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ORIGINAL RESEARCH

Exit-Knowledge About Dispensed Medications and Associated Factors Among Ambulatory Patients Attending Ayder Comprehensive Specialized Hospital, Mekelle, Ethiopia

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Background: Optimizing exit-knowledge of ambulatory patients is a major professional responsibility of pharmacists to reassure safe and cost-effective medicines use. The study assessed the exit-knowledge of ambulatory patients on their dispensed medications and associated factors.

Patients and Methods: Institutional-based cross-sectional study was conducted among ambulatory patients who visited the outpatient pharmacy of Ayder Comprehensive Specialized Hospital (ACSH) from December 2019 to February 2020. Data were entered, cleaned, and analyzed using SPSS version 20. Binary logistic regression was employed to determine factors associated with exit-knowledge on their dispensed medications. At a 95% confidence interval (CI), $p \leq 0.05$ was considered statistically significant.

Results: The study analyzed 400 patients; more than half of the participants were males (55.5%). The mean age of the participants was 41.3 years (mean ± standard deviation (SD), ±13). Less than half of the patients did not recall the name (44.5%) and major side effects (31.2%) of each medication. Furthermore, the overall sufficient knowledge was found to be 81%. Patients with single marital status were 4.454 times to have sufficient exit-knowledge of their dispensed medications than widowed ($p=0.050$) participants. Besides, patients who responded neutral clarity of pharmacist instruction had 4.745 times sufficient exit-knowledge than those who responded not clear ($p=0.049$). On the other hand, participants who got "enough" ($p<0.0001$) and "not enough" ($p=0.006$) information from the pharmacist were found to have a positive association with sufficient exit-knowledge than those who responded "I do not know".

Conclusion: The majority of patients had sufficient exit-knowledge of their dispensed medications. Martially single, neutral clarity of pharmacist's instructions and adequacy of the information delivered by the pharmacist were positively associated with participants' exit-knowledge of their dispensed medications. Hence, conducting a multicenter study, we recommend pharmacists to counsel their patients to underpin patients' knowledge of their dispensed medications.

Keywords: exit-knowledge, dispensing, ambulatory, patients

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Background

Dispensing is one of the major professional roles of pharmacists. It is a process involving pharmacist–patient interaction to deliver medications with appropriate instructions for treatment and prevention of illnesses.[1–4] Dispensing plays a crucial

role in maintaining the rational use of medicines. As a result, the treatment outcome of patients mainly depends on their adherence to dispensed medications and lifestyle adjustments.[5–7]

Dispensing pharmacists are responsible for counseling patients following physician's prescriptions. Thus, proper pharmacist-provided counseling service is essential in maintaining a safe and cost-effective use of drugs.[8–11] Furthermore, optimal counseling is key to prevent the possibility of drug therapy problems.[12,13]

Patients should receive adequate information and counseling regarding their dispensed medications such as; the name of the medication, route of administration, frequency, benefit, duration, possible side effects, actions to be taken when a dose is missed, and other additional precautions.[14,15] Pharmacist-patients interaction during counseling is mostly influenced by the commitment, professional skill, knowledge, and experience of the pharmacists.[14,16-18] Furthermore, it could be affected by the language difference, interest, and educational status of the patient. A study from Iran showed that there was a positive correlation among pharmacist–patient interaction and patients' exit-knowledge on their dispensed medications.[19] Ongoing pharmacist–patient interaction and involvement is still a need to optimize patients' therapeutic outcomes.[20] The study done from Saudi Arabia revealed that 46.7% of patients received the complete required information from pharmacists and 7.87 were found to be the mean score of the patient's level of satisfaction.[21] Moreover, a study conducted in Pakistan claimed that 60% of patients were adequately satisfied with the counseling service of the pharmacists. The study also showed that patient satisfaction was significantly associated with the length of time for counseling ($p<0.001$).[22]

Different studies have revealed exit-knowledge of patients on their dispensed medication is not optimal. A study from Israel revealed that 36% and 60% of the patients did not receive adequate information on their previous and new medications, respectively.[23] Likewise, a study conducted in Jimma, Ethiopia reported that 73.3% and 66% of the patients had misunderstood the dosage regimen and the frequency of administration, respectively. Moreover, 68.25% of the patients were dispensed with no labeling of instructions.[24] Similarly, a study from Gondar, Ethiopia illustrated that adherence is significantly associated with good knowledge of dispensed medications. The study revealed that 38.3% of patients were found to have good knowledge of their medications and 39.3% were adherent to their dispensed medications.[25] Other studies conducted in Ethiopia revealed that the exit-knowledge on dispensed medication was 38.6% in Eastern Ethiopia[26] and 46% in Hiwot Fana University Specialized Hospital.[27] Furthermore, a study from the rural Gambia showed that 83.9% of patients had poor knowledge of their dispensed drugs.[28]

Collaboration and involvement of the pharmacist, the patient, and other health-care providers are mandatory in maintaining the rational use of medicine and promoting better treatment outcomes.[19,29-32] Moreover, there is a gap in maintaining adequate knowledge of ambulatory patients on their dispensed medications intended to be taken.[32,33] Dispensing is also considered as an"exit gate" and the last point of contact of the patient with hospital clinicians. Unless patients are adequately counseled on their treatment and medications at this fundamental point, all the investigations, resources, and time invested for the patient would be futile. This would, in turn, compromise the health and economic outcomes both to the patient and the institution. It is imperative, therefore, to continually assess the dispensing practice along with the patients' exit-knowledge.

To the best of our knowledge, no data is available related to the exit-knowledge of dispensed medications in Tigray Regional State, Northern Ethiopia. The study assessed the practice of outpatient pharmacy service, knowledge of patients on their dispensed medication, and factors affecting knowledge of dispensed medications. Hence, the study was hypothesized to determine the exit-knowledge and identify the barriers affecting knowledge of dispensed medications. The study would have a significant impact to improve patient's exit-knowledge of their dispensed medications which in turn could promote and encourage safe and cost-effective use of medicines.

Patients and Methods

Study Design and Area

An institutional-based cross-sectional study was conducted among ambulatory patients visiting the outpatient pharmacy of Ayder Comprehensive Specialized Hospital (ACSH). ACSH is found in Mekelle city, which is the capital city of Tigray Regional State, Ethiopia. Mekelle city is found at 783 Km north of Addis Ababa. The hospital has a capacity of about 500 in-patient beds and provides general in-patient, outpatient, and intensive care

unit services in its major departments (internal medicine, surgery, pediatrics, and gynecology) and other specialty units.

Study Population

Ambulatory patients who received medication from the outpatient pharmacy from December 2019–February 2020 were included in the study. Patients who were mentally stable and willing to participate in the study were deemed to be eligible for the study. On the other hand, patients who were dispensed with more than three medications were excluded from the study because of the greater possibility of confusion with an increase in the number of medications.

Sample Size Determination and Sampling Technique

The sample size was calculated using a single population proportion formula.

$$\mathrm{n} = \frac{Z\alpha 2 * P * (1-P)}{d2\ (0.05)2} = (1.96)2 * 0.386 * 0.614 = 364$$

where n=required sample size, Z=standard value in Z-distribution at 95% confidence interval, P=0.386 (38.6%) sufficient knowledge reported from a study conducted in Eastern Ethiopia[26] and d=margin of error or precision (0.05). Adding 10% of contingency for non-response, the sample size was 400 (364*0.1=36.4, then 364+36.4=400). Finally, 400 was the estimated sample size used. All patients who fulfill the inclusion criteria were consecutively enrolled until the sample size needed was achieved.

Data Collection Processes

A medication knowledge scaling questionnaire was adopted from previously conducted studies.[26,27] The questionnaire was translated into the local language which is a Tigrigna language. The structured questionnaire using patient interviews was used to record sociodemographic variables such as; sex, age, residency, ethnicity, religion, marital status, educational status, and occupation, service provision of the pharmacist, and exit-knowledge of dispensed medications. A pre-test was done in 5% (n=20) of the participants. Oral informed consent was obtained from adult patients and legal guardian informed oral consent was obtained for patients under the age of 18 years, and the purpose of the study was explained for the study participants. Data were collected using four trained pharmacists working outside the hospital. Supervision was done on a daily basis by the principal investigator to assure the completeness of the questionnaire. No personal identification of the study participants was used to keep participants' confidentiality.

Data Analysis and Interpretation

Data were entered, cleaned, and analyzed using SPSS version 20. Descriptive statistics were employed to determine frequency, percent, mean, and SD of the variables. Sociodemographic variables, service provision of pharmacy personnel, and other possible variables were computed using binary logistic regression to determine factors associated with sufficient exit-knowledge of their dispensed medications. Then, variables with $p \leq 0.05$ at 95% CI in bivariate analysis were computed using multivariate analysis to minimize the effect of potential confounders.

Operational Definitions

The outcome variable was the exit-knowledge sufficiency of dispensed medications. Exit-knowledge was deemed to be sufficient when a participant responded a positive answer for at least two-thirds of the questions, which is at least eight questions out of 12 for his/her dispensed medications.[26]

Results

As shown in Table 1, of 400 participants, more than half were males (222, 55.5%) and about half (203, 50.8%) accounted for urban residents. The mean age of the participants was 41.3 years (mean ± SD, ±13), and the majority (187, 46.8%) ranged from 19 to 39 years. More than half of the participants (250, 62.5%) were married, and the majority of them completed primary school (122, 30.5%), followed by secondary school (111, 27.8%). In the case of occupational status, the majority were farmers (100, 25.0%), followed by privately employed (80, 20.0%).

Most of the participants (354, 88.5%) had a repeated visit of three times and above, and about three-fourths (302, 75.5%) revealed that they had good interaction with the pharmacist. The primary language of communication with the pharmacist was Tigrigna (337, 84.2%). Moreover, almost all of them (378, 94.5%) reported that the voice and tone of the pharmacy personnel were clear. Regarding the comfort and cleanness of the waiting area, 173 (43.3%) and 137 (34.0%) participants reported neutral and comfortable, respectively. More than half of the participants (250, 62.5%) revealed that the pharmacy service provider was polite, and around three-fourths (297, 74.3%) obtained clear information on how to take their

Table 1 Sociodemographic Characteristics of Ambulatory Patients Attending Ayder Comprehensive Specialized Hospital from December 2019 to February 2020

Variables	Frequency (%)
Sex	
Male	222 (55.5)
Female	178 (44.5)
Residency	
Urban	203 (50.8)
Rural	197 (49.2)
Age in years (mean + SD, 41.3±13)	
≤18	4 (1.0)
19–39	187 (46.8)
40–59	172 (43.0)
≥60	37 (9.2)
Ethnicity/nationality	
Tigray	324 (81)
Amhara	29 (7.3)
Afar	28 (7.0)
Eritrea	17 (4.2)
Sudan	2 (0.5)
Religion	
Orthodox	330 (82.5)
Muslim	53 (13.2)
Protestant	10 (2.5)
Catholic	7 (1.8)
Marital status	
Married	250 (62.5)
Single	92 (23.0)
Divorced	26 (6.5)
Widowed	32 (8.0)
Educational status	
Illiterate	72 (18)
Can read and write	30 (7.5)
Primary school	122 (30.5)
Secondary school	111 (27.8)
Tertiary	65 (16.2)
Occupation	
Government employed	57 (14.3)
Farmer	100 (25.0)
Merchant	68 (17.0)
Privately employed	80 (20.0)
Daily laborer	16 (4.0)
Student	14 (3.5)
Others	65 (16.2)

Abbreviation: SD, standard deviation.

medications. Also, the perceived sufficiency of the dispenser's information was found enough in more than half of the participants (257, 64.3%) (Table 2).

Table 2 Pharmacy Service Provision of Ambulatory Patients Attending Ayder Comprehensive Specialized Hospital from December 2019 to February 2020

Variables	Frequency (%)
Frequency of visit to the pharmacy	
First time	10 (2.5)
Second time	36 (9.0)
Repeated times (three times and above)	354 (88.5)
Interaction with pharmacist	
Poor	16 (4.0)
Moderate	82 (20.5)
Good	302 (75.5)
Primary language of communication	
Tigrigna	337 (84.2)
Amharic	31 (7.8)
Afar	28 (7.0)
Other	4 (1.0)
Voice and the tone of the pharmacy personnel	
Clear	378 (94.5)
Not clear	22 (5.5)
Comfort and cleanness of the waiting areas	
Very comfortable	7 (1.8)
Uncomfortable	77 (19.2)
Neutral	173 (43.2)
Comfortable	137 (34.3)
Very comfortable	6 (1.5)
Politeness and interest of pharmacy service provider	
Very polite	63 (15.8)
Polite	250 (62.5)
Neutral	74 (18.5)
Impolite	13 (3.3)
Clarity of the pharmacy service providers on instructions how to take medication	
Clear	297 (74.3)
Neutral	89 (22.3)
Not clear	14 (3.5)
Perceived sufficiency of dispensers' information	
Enough	257 (64.3)
Not enough	71 (17.8)
I do not know	72 (18.0)

As illustrated in Table 3, less than half of the participants (178, 44.5%) recalled the name, and more than two-thirds (290, 72.5%) recalled the indication of each medication. Most of the participants recalled the route of administration (381, 95.3%), duration of treatment (370, 92.5%), and the frequency of each medication (378, 94.5%). More than two-thirds of the participants (282, 70.5%) were aware of what

Table 3 Exit-Knowledge of the Study Participants on Their Dispensed Medication of Outpatient Pharmacy Ayder Comprehensive Specialized Hospital from December 2019 to February 2020

Variables	Frequency (%)
Has recalled the name of the medication	
No	222 (55.5)
Yes	178 (44.5)
Has recalled the indication of each medication	
No	110 (27.5)
Yes	290 (72.5)
Has recalled the route of administration each medication	
No	19 (4.8)
Yes	381 (95.3)
Has recalled the duration of treatment for each medication	
No	30 (7.5)
Yes	370 (92.5)
Has recalled the frequency of each medication	
No	22 (5.5)
Yes	378 (94.5)
Has recalled the what to avoid during taking the medication	
No	118 (29.5)
Yes	282 (70.5)
Has recalled the possible side effect of the medication	
No	275 (68.8)
Yes	125 (31.2)
Has recalled the instructions while taking each medication	
No	35 (8.8)
Yes	365 (91.2)
Has recalled the action to be taken when dose is missed	
No	114 (28.5)
Yes	286 (71.5)
Has recalled the proper storage of the medications	
No	82 (20.5)
Yes	318 (79.5)
Labelling on medication done	
No	83 (20.8)
Yes	317 (79.2)
Has recalled expectation of the outcome from the treatment	
No	2 (0.5)
Yes	398 (99.5)
Knowledge sufficiency	
Insufficient	76 (19.0)
Sufficient	324 (81.0)

(*Continued*)

Table 3 (Continued).

to avoid during medication taking and 275 (68.8%) participants did not recall the major possible side effects of each medication. About (365, 91.2%) patients understood instructions while taking their medications, and (286, 71.5%) reported they will take action when a dose is omitted. Furthermore, more than three-fourths of the participants (318, 79.5%) were aware of the proper storage of their medications, and labeling was made on (317, 79.2%) participants. Almost all of the participants (398, 99.5%) reported that they expect an outcome from the treatment. Overall, more than two-thirds (324, 81.0%) had sufficient exit-knowledge of their dispensed medications.

Based on binary logistic regression analysis, patients with single marital status had 4.454 times sufficient exit-knowledge than those of widowed (95% CI: 1.003–19.776). Participants who claimed neutral clarity on the instruction provided on how to take each medication were found 4.745 times more likely to have sufficient exit-knowledge in comparison to those who responded as not clear (95% CI: 1.006–22.370). Furthermore, the odds of sufficient exit-knowledge was 8.995 (95% CI: 4.310–18.772) and 3.377 (95% CI: 1.420–8.028) times higher in those who responded "I got enough information from the pharmacist" and "I did not get enough information from the pharmacist", in comparison to those who responded "I do not know", respectively (Table 4).

Discussion

This study assessed the outpatient dispensing service provision of pharmacy personnel, knowledge of ambulatory patients on their dispensed medications, and factors affecting the knowledge status of patients on their dispensed drugs.

Exit-knowledge of dispensed medications is critical in implementing the instructions directed by a pharmacist that affects the rational use of medicines in the community. In this study, most of the patients (95.3%, 92.5%, 94.5%, 91.2%, 79.5%, and 99.5%), recalled the route, duration, frequency, instructions, proper storage, and the expected outcome of the dispensed medications, respectively. This

Table 4 Factors Associated with Exit-Knowledge Status of Dispensed Medications for Ambulatory Patients Attending Ayder Comprehensive Specialized Hospital from December 2019 to February 2020

Variables	Sufficient Knowledge		COR (95% CI)	*p*-value	AOR (95% CI)	*p*-value
	Yes N (%)	No N (%)				
Residency						
Urban	174 (85.7)	29 (14.3)	1.880 (1.127–3.136)	0.016	1.304 (0.697–2.439)	0.407
Rural	150 (76.1)	47 (23.9)	1.000		1.000	
Marital status						
Single	88 (95.7)	4 (4.3)	7.333 (2.034–26.436)	0.002	4.454 (1.003–19.776)*	0.050
Married	191 (76.4)	59 (23.6)	1.079 (0.460–2.529)	0.861	1.140 (0.409–3.176)	0.802
Divorced	21 (80.8)	5 (19.2)	1.400 (0.397–4.943)	0.601	1.337 (0.324–5.520)	0.688
Widowed	24 (75)	8 (25)	1.000		1.000	
Educational status						
Illiterate	54 (75)	18 (25)	0.250 (0.087–0.719)	0.010	0.504 (0.132–1.916)	0.314
Can read and write	24 (80)	6 (20)	0.333 (0.093–1.196)	0.092	0.372 (0.078–1.771)	0.214
Primary school	88 (72.1)	34 (27.9)	0.216 (0.080–0.583)	0.003	0.393 (0.114–1.355)	0.139
Secondary school	98 (88.3)	13 (11.7)	0.628 (0.213–1.850)	0.399	0.647 (0.176–2.377)	0.512
Tertiary	60 (92.3)	5 (7.7)	1.000		1.000	
Interaction with pharmacist						
Poor	7 (43.8)	9 (56.2)	0.151 (0.054–0.424)	0.000	0.670 (0.140–3.216)	0.617
Moderate	64 (78)	18 (22)	0.689 (0.376–1.262)	0.227	1.157 (0.553–2.419)	0.699
Good	253 (83.8)	49 (16.2)	1.000		1.000	
Voice and tone of the pharmacy personnel						
Clear	314 (83)	64 (17)	5.887 (2.439–14.211)	0.000	2.019 (0.639–6.377)	0.231
Not clear	10 (45.5)	12 (54.5)	1.000		1.000	
Politeness and interest of pharmacy service provider						
Very polite	51 (80.9)	12 (19.1)	3.643 (1.035–12.827)	0.044	2.490 (0.499–12.411)	0.266
Polite	213 (85.2)	37 (14.8)	4.934 (1.570–15.505)	0.006	2.682 (0.602–11.940)	0.195
Neutral	53 (71.6)	21 (19.4)	2.163 (0.650–7.196)	0.208	1.713 (0.375–7.826)	0.487
Impolite	7 (53.8)	6 (46.2)	1.000		1.000	
Clarity of the pharmacy service providers on instructions how to take medication						
Clear	254 (85.5)	43 (14.5)	10.633 (3.401–33.245)	0.000	3.646 (0.738–18.010)	0.112
Neutral	65 (73)	24 (27)	4.875 (1.484–16.012)	0.009	4.745 (1.006–22.370)*	0.049
Not clear	5 (35.7)	9 (64.3)	1.000		1.000	
Perceived sufficiency of dispensers' information						
Enough	236 (91.8)	21 (8.2)	11.238 (5.912–21.363)	0.000	8.995 (4.310–18.772)*	<0.0001
Not enough	52 (73.2)	19 (26.8)	2.737 (1.360–5.509)	0.005	3.377 (1.420–8.028)*	0.006
I do not know	36 (50)	36 (50)	1.000		1.000	

Note: *$p \leq 0.05$, statistically significant.
Abbreviations: AOR, adjusted odds ratio, CI, confidence interval, COR, crude odds ratio.

reflects that the study patients have a good memory of their medications when leaving the dispensary. Our finding is relatively comparable with a study conducted in Eastern Ethiopia, which showed that majority of the participants (89.2%, 82.5%, 72.3%, 63%, 54.9%, and 54.7%) recalled frequency, route, medication instruction, expected

therapeutic outcome, proper storage conditions, and drug interactions, respectively.[26] Likewise, the study from Eastern Ethiopia revealed that 37.2%, 37.2%, and 28.7% recalled the name, major side effects, and actions to be taken when a dose is omitted, respectively. In the same way, our finding showed that less than half of the participants recalled the name (44.5%) and major side effects (31.2%) of their dispensed medications. Furthermore, a study done in Hiwot Fana Specialized University Hospital, Ethiopia showed that 46.4%, 34.6%, and 33.6% of patients did not recall the names, actions when a dose is missed, and major side effects, respectively.[27] This might be due to the educational status of the study participants, the workload of the pharmacist, and the lack of attention and dispensing time of the pharmacists.[18,27]

Overall, 81% of patients had sufficient exit-knowledge regarding their dispensed medications. This finding was higher than the studies conducted; in Eastern Ethiopia 38.6%[26] and in Hiwot Fana University Specialized Hospital 46%.[27] Additionally, a study conducted in Gondar, Ethiopia revealed that 38.3% of patients were found to have good knowledge on their medications[25] and a study from the rural Gambia showed that 16.1% of patients had good knowledge on their dispensed drugs.[28] Besides, a study conducted in selected community pharmacists of Tabriz, Iran revealed that patients' knowledge of their dispensed medication was 3.18 score out of 5.[19] The discrepancy might be due to the study setting difference in which there could be professional competency differences among pharmacists.[30] The other reason is a language barrier,[34] thereby in 84.2% of the patients, Tigrigna was the primary language of communication of pharmacist–patient interaction, while the rest 13.8% of patients were not good at Tigrigna language. Similarly, the language barrier was reported by studies conducted from Eastern Ethiopia, in which Amharic (65.9%) and Afan Oromo (28%) were the means of communication dominantly, which resulted in a low level of exit-knowledge sufficiency.[26] The other plausible reason might be due to repeated visit of patients to the hospital in which 88.5% had a visit of three times and above so that they could have a chronic illness which might be improved by previous counseling. This was explained by a study conducted in Saudi Arabia, where patients with a previous history of counseling (52.9%) had excellent knowledge of side effects of their dispensed medication in contrast to those who had not (12.5%).[35] Another similar study from Saudi Arabia showed also patients who had counseling histories from pharmacists were found to have 5.2 ($p<0.05$) times more satisfaction on the counseling service than patients who never had.[21]

Regarding the factors that affect exit-knowledge; marital status, clarity of pharmacist instruction, and the perceived sufficiency of obtained information affected the exit-knowledge on dispensed medications. This study revealed that single patients had 4.454 times sufficient exit-knowledge of their medications than widowed (95% CI: 1.003–19.776). The odds of single were higher than married concerning sufficient exit-knowledge (4.454 and 1.140). This finding was in line with a study reported from Eastern Ethiopia, in which the knowledge of dispensed medication was higher among single patients than married (AOR=1.887; 95% CI: 0.33–0.84).[27] However, no studies had revealed that being single has more sufficient exit-knowledge than widowed. Possibly, it can be explained due to single patients were younger (21.5% (n=86) patients under 40 years) and could have better attention to their self-care practice, whereas widowed were aged (only two patients (n=2) were under 40 years) and are prone to be affected by socio-economic factors.

Clarity of the pharmacist instruction was found to be the other factor that affected the level of exit-knowledge of dispensed medications. In fact, patients who did not have clear instructions from the pharmacist are prone to have less exit-knowledge. The finding of the present study revealed that patients who responded neutral clarity of pharmacist instruction on how to take each medication were found 4.745 times more likely to have sufficient exit-knowledge in comparison to those who responded not clear (95% CI: 1.006–22.370). Likely, a study done in Eastern Ethiopia revealed; having clear instruction from the pharmacist was positively associated with sufficient knowledge than those who responded not clear.[27] The current finding also revealed that patients having clear information from the pharmacist had 3.646 times sufficient exit-knowledge than those who responded not clear. Furthermore, the current study showed participants who got enough and not enough clear information from the pharmacist had sufficient exit-knowledge than who patients who never know by 8.995 (95% CI: 4.310–18.772) and 3.377 (95% CI: 1.420–8.028) times, respectively.

Limitations of the Study

The study is not without limitations. It is a single centered and the exit-knowledge of the patients might be affected by the recall ability of the patients since the questions were subjective. On top of that, the study excluded patients who

received more than three medications because it was thought to affect the recall information of patients as the patients received more than three medications. Thus, it might underestimate the result of our findings. Future investigations investigating the patients' long-term memory and knowledge of their medications may be warranted.

Conclusion

Generally, the majority of patients had sufficient exit-knowledge of their dispensed medications. Patient's perception on the sufficiency of obtained information, single marital status, and clarity of pharmacist's instruction has affected patients' exit-knowledge sufficiency. Therefore, on top of doing a multicenter study, we recommend pharmacists to counsel their patients adequately to enhance knowledge of patients to their dispensed medications.

Abbreviations

ACSH, Ayder Comprehensive Specialized Hospital; AOR, adjusted odds ratio; CI, confidence interval; SD, standard deviation.

Ethical Standards

The study was approved by the Ethical Review Board (ERB) of the College of Health Sciences, Mekelle University. A letter of support was obtained from the medical director's office of the hospital. Oral informed consent was obtained from adult patients and legal guardian informed oral consent was obtained for patients under the age of 18 years and approved by the Ethical Review Board committee. The study was conducted following the ethical standards of the institutional and national research committees. The study also adhered to the declarations of Helsinki.

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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Disclosure

The authors declare that they have no competing interests.

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