independent variables. Second, the non-participatory observations may have affected the performance of dispensers in a positive way, the so-called Hawthorne effect.

Third, the patient's knowledge of dispensed medicines was assessed using an exit interview. This may not reveal the ability (knowledge level) to use medicines at their home. Fourth, the severity of illness and clarity of information data was collected based on the self-report of the patients. Self-reported data relative to other sources of information (medical records and observation) is unreliable and threatened by self-reporting bias.

Conclusion

In this study, the vast majority of patients seen at the outpatient pharmacy of primary hospital had poor knowledge about dispensed medication. From the current study, it can be concluding that patient's knowledge of dispensed medication was increased by their educational level, employment status, number of outpatient visits, and perception of severity of illness. Thus, dispensers need into account patients' educational level, perception of illness, and number of visits during counseling.

The number of medicines received was negatively associated with patient's knowledge of medicine. This implies that stakeholders need to implement interventions to improve rational prescribing and reduce polypharmacy in the outpatient pharmacy setting. Dispenser qualification level and work experience of dispenser were also found to be independent determinants of knowledge of patients about dispensed medication). Therefore, stakeholders need to work in collaboration to enhance the dispensing skill of pharmacy professionals.

Abbreviations

AOR, Adjusted Odd Ratio; CI, Confidence Interval; COR, Crude Odd Ratio; HFSUH, Hiwot Fana Specialized University Hospital; MoH, Ministry of Health; OP, Outpatient; ROC, Receiver Operating Characteristics; SD, Standard Deviation; SPSS, Statistical Package for the Social Sciences; VIF, Variance Inflation Factor; WHO, World Health Organization.

Data Sharing Statement

All data used to support the results of this research are available.

Ethics Approval and Consent to Participate

The current study was conducted in accordance with the Declaration of Helsinki. This study was conducted after getting ethical approval from Arbaminch Health Sciences ethical review board. Permission was obtained from Gamo Zone Health Office and Chencha primary level hospital before starting the study. The study consisted patients that had given informed consent before data collection. In order to ascertain anonymous linkage, only the codes were recorded on the data collection tool.

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Author Contributions

All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; agreed on the journal to which the article will be submitted; gave final approval of the version to be published; and agree to be accountable for all aspects of the work.

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