

THE ROLE OF PHARMACISTS IN THE DEVELOPMENT OF PHARMACY PRACTICE

Albina Jusufi Xhaferri

Eurofarm pharmacy, North Macedonia, albinajusufi01@gmail.com

ORCID ID: 0009-0009-8924-6042

Katerina Ancevska Netkovska

Ss. Cyril and Methodius University in Skopje, Faculty of Pharmacy, North Macedonia,
kaan@ff.ukim.edu.mk

ORCID ID: 0000-0001-6934-9073

Aleksandra Grozdanova

Ss. Cyril and Methodius University in Skopje, Faculty of Pharmacy, North Macedonia,
agrozdanova@ff.ukim.edu.mk

ORCID ID: 0000-0002-0098-8691

Abstract: The pharmacy profession has undergone significant evolution over the past decades, shifting from its traditional role focused on the preparation and dispensing of medicines to a comprehensive, patient-centered model of healthcare. Today, pharmacists play a vital role in the rational use of medicines, monitoring pharmacotherapy, preventing adverse drug reactions, educating patients, and promoting public health. In the Republic of North Macedonia, the development of pharmacy practice has been shaped by changes in legislative regulations, healthcare system reforms, continuous professional education, and alignment with European standards. However, several challenges remain, including the insufficient integration of pharmacists into multidisciplinary healthcare teams, limited opportunities for the development of clinical pharmacy services, and the ongoing need to enhance professional knowledge and skills through continuous education.

The aim of this paper is to analyze the role of pharmacists in the development of modern pharmacy practice, with particular emphasis on the current situation in the Republic of North Macedonia, and to identify the opportunities and challenges for further improving the quality of pharmaceutical services and healthcare delivery to the population. As part of the research, a survey was conducted via Google Forms among pharmacists employed in various sectors, and the collected data was statistically processed and analyzed in order to obtain relevant results regarding the role of pharmacists in modern pharmaceutical practice.

Keywords: pharmacist, pharmacy practice, pharmaceutical care, healthcare system, professional development.

1. INTRODUCTION

Pharmacy practice is a significant segment of the healthcare system and encompasses professional activities directed towards the safe, effective and rational use of medicines. According to the contemporary concept, it is not limited to the dispensing of medicines but also includes pharmaceutical care, patient counselling, monitoring of pharmacotherapy, prevention of adverse reactions and active participation in interdisciplinary healthcare teams (Atkinson, 2022).

Historically, pharmacy practice was primarily focused on the preparation and dispensing of medicines. The introduction of the pharmaceutical care concept in the late twentieth century marked a major shift towards patient-centered care, expanding pharmacists' responsibilities to include medication review, optimization of therapy, prevention of drug-related problems and collaboration with other healthcare professionals. This historical evolution laid the foundation for contemporary clinical pharmacy services and the broader public health role of pharmacists. (Bou-Saba et al., 2022). A turning point is the concept of pharmaceutical care, which places the patient at the center of practice and emphasizes the pharmacist's responsibility for optimal therapeutic outcomes, while clinical pharmacy as a specialized field optimizes pharmacotherapy through collaboration with other healthcare professionals, including in the context of rare diseases (Cunico & Leite, 2023). The role also extends into public health through preventive programs, immunization and pharmacovigilance, including programs for tuberculosis elimination. (Cernasev et al., 2024)

In the Republic of North Macedonia, the profession is developing in line with European trends, yet challenges remain regarding the integration of pharmacists into healthcare teams and the development of clinical services. The aim of this paper is to analyse the role of pharmacists in the development of modern pharmacy practice in the country, to identify the factors that contribute to its advancement and the challenges encountered in daily work, and to propose recommendations.

2. MATERIALS AND METHODS

The research was designed as a quantitative, descriptive and cross-sectional study. It covered 85 graduate pharmacists holding a valid license to practice, employed in community and hospital pharmacies, wholesale

companies, the pharmaceutical industry and universities in the Republic of North Macedonia. Participation was voluntary and anonymous, and all 85 questionnaires were complete (validity rate 100 %).

The study used a structured 23-item questionnaire, with structure that allows calculation of composite Knowledge, Attitude, and Practice (KAP) scores and supports reliability testing, exploratory factor analysis, and multivariable regression, aligned with FIP frameworks for community pharmacists' involvement in pharmacy practice. It included demographic questions and attitude statements covering four main areas: the role of the pharmacist-D1, patient care- D2, professional development-D3, and challenges in practice- D4. It also included multiple-response questions and one open-ended question. Responses were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Data were collected electronically through Google Forms, and completion required approximately 5–10 minutes.

Descriptive statistics (frequencies, percentages, mean and standard deviation), an independent-samples t-test and Pearson correlation analysis were applied. Internal consistency was assessed using Cronbach's alpha. A value of $p < 0.05$ was considered statistically significant.

3. RESULTS

The sample was dominated by female respondents aged between 31 and 50 years, holding a master's degree and employed in a community pharmacy (Table 1).

Table 1. Demographic characteristics of the respondents (N = 85)

Variable	Category	f	%	Variable	Category	f	%
Gender	Female	68	80.0	Workplace	Community pharmacy	54	63.5
	Male	17	20.0		University	11	12.9
Age	Up to 30 years	19	22.4	Work experience	Hospital pharmacy	9	10.6
	31–40 years	29	34.1		Wholesale company	6	7.1
	41–50 years	23	27.1		Pharmaceutical industry	5	5.9
	51–60 years	10	11.8		Up to 5 years	21	24.7
Education	Over 60 years	4	4.7		6–10 years	31	36.5
	Graduate pharmacist	30	35.3		11–20 years	22	25.9
	Master's degree	42	49.4		Over 20 years	11	12.9
	Specialist	5	5.9				
	Doctor of science	8	9.4				

Source: Authors calculation

The following table (Table 2). presents the distribution of responses to the twenty attitude statements.

Table 2. Descriptive indicators for all 20 attitude statements (N = 85)

Statement	1	2	3	4	5	M	SD	% 4+5
I. ROLE OF THE PHARMACIST								
1. Key role in the contemporary healthcare system	4	7	13	8	53	4.16	1.23	71.8
2. The role is broader than dispensing medicines	2	4	9	39	31	4.09	0.93	82.4
3. Contributes to improving patients' health	1	2	12	31	39	4.24	0.87	82.4
4. Should be a member of the multidisciplinary team	1	0	12	24	48	4.39	0.82	84.7
5. Practice requires continuous professional development	1	0	7	21	56	4.54	0.75	90.6
II. CARE FOR PATIENTS								
6. I regularly counsel patients on the use of medicines	2	2	12	16	53	4.36	0.97	81.2
7. Patients trust the advice given by the pharmacist	1	1	16	32	35	4.16	0.86	78.8
8. Contributes to better adherence to therapy	2	0	12	29	42	4.28	0.88	83.5
9. Counselling reduces the risk of adverse effects	3	1	12	21	48	4.29	1.00	81.2
10. Pharmaceutical care should be mandatory in every pharmacy	1	3	8	18	55	4.45	0.89	85.9
III. PROFESSIONAL DEVELOPMENT								
11. I regularly attend professional education	2	2	15	38	28	4.04	0.91	77.6
12. Continuous education improves the quality of services	2	2	14	23	44	4.24	0.97	78.8
13. New technologies improve pharmacy practice	1	1	15	22	46	4.31	0.89	80.0
14. Digitalization facilitates the pharmacist's work	1	3	15	21	45	4.25	0.95	77.6
15. More opportunities for professional development are needed	1	0	8	26	50	4.46	0.76	89.4
IV. CHALLENGES IN PRACTICE								
16. Lack of time limits pharmaceutical care	2	5	17	19	42	4.11	1.07	71.8
17. Administrative duties reduce the time for patients	2	3	10	30	40	4.21	0.95	82.4
18. Legal amendments are needed to widen the role	1	1	13	29	41	4.27	0.85	82.4
19. Collaboration with physicians can be improved further	2	1	11	26	45	4.31	0.91	83.5
20. The profession will have an even greater role in the future	2	1	15	22	45	4.26	0.95	78.8

Source: Authors calculation

1 = strongly disagree ... 5 = strongly agree; % 4+5 = percentage of agreement (responses 4 and 5).

Ratings are uniformly high across all four thematic areas, and no statement falls below 4.00. The individual statements are therefore aggregated into composite scores, whose internal consistency is examined in the (Table 3).

Table 3. Composite scores by dimension and internal consistency (N = 85)

Dimension	Items	M	SD	Cronbach's α
D1 — Role of the pharmacist	5	4.28	0.71	0.817
D2 — Care for patients	5	4.31	0.71	0.831
D3 — Professional development	5	4.26	0.67	0.796
D4 — Challenges in practice	5	4.23	0.70	0.794
Overall score	20	4.27	0.62	0.935

Source: Authors calculation

The four dimensions are close in level and each attains acceptable reliability, which justifies the use of the composite scores in further analysis. The (Table 4). compares these scores across the demographic subgroups.

Table 4. Independent-samples t-test - all comparisons (df = 83)

Comparison	Dimension	Group 1 (M $\pm$ SD)	Group 2 (M $\pm$ SD)	t	p	d
Gender	D1	4.37 $\pm$ 0.71	3.94 $\pm$ 0.61	2.283	0.025*	0.62
F = 68	D2	4.35 $\pm$ 0.73	4.15 $\pm$ 0.63	1.020	0.311	0.28
M = 17	D3	4.28 $\pm$ 0.69	4.15 $\pm$ 0.59	0.714	0.477	0.19
	D4	4.29 $\pm$ 0.72	3.99 $\pm$ 0.58	1.601	0.113	0.43
	Overall	4.32 $\pm$ 0.64	4.06 $\pm$ 0.48	1.586	0.117	0.43
Experience	D1	4.40 $\pm$ 0.59	4.10 $\pm$ 0.84	1.973	0.052	0.44
≤ 10 y. = 52	D2	4.42 $\pm$ 0.61	4.13 $\pm$ 0.83	1.853	0.067	0.41
> 10 y. = 33	D3	4.33 $\pm$ 0.56	4.15 $\pm$ 0.81	1.227	0.223	0.27
	D4	4.28 $\pm$ 0.63	4.15 $\pm$ 0.81	0.887	0.378	0.20
	Overall	4.36 $\pm$ 0.50	4.13 $\pm$ 0.76	1.677	0.097	0.37
Workplace	D1	4.51 $\pm$ 0.68	3.90 $\pm$ 0.60	4.168	$< 0.001^{***}$	0.94
Pharmacy = 54	D2	4.50 $\pm$ 0.71	3.98 $\pm$ 0.59	3.435	0.001**	0.77
Other = 31	D3	4.46 $\pm$ 0.65	3.90 $\pm$ 0.54	4.022	$< 0.001^{***}$	0.91
	D4	4.38 $\pm$ 0.71	3.97 $\pm$ 0.61	2.704	0.008**	0.61
	Overall	4.46 $\pm$ 0.61	3.94 $\pm$ 0.49	4.087	$< 0.001^{***}$	0.92

Source: Authors calculation

Group 1 = female / up to 10 years / community pharmacy; Group 2 = male / over 10 years / other sectors. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; d = Cohen's d.

The comparison covers gender, length of service and workplace for each dimension and for the overall score. The relationships between the dimensions themselves, and their association with age and experience, are presented in the (Table 5).

Table 5. Correlation analysis (Pearson coefficient, N = 85)

Variable	D1	D2	D3	D4	Overall
D1 - Role of the pharmacist	1.000	-	-	-	0.909***
D2 -Care for patients	0.787***	1.000	-	-	0.893***
D3 - Professional development	0.732***	0.765***	1.000	-	0.899***
D4 - Challenges in practice	0.707***	0.620***	0.713***	1.000	0.855***
Age (coded 1-5)	-0.364**	-0.302**	-0.336**	-0.231*	-0.347**
Work experience (coded 1-4)	-0.218*	-0.183	-0.162	-0.098	-0.186

Source: Authors calculation

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

The matrix shows the associations among the four dimensions and between them and the demographic variables. The final (Table 6.) turns from attitudes to the activities pharmacists perform and to the barriers they report.

Table 6. Activities performed and reported barriers (multiple responses possible, N = 85)

Most frequently performed activities	f	%	Limiting factors	f	%
Patient counselling	55	64.7	Insufficient staff	50	58.8
Dispensing medicines	54	63.5	Lack of time	43	50.6
Monitoring of therapy	48	56.5	Limited collaboration with physicians	41	48.2
Pharmacovigilance	23	27.1	Insufficient education	32	37.6
Blood pressure measurement	22	25.9	Legal restrictions	31	36.5
Administrative work	4	4.7			

Source: Authors calculation

The findings from all six tables are discussed together in the following section.

4. DISCUSSION

The results show a consistently high level of agreement with all statements examined ($M = 4.27$, $SD = 0.62$); none of the twenty statements fell below 4.00, and the questionnaire displayed excellent internal consistency ($\alpha = 0.935$). The highest rating was recorded for the need for continuous professional development ($M = 4.54$), whereas respondents' own regular attendance at educational activities received the lowest rating ($M = 4.04$). The difference of 0.50 points to structural obstacles rather than to a lack of motivation. In other countries, organized national programs of continuing professional development have proved to be the key mechanism for bridging this gap (Apikoglu et al., 2022).

The most notable finding was the difference according to workplace, with community pharmacists achieving significantly higher scores across all four dimensions: the role of the pharmacist, patient care, professional development, and challenges in practice ($t = 4.087$; $p < 0.001$; $d = 0.92$, indicating a large effect size). This may be related to their frequent patient interactions and direct involvement in pharmaceutical care. Similar findings have been reported in previous studies on community pharmacists' attitudes (Siddique et al., 2022).

By gender, a significant difference was found only for dimension D1 ($p = 0.025$), however, the unequal group sizes should be considered when interpreting this finding. By length of service, no difference reached the threshold of significance, but the p -value for D1 ($p = 0.052$), combined with a moderate effect size ($d = 0.44$), suggests a meaningful trend that did not reach statistical significance in the present sample.

All dimensions showed strong positive correlations ($r = 0.620$ – 0.787 ; $p < 0.001$). The strongest relationship was found between professional role perception and pharmaceutical care ($r = 0.787$), indicating that these two areas are closely related and represent important aspects of pharmacists' professional attitudes. Age is significantly negatively associated with the overall score ($r = -0.347$; $p = 0.001$), while correlations with length of service are weaker and mostly non-significant, which suggests that the key factor is a generational difference in education rather than time spent in the profession as such.

The multiple-response data are consistent with the Likert-scale findings: insufficient staff (58.8%), lack of time (50.6%), and limited collaboration with physicians (48.2%) correspond to the high scores for statements 16, 17, and 19, providing internal validation through two independent approaches. The same limitations have been identified as global barriers to good community pharmacy practice (Bou-Saba et al., 2022). Counselling (64.7%) exceeds medicine dispensing (63.5%), indicating the ongoing transformation of the profession. However, pharmacovigilance (27.1%) and blood pressure measurement (25.9%) remain limited, with only about one-quarter of respondents reporting involvement in these activities.

These findings indicate that pharmacists recognize the importance of an expanded professional role but continue to face organizational barriers that limit the implementation of pharmaceutical care. The strong agreement regarding continuous professional development reflects awareness that maintaining clinical competencies is essential for improving patient outcomes. Likewise, the pronounced differences between community pharmacists and respondents from other sectors suggest that direct patient contact strengthens professional identity and reinforces patient-centered practice.

Limitations. The sample was one of convenience and limited in size, the comparison groups were unbalanced, the data are self-reported, and the cross-sectional design does not permit conclusions about cause-and-effect relationships.

5. CONCLUSIONS

Pharmacists in North Macedonia demonstrated a high level of awareness of the expanded role of the pharmacy profession. Workplace was identified as the strongest factor influencing attitudes, whereas older age was associated with less positive perceptions. The findings also showed that different aspects of the expanded professional role were closely connected. The main barriers to providing extended pharmaceutical services were insufficient personal staffing, limited time, and inadequate collaboration with physicians.

Based on these results, it is recommended to improve pharmacy practice, reduce administrative workload through digitalization, strengthen cooperation with physicians, expand access to flexible continuing education, and update the legal framework to support a wider range of pharmaceutical services. These measures could contribute to the further development of patient-oriented pharmaceutical care and the effective integration of pharmacists into healthcare system.

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