

Pharmacy professionals' understanding, attitude and practice toward pharmaceutical care in Motta town, Northwest Ethiopia: A cross-sectional study

SAGE Open Medicine

Volume 12: 1–11

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DOI: 10.1177/20503121241267239

journals.sagepub.com/home/smo



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Abstract

Objective: Although pharmaceutical care provision is the primary goal of the pharmacy profession, its actual implementation has been lacking in developing nations. Therefore, this study investigated pharmacy professional's understanding, attitudes, and practice toward pharmaceutical care.

Methods: A cross-sectional study was conducted from 30 July 2022 to 30 August 2022, at all community and hospital pharmacies in Motta town, Northwest Ethiopia. Data were gathered using a self-administered questionnaire and analyzed using SPSS version 26.0. A logistic regression model with a *p*-value of 0.05 and a 95% confidence interval was applied to identify factors associated with understanding, attitude, and practice.

Result: The study had a 97.7% response rate. Of the 130 participants, 71 (54.6%) were females. Slightly more than half (56.2%) of the participants were aware of the aim (56.2%) of pharmaceutical care and responsibilities (56.9%) of pharmacy professionals in the pharmaceutical care process. However, most participants lack awareness of the similarities and differences between clinical pharmacy and pharmaceutical care. Concerning their attitude, most participants (66.9%) believed that pharmaceutical care provision should be the primary responsibility of pharmacy professionals, and it will benefit patients (61.6%) and the healthcare system (60.8%). Pharmacy professionals frequently evaluate their patients and identify health or drug therapy-related problems and potentially available therapeutic alternatives. However, they rarely engaged in any health screening activities or provided feedback to the doctor on the patient's progress. Training status, sex, and years of practice/understanding were significantly related to pharmacy professionals' level of understanding, attitudes, and practice toward pharmaceutical care, as both years of practice and understanding are related to practice.

Conclusion: Our study revealed a deficit in pharmacy professionals' understanding, attitude, and practice toward pharmaceutical care in Motta town, Northwest Ethiopia. Policymakers, health authorities, and educational institutions should work together to develop strategies and instructional initiatives that optimize pharmaceutical care provision and thus achieve optimal patient outcomes and lower healthcare costs.

Keywords

Pharmaceutical care, pharmacy professionals, Ethiopia

Date received: 14 February 2024; accepted: 21 June 2024

Introduction

Over the past 4 decades, the pharmacist's role has expanded from traditional product-oriented dispensing to patient-oriented pharmaceutical care (PC) practice. Pharmacists are becoming a part of the healthcare team and interacting with health professionals to provide optimized patient care services in hospitals and other clinical settings.^{1,2} International Pharmaceutical Federation (FIP) defines pharmaceutical

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care (PC) as “the responsible provision of pharmacotherapy to achieve definite outcomes that improve or maintain patients quality of life.”³ However, the definition has a limitation of not specifying the provider of PC, focusing on a collective of patients as the recipients of pharmaceutical care (PC) service, definitions named “pharmacotherapy” as the subject, and the outcome measured in terms of quality of life. Thus, 15 years after the introduction of the FIP definition of PC, Pharmaceutical Care Network Europe (PCNE) redefined the word PC as “the pharmacist’s contribution to the care of individuals to optimize medicines use and improve health outcomes.”^{3,4} PCNE redefines the term in a clear way that the provider of PC remains known (pharmacists), recipients of the service are individual patients, the definition named medication use as the subject term, and the goal is achieving optimal outcomes.^{4–6}

Pharmaceutical care prevents disease or medication-related complications through early identification, detection, and prevention of drug-related problems. It also enhances favorable clinical outcomes, optimizes the patient’s health-related quality of life,^{7,8} improves patient medication adherence, reduces healthcare costs, and makes the public aware of healthy lifestyle choices.^{9,10} A study carried out on the clinical and financial effects of pharmaceutical care services showed that 61% of drug-related problems were identified and resolved by pharmaceutical care provision, consequently, patients’ clinical states have been improved by 83%, and \$1,134,162 medical expenses were saved.¹¹

Different nations have various forms and levels of pharmaceutical care development and adoption, depending on their legal, political, and healthcare systems.¹² Ethiopia has taken several measures to integrate PC into the healthcare system, including establishing a 5-year patient-oriented bachelor of pharmacy (BPharm) curriculum in government universities and a postgraduate program launched in clinical pharmacy and pharmacy practice program.^{13,14} Additionally, the Ethiopian Hospital Reform Implementation Guideline (EHRIG),¹⁴ which promotes interdisciplinary collaboration between doctors and pharmacists in the practice of patient-oriented pharmacy service, was also introduced to the national healthcare system by the Ethiopian Food, Medicines, and Health Care Administration and Control Authority (FMHACA).^{15–17} Since physicians in Ethiopia are exclusively involved in providing direct patient care, practical implementation of the guidelines is rare in practice. As a result, pharmacists’ involvement remains limited and ultimately relies on physicians’ willingness to acknowledge pharmacists’ roles. Furthermore, there is a gap in the general public perception about pharmacists’ role. Therefore, PC practice in Ethiopia is still in its early stages, poorly developed, and not fully adopted.^{17,18}

The ability of pharmacists to deliver high-quality pharmaceutical care is influenced by several factors, such as the cognitive level and subjective attitude of pharmacists

toward pharmaceutical care, practical obstacles that pharmacists encounter at their workplace, and their overall workload. Furthermore, a pharmacist’s subjective attitude and understanding of pharmaceutical care may have an impact on their subjective attitudes, goals, and behaviors when delivering pharmaceutical care, which has an impact on the quality of the service they provide and thus affect the outcomes of their services for patients.^{6,13–15} Various research papers also showed that training status, year of experience, and practice setting of pharmacists are additional factors affecting the level of understanding, attitude, and practice toward PC.^{17,19–21}

PC service is crucially important in reducing mortality and protecting public health in low- and middle-income countries with a high prevalence of major medicine-treatable diseases²² and drug-related problems. However, its practical implementation is limited.^{17,23} Although Ethiopia is one of the developing countries with a higher prevalence of drug-related problems (accounted around 70%),²⁴ limited health-care resources, and a poor educational/healthcare system,²⁵ to the author’s knowledge, few studies were conducted on the understanding, attitude, and practice of pharmacy professionals toward pharmaceutical care in the country and study area. It is essential to determine the predictors of pharmacy professionals’ attitudes, understanding, and practices to improve pharmaceutical care implementation. The result of this study will provide baseline information to policymakers, public health agencies, and researchers to understand pharmacy professionals’ level of understanding, attitude, and practice toward PC and enable the stakeholders to develop strategies and instructional initiatives to optimize them, and thus achieve optimal patient outcomes and lower health care costs. Furthermore, the research will pave the way for future research in this field, since limited data exist in Ethiopia.

Method and materials

Study design, setting, and period

A facility-based cross-sectional study was conducted from 30 July 2022 to 30 August 2022, on pharmacy professionals working in hospital or community pharmacies in Motta Town, Northwest Ethiopia. Motta town is located in the Northwestern part of Ethiopia, at a distance of 372 km from Addis Ababa, the capital city of Ethiopia. Amhara Regional Health Bureau registered 133 (60 community and 73 hospital) pharmacy professionals working in Motta town, Northwest Ethiopia.

Study population

The source population was all pharmacy professionals’ of Motta town, and the study population was all pharmacy professionals working in the hospital and community pharmacy of Motta town during the data collection period.

Eligibility criteria

The study included all volunteer pharmacy professionals working in community or hospital pharmacies of Motta town.

The study excluded pharmacy professionals who weren't available at the workplace during the data collection period.

Sample size determination and sampling procedures

The sample size for this study was all pharmacy professionals working in community and hospital-based pharmacies of Motta towns during the study period. The list of all pharmacists was obtained from Amhara Regional Health Bureaus (the list was checked to evaluate the fulfillment of the inclusion criteria. Finally, all pharmacists who met the inclusion criteria were selected using a purposive sampling technique to take part in the study. From 133 pharmacy professionals working in Motta Town, around 130 pharmacy professionals participated in the study. Three pharmacists were out of town during the data collection period.

Study variables

Dependent variables

- ✓ Pharmacy professionals' understanding of pharmaceutical care
- ✓ Pharmacy professionals' attitude toward pharmaceutical care
- ✓ Pharmacy professionals' frequency of pharmaceutical care practice

Independent variables

- ✓ Sex
- ✓ Age
- ✓ Marital status
- ✓ Training status
- ✓ Work experience (years)
- ✓ Current practice setting
- ✓ Religion
- ✓ Ethnicity

Data collection tool and technique

A standardized, self-administered questionnaire was developed after reviewing relevant research.^{20,26–28} A pretest was done on 8% of the study population (10 pharmacy professionals) in Bichena town for content, design, readability, and comprehension before distribution. The final version of the questionnaire was modified based on the results obtained from the pretest, and the data from the pretest were excluded from the final analysis. A modified version of the questionnaire contained four parts: the first

section of the questionnaire examined sociodemographic information such as the age of respondents, gender, qualification, and years of experience. The second section explores pharmacy professionals' understanding of the concept, aim, and function of PC, as well as the pharmacists' role in the PC process using 12 true or false statements, 5 of which were false statements. The third section explores pharmacist's attitudes toward pharmaceutical care. The Pharmaceutical Care Attitude Survey (PCAS) and its modified versions for pharmacists served as the primary basis for this section.^{19,20,23,27,28,29} It had twelve items total, and each item was scored on a five-point Likert scale that went from 1 (strongly disagree) to 5 (Strongly agree). The fourth section explores the frequency of PC provision and contains twelve statements with a 5-point Likert scale, ranging from "Never" to "All the time," to rate the frequency of each of the 12 mentioned PC activities. Three pharmacists who attended a 3-day training distributed a self-administered questionnaire to the respondents in their working area.

Data quality assurance

To ensure the quality of the data, data collectors were trained for 3 days about the objective, methodology, tool, and scope of the study; furthermore, study participants were oriented about the study scope and objective. The data gathering tool was sent to a senior pharmacist with clinical pharmacy and pharmacy practice specialty for face validity and approval and an English version of the data collection questionnaire was translated into Amharic and back to English.

Data processing and analysis

Data were entered into Epi-data V4.6.0.4 (Norman H. Nie, Dale H. Bent, and C. Hadlai Hull (USA)) and exported to Statistical Package for the Social Sciences (SPSS V.26) (J. Lauritsen & T. Christiansen (Denmark)) for further analysis. Descriptive statistics was used to summarize demographic data, pharmacy professionals' understanding of and attitude toward PC provision, and their frequency of PC practice. We used a binary logistic regression model to evaluate the relationship between the independent and dependent variables. A multivariable logistic regression model was used for variables with $p < 0.25$ in the bivariate logistic regression to identify factors associated with pharmacy professionals' understanding, attitude, and practice toward PC. In the multivariable logistic regression analysis, variables with $p \leq 0.05$ at 95% CI were considered statistically significant.

Operational Definitions

Pharmacy professionals: Specialists in drug therapy and primary care providers who promote medication use for patients' benefit.¹⁷

Table 1. Sociodemographic characteristics of pharmacy professionals in Motta town, Northwest Ethiopia, 2022 (n = 130).

Respondents' characteristics category		Frequency (%)
Sex	Female	71 (54.6)
	Male	59 (45.4)
Age	<30 years	56 (43.1)
	30–39 years	51 (39.2)
	>40 years	23 (17.7)
Age (N = 130) mean (SD)	32.65 (6.9)	
Training status	BPharm with new clinical-oriented curriculum	54 (41.5)
	BPharm with the old curriculum	76 (58.5)
Years in practice (year)	≤4 years	39 (30.0)
	5–9 years	29 (22.3)
	≥10 years	62 (47.7)
Current practicing area	Hospital pharmacy	88 (67.7)
	Community pharmacy	42 (32.3)
Marital status	Single	45 (34.6)
	Married	63 (48.5)
	Not lived with their partners (divorced, windowed)	22 (16.9)
Religion	Orthodox	52 (40.0)
	Muslim	53 (40.8)
	Protestant	25 (19.2)
Ethnicity	Amhara	101 (77.7)
	Tigray	18 (13.8)
	Others	11 (8.5)

Bpharm: bachelor of pharmacy; SD: standard deviation.

Understanding: We used a 12-item composite score to assess the pharmacy professionals' understanding of the concept, aim, and function of PC, as well as the pharmacists' role in the PC process. (The cumulative score below the mean was considered as "Adequate understanding" and those with scores above or equal to the mean were considered as "Inadequate understanding").

Attitude: A five-point Likert scale (ranging from 1 strongly disagree to 5 strongly agree) was utilized to assess the respondents' agreement with 12 PC-related items to determine the respondent's level of attitude. Each respondent's total score ranged from 12 to 60. ("Favorable attitude" was defined as a score of a median value or higher, while "unfavorable attitude" was defined as a score below the median value).

Practice: A five-point Likert scale (ranging from 1 never to 5 most of the time) was utilized to assess the respondents' agreement with 12 PC-related items to determine the frequency of PC provision. Each respondent's total score ranged from 12 to 60. ("Good provision of PC" was defined as a score of median value or higher, while "poor provision of PC" was defined as a score below median value).

Result

Sociodemographic characteristics of the respondents

One hundred thirty participants enrolled in the study with a 97.7% response rate. Slightly more than half (54.6%) of the

participants were females and working in hospital pharmacies 88(67.7%). The mean (\pm SD) age was 32.65 years (\pm 6.9). Additionally, 76 (58.5%) of the participants had a bachelor's pharmacy with an old curriculum, and nearly half of the participants (47.7%) had been practicing in the study area for more than 10 years (Table 1).

Pharmacy professional's understanding of pharmaceutical care

Among study participants, more than half of participants are aware that improving and maintaining patient's quality of life is the primary aim of pharmaceutical care 73 (56.2%) and pharmacists are directly responsible for patient's health outcomes 74 (56.9%) as well as 71 (54.6%) of participants believe that the pharmacist identifies and resolves patient's actual and potential drug therapy problems; however, most of the participants (61.5%) lack understanding on how patients are involved in the PC process and the similarities/difference between clinical pharmacy and pharmaceutical care. Generally, more than half (57.7%) of pharmacy professionals had an adequate understanding of pharmaceutical care (Table 2).

Pharmaceutical care understanding of pharmacy professionals and associated factors

In multivariate logistic regression, only training status had a statistically significant association with understanding.

Table 2. Pharmacy professional's understanding of pharmaceutical care in Motta town, Northwest Ethiopia, 2022 (n = 130).

Statement	Correct answer (%)	Incorrect answer (%)
Pharmacists are directly responsible for patient's health outcomes	74 (56.9)	56 (43.1)
The primary aim of pharmaceutical care is to improve and maintain a patient's quality of life	73 (56.2)	57 (43.8)
Pharmaceutical care is just a medication counseling service (R)	55 (42.3)	75 (57.5)
Pharmaceutical care and clinical pharmacy are two terms used interchangeably (R)	50 (38.5)	80 (61.5)
Pharmaceutical care is an extension of the current pharmacy services (R)	62 (47.7)	68 (52.3)
In pharmaceutical care, the pharmacist identifies and manages a patient's actual and potential drug therapy problems	71 (54.6)	59 (45.4)
Pharmaceutical care involves a defined process of activities, all steps of which must be completed to provide PC	65 (50.0)	65 (50.0)
All patients with prescribed medicines require PC	63 (48.5)	67 (51.5)
To provide pharmaceutical care, drug information sources are needed	66 (50.8)	64 (49.2)
Pharmaceutical care providers must require a consultation room or private area for the provision of services (R)	46 (35.4)	84 (64.6)
The provision of pharmaceutical care offers feedback on drug therapy that optimizes the use of pharmaceuticals	64 (49.2)	66 (50.8)
Pharmaceutical care provided to patients without their active participation (R)	50 (38.5)	80 (61.5)

Adequate understanding was more likely to be acquired by pharmacists trained in a new clinical-oriented curriculum (AOR = 3.77, 95% CI: 1.57–9.08, $p = 0.003$). In bivariate and multivariate logistic regression analysis, the level of respondents' understanding was not significantly related to the remaining sociodemographic or work profiles (Table 3).

Pharmacy professional's attitude toward pharmaceutical care

Nearly half (51.5%) of pharmacy professionals had an overall favorable attitude toward pharmaceutical care (Table 4). The internal consistency of attitude scale was assessed and had Cronbach's alpha of 0.78, suggesting an acceptable level of internal consistency. Two-thirds (66.9%) of the participants believed that the primary responsibility of pharmacists should be to practice pharmaceutical care, and pharmaceutical care movement will improve patients' health (61.6%) and the healthcare system (60.8%); however, half of the study participants disagree with the statement "pharmacy students can perform pharmaceutical care during their clerkship" (Table 4).

Pharmacist's attitude toward pharmaceutical care and associated factors

In the multivariate logistic regression, males have a higher odds more likely to have a positive attitude toward pharmaceutical care (AOR = 2.36, 95% CI: 1.08–5.17, $p = 0.031$). The other sociodemographic and professional factors were not significantly associated with the respondents' degree of attitude (Table 5).

Pharmacy professional's extent (level) of pharmaceutical care provision

Most participants frequently evaluate the patient, identify patient-specific health or drug therapy-related problem(s), and identify potential available therapeutic alternatives rather than apply a comprehensive approach to patient care and explain to patients what they should expect from their medicine. They rarely or never engage in any health screening activities, follow the patient's progress to ensure the achievement of desired outcomes or provide feedback to doctors on the patient's progress. However, they seldom document PC activities and consider nonpharmacological interventions as a health/drug-related problem-solving strategy. Overall (56.2%) of participants have good practice of pharmaceutical care (Table 6).

Pharmacist's level of pharmaceutical care practice and associated factors

On multivariate logistic regression, year of practice and understanding score were predictors of PC practice. Pharmacists with less than 5 years of experience were more likely to offer pharmaceutical care (AOR = 3.98, 95% CI: 1.28–12.42, $p = 0.017$), and pharmacists with adequate understanding offer pharmaceutical care more frequently (AOR = 8.83, 95% CI: 3.25–23.96, $p = 0.00$) (Table 7).

Discussion

This study examined pharmacy professionals' understanding, attitudes, and practices toward pharmaceutical care in Motta town, Northwest Ethiopia. Our research showed a deficit in pharmacy professionals' understanding, attitude,

Table 3. Predictors of the understanding level of pharmacy professionals toward pharmaceutical care in Motta town, Northwest Ethiopia, 2022 (n = 130).

Variables	Category	Adequate n (%)	Inadequate n (%)	COR (95% CI)	AOR (95% CI)
Understanding of pharmaceutical care					
Sex	Female	45 (60)	26 (47.3)	0.59 (0.29–1.20)	0.51 (0.23–1.12)
	Male	30 (40)	29 (52.7)	1	1
Age	<30 years	27 (36)	29 (52.7)	0.49 (0.18–1.35)	0.37 (0.12–1.13)
	30–39 years	33 (44)	18 (32.7)	0.97 (0.34–2.74)	0.57 (0.17–1.86)
	≥40 years	15 (20)	8 (14.6)	1	1
Current practicing area	Hospital pharmacy	54 (72)	34 (61.8)	1.83 (0.87–3.85)	2.01 (0.85–4.75)
	Community pharmacy	21 (28)	21 (38.2)	1	1
Years in practice	≤4 years	23 (30.7)	16 (29.1)	1.43 (0.64–3.22)	2.02 (0.82–4.99)
	5–9 years	21 (28)	8 (14.5)	2.62 (1.01–6.81)	2.52 (0.89–7.09)
	≥10 years	31 (41.3)	31 (56.4)	1	1
Training status	BPharm with new clinical-oriented curriculum	39 (52)	15 (27.3)	2.88 (1.36–6.09)	3.77 (1.57–9.08)*
	BPharm with the old curriculum	36 (48)	40 (72.7)	1	1
Marital status	Single	27 (36)	18 (32.7)	0.56 (0.18–1.71)	0.67 (0.19–2.29)
	Married	32 (42.7)	31 (56.4)	0.38 (0.13–1.11)	0.52 (0.16–1.68)
	Not lived with their partners (divorced, windowed)	16 (21.3)	6 (10.9)	1	1

*Statistically significant, based on the total understanding score, pharmacists who scored mean and above the mean score of the correctly answered questions were classified as having adequate knowledge, while those who scored less than the mean were deemed to have inadequate knowledge.

Table 4. Pharmacy professional's attitude toward pharmaceutical care in Motta town, Northwest Ethiopia, 2022 (n = 130).

Statement	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
All pharmacists should offer pharmaceutical care	22 (16.9)	22 (16.9)	23 (17.7)	49 (37.7)	14 (10.8)
Preventing and resolving drug-related problems should be a primary responsibility of pharmacists in healthcare settings	14 (10.8)	42 (32.3)	11 (8.5)	56 (43.1)	7 (5.4)
Pharmacists primary responsibility should be to practice pharmaceutical care	13 (10.0)	12 (9.2)	18 (13.8)	58 (44.6)	29 (22.3)
Pharmacy students can provide pharmaceutical care while on their clerkship	20 (15.4)	45 (34.6)	14 (10.8)	38 (29.2)	13 (10.0)
I believe that pharmaceutical care practice is valuable	19 (14.6)	43 (33.1)	19 (14.6)	34 (26.2)	15 (11.5)
The provision of pharmaceutical care requires an excessive amount of time and effort (R)	19 (14.6)	33 (25.4)	20 (15.4)	56 (43.1)	2 (1.5)
I believe that pharmaceutical care provision is professionally rewarding during a clerkship	13 (10.0)	33 (25.4)	23 (17.7)	58 (44.6)	3 (2.3)
I believe that pharmaceutical care is the right path for my career	5 (3.8)	48 (36.9)	17 (13.1)	38 (29.2)	22 (16.9)
I think providing pharmaceutical care can improve the professional level of pharmacists	8 (6.2)	40 (30.8)	19 (14.6)	43 (33.1)	20 (15.4)
I feel that the pharmaceutical care movement will improve patient health	5 (3.8)	27 (20.8)	18 (13.8)	46 (35.4)	34 (26.2)
I feel that the pharmaceutical care movement will improve the healthcare system		32 (24.6)	8 (6.2)	45 (34.6)	34 (26.2)
Pharmaceutical care provision is not worth it; it is just adding workload on the pharmacists (R)	31 (23.8)	25 (19.2)	11 (8.5)	36 (27.7)	27 (20.8)

and practice toward pharmaceutical care in Motta town, Northwest Ethiopia, which is supported by previous studies.^{17,26} The individualized understanding and attitude of pharmacy professionals toward pharmaceutical care could explain this. Only 38.5% of those pharmacists had a proper

understanding of the similarities and differences between clinical pharmacy and pharmaceutical care, which is comparable with the finding of a study conducted in Qatar (35%),²⁰ but inconsistent with studies done in Thailand (63.7%)²⁷ and China (21.5%).¹⁹ Even though the goals of

Table 5. Predictors of the attitude of pharmacy professionals toward pharmaceutical care in Motta town, Northwest Ethiopia, 2022 (n = 130).

Variables	Category	Favorable (%)	Unfavorable (%)	COR (95% CI)	AOR (95% CI)
Attitude on pharmaceutical care					
Sex	Male	36 (53.7)	23 (36.5)	2.02 (1.00–4.07)	2.36 (1.08–5.17)*
	Female	31 (46.3)	40 (63.5)	1	1
Age	<30yrs	36 (53.7)	20 (31.7)	1.96 (0.73–5.25)	2.36 (0.80–6.97)
	30-39yrs	20 (29.9)	31 (49.2)	0.70 (0.26–1.89)	0.88 (0.29–2.68)
	>40yrs	11 (16.4)	12 (19.1)	1	1
Current practicing area	Hospital pharmacy	42 (62.7)	46 (73)	0.62 (0.29–1.30)	0.61 (0.26–1.44)
	Community pharmacy	25 (37.3)	17 (26)	1	1
Years in practice	≤4yrs	25 (37.3)	14 (22.2)	1.78 (0.78–4.06)	1.63 (0.67–4.00)
	5–9yrs	11 (16.4)	18 (28.6)	0.61 (0.24–1.50)	0.68 (0.25–1.81)
	≥10yrs	31 (46.3)	31 (49.2)	1	1
Training status	BPharm with new clinical-oriented curriculum	22 (32.8)	32 (50.8)	0.47 (0.23–0.96)	0.49 (0.21–1.13)
	BPharm with the old curriculum	45 (67.2)	31 (49.2)	1	1
Marital status	Single	23 (34.3)	22 (34.9)	1.83 (0.64–5.21)	1.38 (0.43–4.38)
	Married	36 (53.7)	27 (42.9)	2.33 (0.85–6.35)	1.72 (0.58–5.10)
	Not lived with their partners (divorced, windowed)	8 (12)	14 (22.2)	1	1

*Statistically significant; Based on the total attitude score, pharmacists who scored the median and above the median score of the correctly answered questions were classified as having a favorable attitude, while those who scored less than the median were deemed to have an unfavorable attitude.

Table 6. Pharmacy professionals frequency of pharmaceutical care practice in Motta town, Northwest Ethiopia, 2022 (n = 130).

Statements	All of the time	Most of the time	Sometimes	Rarely	Never
Carefully examine the patient and gather all the information required in case a recommendation or intervention is needed	45 (34.6)	34 (26.2)	28 (21.5)	10 (7.7)	13 (10.0)
Reviewing patient data to identify patient-specific health or drug therapy-related problem(s)	33 (25.4)	17 (13.1)	35 (26.9)	32 (24.6)	13 (10.0)
Identify available therapeutic alternatives and consider the advantages and disadvantages of each alternative with the patient	22 (16.9)	25 (19.2)	36 (27.7)	32 (24.6)	15 (11.5)
Consider nonpharmacological interventions as a health/drug-related problem-solving strategy or as a preventive measure	19 (14.6)	19 (14.6)	38 (29.2)	30 (23.1)	24 (18.5)
Explain to patients what they should expect from their medicine	17 (13.1)	23 (17.7)	39 (30.0)	32 (24.6)	19 (14.6)
Construct a patient-specific action plan with the patient, including identifying the targeted health outcomes and the most effective (drug or nondrug) approaches to achieve them	21 (16.2)	25 (19.2)	34 (26.2)	31 (23.8)	19 (14.6)
Apply a comprehensive approach to patient care (consider the patient's financial, social, and medical requirements when creating the action plan)	20 (15.4)	21 (16.2)	33 (25.4)	41 (31.5)	15 (11.5)
Assess the patient's compliance with the plan	21 (16.2)	21 (16.2)	36 (27.7)	38 (29.2)	14 (10.8)
Follow the patient's progress to ensure that the intended results are achieved	19 (14.6)	14 (10.8)	40 (30.8)	37 (28.5)	20 (15.4)
Provide feedback to the patient's doctor with an update on how the action plan is going and what the final results will be	19 (14.6)	14 (10.8)	36 (27.7)	48 (36.9)	13 (10.0)
Systematically document all steps in the PC process	15 (11.5)	19 (14.6)	35 (26.9)	45 (34.6)	16 (12.3)
Monitor adverse drug reactions and drug compliance among patients	18 (13.8)	16 (12.3)	48 (36.9)	23 (17.7)	25 (19.2)
Get involved in health screening activities, such as taking blood pressure	10 (7.7)	13 (10.0)	35 (26.9)	41 (31.5)	31 (23.8)

Table 7. Predictors of pharmaceutical care practice among pharmacy professionals in Motta town, Northwestern Ethiopia, 2022 (n = 130).

Variables	Category	Good (%)	Poor (%)	COR (95% CI)	AOR (95% CI)
PC practice					
Sex	Female	45 (61.6)	26 (45.6)	0.52 (0.25–1.05)	0.55 (0.20–1.45)
	Male	28 (38.4)	31 (54.4)	1	1
Age	<30 years	24 (32.9)	32 (56.1)	0.48 (0.17–1.29)	0.68 (0.19–2.40)
	30–39 years	35 (47.9)	16 (28.1)	1.40 (0.50–3.92)	1.90 (0.46–7.85)
	>40 years	14 (19.2)	9 (15.8)	1	1
Current practicing area	Hospital pharmacy	55 (75.3)	33 (57.9)	2.22 (1.05–4.69)	2.76 (0.99–7.73)
	Community pharmacy	18 (24.7)	24 (42.1)	1	1
Years in practice	≤4 years	26 (35.6)	13 (22.8)	2.27 (0.99–5.22)	3.98 (1.28–12.42)*
	5–9 years	18 (24.7)	11 (19.3)	1.86 (0.75–4.58)	1.15 (0.35–3.79)
	≥10 years	29 (39.7)	33 (57.9)	1	1
Training status	B Pharm with new clinical-oriented curriculum	35 (48)	19 (33.3)	1.84 (0.89–3.77)	1.36 (0.47–3.90)
	B Pharm with the old curriculum	38 (52)	38 (66.6)	1	1
Marital status	Single	26 (35.6)	19 (33.3)	0.63 (0.21–1.87)	0.80 (0.19–3.24)
	Married	32 (43.8)	31 (54.4)	0.48 (0.17–1.34)	0.79 (0.20–3.07)
	Not lived with their partners (divorced, windowed)	15 (20.5)	7 (12.3)	1	1
Understanding of PC	Adequate	60 (82.2)	15 (26.3)	11.8 (5.15–27.03)	8.83 (3.25–23.96)*
	Inadequate	13 (17.8)	42 (73.7)	1	1
Attitude on PC	Favorable	25 (34.2)	42 (73.7)	0.18 (0.08–0.39)	0.39 (0.14–1.05)
	Unfavorable	48 (65.8)	15 (26.3)	1	1

*Statistically significant, based on the total practice score, pharmacists who scored median and above the median score of the correctly answered questions were classified as having good practice, while those who scored less than the median were deemed to have poor practice of PC.

these two concepts appear to be identical, they stress various aspects of practice. Clinical pharmacy is a science that deals with processes carried out by pharmacists with little concern for patient outcomes. In contrast, the PC is a system that explicitly mentions outcomes and is more concerned with relationship ethics between pharmacists and other healthcare professionals/patients.⁸

Only 15 (38.5%) of study subjects claimed that the patient's active cooperation is fundamental in the provision of pharmaceutical care, which is lower than studies conducted in Qatar (47.0%),²⁰ Thailand (81.5%),²⁸ Jamaica (71.1%), and China (80.9%).¹⁹ One of the essential steps in the PC process is to build a professional relationship between the pharmacist and the patient based on consideration, cooperation, communication, and shared decision-making. The patient's needs, desires, and responsibilities guide the interaction between the patient and the pharmacist.²⁹ Even though a therapeutic relationship is necessary to promote health and ensure the safe and effective use of medication, a limited number of participants were aware of PC as a patient-centered pharmacy practice. The discrepancy in pharmacy professionals' understanding might be explained by the slower adaptation and development of pharmaceutical care in Ethiopia,¹⁷ and the gap observed in the perception of the general public toward the new role of pharmacists.

More than half (54.6%) of the participants believe pharmacist in the PC process identifies and manage drug therapy problems. The finding was much lower as compared to

studies conducted in Qatar (91.0%),²⁰ Jordan (86.9%),³⁰ China (77.1%),¹⁹ and Jamaica (94.8%). In addition, more than half (56.9%) of participants were aware that pharmacists are responsible for patient health outcomes. The finding is consistent with the study done in Thailand (59.2%).²⁷ However, it was lower than studies conducted in Qatar (85.0%),²⁰ Jamaica (91.2%), and Macoa (70.0%).³¹ The discrepancy might be the difference in education and healthcare systems across countries, as well as individualized knowledge of PCs, so we recommend additional studies that explore the specific challenges faced by pharmacists in grasping the concept of pharmaceutical care.

In multivariate logistic regression, only training status held a statistically significant association with the level of understanding among respondents, and it showed that pharmacists trained in the new clinical-oriented curriculum were more likely to have adequate perception of PC (AOR = 3.77, 95% CI: 1.57–9.08). One cause could be the graduate courses from the old curriculum did not allow pharmacy professionals to have sufficient knowledge of PCs, rather it allowed pharmacy professionals to participate in medication consultation, drug supply, and compounding. On the contrary, the new clinical-oriented curriculum includes pharmacy practice and pharmaceutical care courses and has also a 1-year internship program that optimizes the pharmacy professionals' exposure to PC.³² Huang et al.,³³ reported that clerkship enhances pharmacy professionals' level of understanding and attitudes toward PC.

In this study, nearly half of the participants (48.5%) agreed with the myth that pharmaceutical care services should be offered by all pharmacists, which was much lower than studies done in Ethiopia (89.8%)²⁶ and Kuwait (90.4%),²³ but higher than studies done in China (36.8%).²⁰ It implicates a better perception of PC in Kuwait and Eastern Ethiopia than in the study area, and thus PC needs to be promoted by stakeholders in Motta Town. In our study, more than two-thirds of the respondents believe pharmacists' primary responsibility is delivering pharmaceutical care, similar to studies conducted in China (74.2%).¹⁹ In addition, 37% of study participants believe pharmaceutical care provision should go in the proper path. This finding is much lower than studies conducted in Jordan (91.4%),³⁶ Kuwait (86%),²³ and China (68.1%),¹⁹ so stakeholders should deliver instructions to pharmacists at the beginning of pharmaceutical care provision and control the external factors.²⁷

In multivariate logistic regression, only gender had a statistically significant association with attitude. Male pharmacists were more likely to have favorable attitudes (AOR=2.36, 95% CI: 1.08–5.17) than females. The result is inconsistent with the study done in New Zealand,³⁴ but supported by a study done in Nigeria³⁵ and by Cates et al.³⁶ The result might be explained by the female pharmacy professionals working in Motta town, is prohibited from freely interacting with health care professionals compared to males, so we recommend further study to find out specific reasons for gender differences in pharmacy professionals' attitudes toward pharmaceutical care.

Among study participants, (60.8%) frequently examine the patient and gather all the information required in case a recommendation is needed. This finding is in line with studies done in Qatar (57%)²⁰ and Jordan (64.6%),³⁰ furthermore 38.5% of participants frequently identify patient-specific health or drug therapy-related problem(s), similar to previous study reports from Jordan (35.8%), but lower than studies done in Qatar (52%).²⁰ In Ethiopia, direct patient care is still predominantly handled by doctors, and pharmacy professionals' involvement in patient care ultimately depends on physicians' willingness to accept the pharmacists' role.¹⁷ Twenty-three (17.7%) of the participants were involved in health screening activities. This finding is comparable with the studies done in Qatar (19%), China (20.9%), and Macoa (17%), but lower than the study done in Jordan (45.6%).³⁰ The discrepancy is explained by the lack of pharmacy associations that insist pharmacy professionals provide cognitive services and their incapacity to provide health screening services.²⁰

In multivariate logistic regression, year of practice and level of understanding were the factors associated with pharmaceutical care practice. It showed that participants with less than 5 years of experience (AOR = 3.98, 95% CI: 1.28–12.42) have good involvement in PC compared to participants with more than ten years of experience. Reports

have suggested that after completing a pharmacy program, fresh pharmacy professionals might demonstrate good self-efficiency, and belief, and start providing pharmaceutical care frequently, yet, after 5–10 years of practice they may deteriorate and start to exclusively support dispensing medications rather than providing patient care.³⁷ Additionally, a pharmacist with more experience may be reluctant to provide PC by confronting the inherent obstacles that could prevent them from doing so, and they are more likely to reflect on the difficulties involved in starting a new service.

Pharmacists who had an adequate understanding of PC were more likely to perform PC (AOR = 8.83, 95% CI: 3.25–23.96), comparable with the studies done in New Zealand.³³ A thorough understanding of PC is essential for pharmacists to identify drug therapy issues, execute pharmacotherapy, gain society's trust as professionals, and build therapeutic relationships with patients. As such, having a solid understanding of PC supports PC practice.²⁷ To provide high-quality PC service, pharmacists should be free from the traditional duties of selling drugs and given more time to address the actual patient's medication needs.³⁸ To support the professional transition, policymakers should recognize and support pharmacists in both community and hospital pharmacies as they navigate the conflict between serving as healthcare providers and retailers.³⁹

To the author's knowledge, this is the first empirical study about pharmacy professionals' understanding, attitude, and practice toward pharmaceutical care in both community and hospital pharmacy settings in the study area. This study provides an in-depth evaluation of the current state of pharmaceutical care in Motta town, Northwest Ethiopia. Furthermore, the study results also have the potential to direct future national initiatives by emphasizing important areas where pharmaceutical care provision can be improved, and thus achieve optimal patient outcomes and reduce healthcare costs. It also serves as a basis for further research projects in pharmaceutical care or related healthcare fields.

Since inadequate understanding and unfavorable attitudes toward PC are the main barriers to the implementation of pharmaceutical care, Amhara Health Bureau and other higher educational institutions should organize and deliver in-service training programs and workshops on PC to pharmacy professionals' and PC should be promoted by the bureaus as one area for ongoing professional development program. The Ethiopian Pharmaceutical Association also needs to promote pharmaceutical care and prepare its members for practice. Additionally, a study involving a higher number of participants and covering wider study areas supplemented with an in-depth interview could be sought to further investigate the underlying factors that impede the attitude, understanding, and practice of pharmacists toward pharmaceutical care and further explore the content and effectiveness of the training programs.

Limitations of the study

The following limitations should be considered when interpreting the study's findings: (i) Since the study design was cross-sectional, it is difficult to establish cause and effect relationship. (ii) Data were collected through a self-administered questionnaire, so the risk of bias is high. (iii) The instrument used to evaluate pharmacy practitioners' understanding, attitude, and practice of PCs was not validated. (iv) Several variables which are not covered in this study may influence pharmacy professional's knowledge, attitude, and practice toward pharmaceutical care. (v) A lower sample size and using a nonprobability sampling technique make the result lack generalizability to the whole country. Furthermore, a power analysis was not conducted during the sample size calculation.

Conclusion

The current study revealed that there is a gap in the understanding, attitude, and practice of pharmacy professionals toward pharmaceutical care. In multivariate analysis, males were more likely to have a positive attitude, and the overall understanding score was higher in those who had B.Pharm with a new clinical-oriented curriculum. Frequent pharmaceutical care provision is strongly associated with adequate understanding and less than 5 years of experience. Policymakers, health authorities, and educational institutions should work together to develop strategies and instructional initiatives that optimize pharmacy professionals' level of understanding, attitude, and practice and thus achieve optimal patient outcomes and lower healthcare costs.

Acknowledgements

The author would like to acknowledge pharmacy professionals working in Motta town, Northwest Ethiopia.

Authors' contribution

Conceptualization and data curation: Mekdes Kiflu, Sintayehu Simie Tsega. Data curation and investigation: Methodology: Mekdes Kiflu, Sintayehu Simie Tsega, Tilaye Arega Moges, Helen Abebaw Alem, and Melese Getachew. Software and validation: Mekdes Kiflu, Sintayehu Simie Tsega, Tilaye Arega Moges, Helen Abebaw Alem, and Melese Getachew. Writing and editing: All authors read and approve the manuscript.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Ethical considerations

We obtained ethical approval with (APPROVAL NUMBER/ID/147/01/14) from Debre Markos University, College of Health

Sciences, Department of Pharmacy. Privacy and confidentiality were ensured during the data collection period. Thus, the names and addresses of the participants were not recorded in the questionnaire, and data were collected unanimously. Written informed consent was taken from study participants before data collection. Participants were informed about the purpose of the study, why and how they were selected to be involved in the study, what was expected from them, and they could withdraw from the study at any time.

Informed consent


Every participant provided written informed consent. Written informed consent was obtained from all subjects before the study.

Trial registration

Since the study is observational, trial registration is not required.

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Supplemental material

Supplemental material for this article is available online.

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