

Understanding, practice and barriers to pharmaceutical care among community pharmacists in Peshawar, Pakistan: a pilot cross-sectional survey

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Abstract

Background: Pharmaceutical care reorients pharmacy practice from product supply towards responsible, patient-centered management of drug therapy. In many low- and middle-income countries its uptake in community pharmacies remains limited, and Pakistani data are scarce. Conducted a pilot survey to characterize the field and to inform a subsequent, adequately powered study.

Objective: To assess, in a pilot cohort, community pharmacists’ understanding of pharmaceutical care, the frequency with which they provide its component activities, their attitudes towards it, and the barriers to its implementation in Peshawar, Pakistan.

Methods: A pilot cross-sectional survey was undertaken in November 2025 using a pre-tested, 34-item self-completion questionnaire spanning demographics, understanding, frequency of provision, attitudes and barriers (Likert-scaled). Questionnaires were distributed to 90 practicing pharmacists across 60 community pharmacies in southern and central Peshawar; 62 usable responses were analyzed. Internal consistency of the Likert subscales was assessed by Cronbach’s α . Data were summarized descriptively in SPSS v22, with Wilson 95% confidence intervals (CIs) for key proportions. The sample size required for a definitive study was estimated using Cochran’s formula. Reported in accordance with STROBE.

Results: Of 90 questionnaires, 62 were returned in usable form (68.9%; 95% CI 58.7–77.5). Respondents were predominantly male (79.0%) and aged 20–30 years (87.1%),

with 80.6% having 1–5 years' experience. Endorsement of the aim of pharmaceutical care was high (93.4%; 95% CI 84.6–97.5), but only 69.4% (95% CI 57.0–79.4) correctly endorsed its definition and 77.4% wrongly agreed it is “just a medication-counselling service”, indicating conceptual confusion. Prescription checking (95.1%) and directions for use (90.2%) were commonly provided, whereas monitoring of adverse drug reactions and adherence was reported by only 46.8% (95% CI 34.9–59.0). Attitudes were generally favorable. The most strongly perceived barriers were slow implementation of pharmacy laws (91.9%; 95% CI 82.5–96.5), health-system structure (75.8%) and inter-professional resistance, clinical-education and skills gaps (each ~71–74%).

Conclusion: In this pilot cohort, community pharmacists showed partial understanding of pharmaceutical care and delivered only selected elements of it, remaining anchored in dispensing and counselling. Legislative reform, targeted clinical education, remuneration mechanisms and inter-professional collaboration are needed to advance pharmaceutical care in Pakistan.

1. Introduction

Pharmaceutical care, first articulated by Hepler and Strand in 1990, is “the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient’s quality of life”.¹ It reframes the pharmacist’s work around identifying, resolving and preventing drug therapy problems, rather than around the supply of a product, and positions the pharmacist as accountable for the outcomes of medicines use.^{1,2} The World Health Organization’s “seven-star pharmacist” - caregiver, decision-maker, communicator, leader, manager, life-long learner and teacher - captures the breadth of this expanded role.³

Across high-income health systems the pharmacist’s remit has moved decisively from dispensing towards cognitive, patient-facing services: independent and supplementary prescribing in the United Kingdom, medication-review programmes in Canada and Australia, and the separation of prescribing and dispensing in the Republic of Korea are illustrative.^{4,5} These developments rest on evidence that unresolved drug therapy problems are common, costly and frequently preventable,

and that pharmacist-led review can reduce drug-related morbidity, mortality and expenditure.^{2,6}

In many low- and middle-income countries, by contrast, community pharmacies remain oriented towards medicine distribution. A shortage of qualified pharmacists, weak enforcement of prescription-only-medicine regulation, the sale of prescription medicines over the counter, and limited counselling all constrain the quality of care delivered at the point of supply.^{7,8,9} Pakistan exemplifies these challenges: studies of public-sector facilities and community pharmacies have documented deficient dispensing and counselling practices and an under-used pharmacy workforce.^{7,8,10}

Where pharmaceutical care has been introduced internationally, implementation has been impeded by recurring barriers - insufficient time, absence of remuneration for cognitive services, gaps in therapeutic knowledge and problem-solving skills, and limited support from other health professionals - described in the Netherlands, Denmark, Sweden, Germany, Canada, New Zealand, Thailand and Brazil.^{11,12,13,14} Whether the same constellation operates in Pakistan, and how community pharmacists here understand and practice pharmaceutical care, has been little studied.

Understanding practitioners' conceptions, current activities and perceived obstacles is a necessary first step before services can be designed and scaled. We therefore surveyed community pharmacists in Peshawar to characterize their understanding of pharmaceutical care, the frequency with which they provide its component activities, their attitudes towards it, and the barriers they perceive to its implementation. We hypothesized that understanding would be partial and practice concentrated on traditional dispensing functions, with structural and educational factors dominating the perceived barriers.

2. Materials and Methods

2.1. Study design and setting

A pilot, cross-sectional, questionnaire-based survey of practicing community pharmacists was conducted in Peshawar — the capital of Khyber Pakhtunkhwa province, Pakistan — in November 2025. The study was designed as an exploratory pilot to characterize understanding, practice and barriers, to test the survey

instrument in the local setting, and to inform the design and sample size of a subsequent definitive study. It is reported in accordance with the STROBE statement for cross-sectional studies.

2.2. Study instrument

A 34-item, self-completion questionnaire was developed in English from the Hepler–Strand pharmaceutical-care model and adapted to local practice through discussion with, and review by, the academic supervisor; it was pre-tested before fielding.¹ The instrument comprised five sections: (i) demographics (sex, age, years of experience, type of practice, post held); (ii) six statements on the concept, purpose and function of pharmaceutical care, of which two were deliberately false to probe genuine understanding; (iii) nine statements on the frequency of pharmaceutical-care activities; (iv) seven statements on attitudes; and (v) twelve statements on barriers to provision. Items in sections (ii)–(v) were rated on a five-point Likert scale (1 = strongly agree to 5 = strongly disagree; and 1 = always to 5 = never for frequency).

2.3. Validity and reliability

Content validity was addressed through construction from an established conceptual model and expert review; face validity and clarity were checked in pre-testing. The inclusion of two reverse-scored false items provided an internal check against acquiescence bias. Internal consistency of each multi-item Likert subscale (understanding, frequency of provision, attitudes and barriers) was quantified by Cronbach's α , with $\alpha \geq 0.70$ taken as acceptable; as a pilot, values are interpreted as provisional and full psychometric evaluation, including exploratory factor analysis, is reserved for the definitive study.

2.4. Population, sampling and sample size

The sampling frame comprised community pharmacies in southern and parts of central Peshawar. Questionnaires were distributed to 90 practicing pharmacists across 60 community pharmacies, and 62 usable responses were obtained.

This pilot enrolled the 62 pharmacists who returned usable questionnaires; no minimum sample size was pre-specified, consistent with its exploratory, instrument-testing purpose. The sample size required for the subsequent definitive survey was estimated from Cochran's formula, $n_0 = Z^2pq/e^2$. With $Z = 1.96$, an assumed maximal-

variability proportion $p = 0.5$ ($q = 0.5$) and a $\pm 5\%$ margin of error ($e = 0.05$), $n_o = (1.96^2 \times 0.5 \times 0.5)/0.05^2 \approx 384$; a finite-population correction would reduce this where the total number of community pharmacists is known. This figure also satisfies a subjects-to-item ratio of roughly 10:1 for factor analysis of the 34-item instrument. Accordingly, a definitive multi-centre study recruiting approximately 384 pharmacists is recommended (Section 4.4), for which the present pilot provides the instrument, effect-size context and feasibility data.

2.5. Data collection and ethics

Questionnaires were delivered and collected in person to maximize the response rate. Participation was voluntary and anonymous, written informed consent was obtained before participation, and the study was conducted in accordance with the principles of the Declaration of Helsinki and applicable WHO research guidance.

2.6. Statistical analysis

Data were analyzed in IBM SPSS Statistics v22. Responses were summarized descriptively as frequencies, percentages and mean \pm standard deviation (SD) of Likert scores; the proportions agreeing or strongly agreeing (or reporting an activity “always/sometimes”) are reported for each item, with Wilson score 95% confidence intervals (CIs) for the principal proportions. Where a respondent did not complete a section, that response was treated as missing and excluded item-wise; denominators reflect available cases. No formal hypothesis testing was undertaken, consistent with the descriptive objectives.

3. Results

3.1. Participant flow and instrument reliability

Of 90 questionnaires distributed to pharmacists across 60 community pharmacies, 62 were returned in usable form and 28 were not returned or were incomplete, giving a response rate of 68.9% (95% CI 58.7–77.5) (Figure 1).

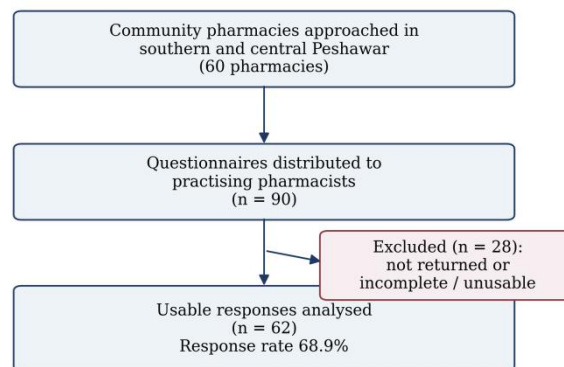


Figure 1. Participant flow through the study (STROBE). Of 90 questionnaires distributed across 60 community pharmacies, 62 usable responses were analysed.

3.2. Respondent characteristics

Respondents were predominantly male (49; 79.0%) and young: 54 (87.1%) were aged 20–30 years and none was older than 40 years (Table 1). Most were early-career, with 50 (80.6%) reporting 1–5 years' experience. Chain pharmacies employed the majority (39; 62.9%), and 38 respondents (61.3%) worked principally in prescription checking, with a further 18 (29.0%) in managerial posts.

Table 1. Demographic characteristics of respondents (n = 62).

Characteristic	n	%	Mean ± SD ^a
Sex			1.21 ± 0.41
Male	49	79.0	
Female	13	21.0	
Age band (years)			1.13 ± 0.34
20–30	54	87.1	
30–40	8	12.9	
40–50 / > 50	0	0	
Experience (years)			1.26 ± 0.60
1–5	50	80.6	
5–10	9	14.5	
10–15	2	3.2	
> 20	1	1.6	
Type of practice			1.81 ± 0.70

Characteristic	n	%	Mean ± SD ^a
Independent pharmacy	19	30.6	
Chain pharmacy	39	62.9	
Supermarket pharmacy	1	1.6	
Other	3	4.8	
Post held			1.55 ± 0.84
Prescription checks	38	61.3	
Managerial position	18	29.0	
Owner of pharmacy	4	6.5	
Quality assurance	2	3.2	

^a Mean ± SD of the coded response category, reproduced from the source dataset. SD, standard deviation.

3.3. Understanding of pharmaceutical care

Understanding was uneven (Table 2). While 93.4% (95% CI 84.6–97.5) endorsed the aim of pharmaceutical care and around 98% recognized its feedback and patient-help functions, only 69.4% (95% CI 57.0–79.4) correctly endorsed the formal definition. Crucially, the two false items exposed conceptual confusion: 77.4% wrongly agreed that pharmaceutical care is “just a medication-counselling service”, and agreement with the statement that the pharmacist plays only a secondary role was near chance (43.5%; mean 3.00), indicating that many respondents did not clearly locate their own accountability within the process.

Table 2. Understanding of pharmaceutical care (n = 62).

Statement	Agree/strongly agree (%)	Mean	SD
1. Pharmaceutical care is the responsible provision of drug therapy	69.4	2.48	0.97
2. Its aim is safe, effective, economical, rational medicines use	93.4	1.72	0.71
3. It is just a medication-counselling service ^b	77.4	1.85	1.08
4. It provides feedback to optimise drug use	98.4	1.42	0.53
5. All patients taking medicines require pharmacists' help	98.4	1.23	0.42
6. The pharmacist plays a secondary role in the process ^b	43.5	3.00	1.39

^b *Deliberately false item; high agreement indicates misunderstanding. Lower mean scores denote stronger agreement (1 = strongly agree).*

3.4. Frequency of pharmaceutical-care activities

Reported practice concentrated on supply-related tasks (Table 3). Prescription checking (95.1%) and provision of directions for administration, dosage and precautions (90.2%) were near-universal, as were general information provision (90.2%) and communication in the counselling area (90.2%). By contrast, only 46.8% (95% CI 34.9–59.0) reported monitoring adverse drug reactions and adherence — a core clinical function — and personal medication records were maintained by 67.7%. Health-education activities were reported by most within the pharmacy (83.9%) but by fewer beyond it (69.4%), indicating limited engagement in community-level health promotion.

Table 3. Perceived frequency of pharmaceutical-care activities (n = 62).

Activity	Always/sometimes (%)	Mean	SD
1. Communicate with patients in the counselling area	90.2	1.75	0.77
2. Perform prescription check	95.1	1.70	0.56
3. Give directions for administration, dosage, precautions	90.2	2.03	2.58
4. Monitor adverse drug reactions and adherence	46.8	2.60	1.25
5. Health screening (e.g. blood-pressure measurement)	88.7	1.85	0.83
6. Create a personal medication record	67.7	2.32	1.24
7. Conduct health education for patients	83.9	1.90	0.94
8. Provide general health and medication information	90.2	1.75	0.67
9. Promote drug-safety knowledge outside the pharmacy	69.4	2.15	0.92

Lower mean scores denote more frequent provision (1 = always). The elevated SD for item 3 is reproduced from the source dataset.

3.5. Attitudes towards pharmaceutical care

Attitudes were consistently favorable (Table 4). Nearly all respondents regarded safeguarding patients' health as their primary responsibility (93.5%) and endeavored to provide suitable medicines (98.4%), and most derived job satisfaction from

providing pharmaceutical care (91.9%). Notably, however, the item attracting least agreement concerned enabling conditions: only 62.9% (95% CI 50.5–73.8) agreed that they would like to provide pharmaceutical care but lacked the basic working conditions to do so - foreshadowing the structural barriers examined next.

Table 4. Attitudes towards pharmaceutical care (n = 62).

Statement	Agree/strongly agree (%)	Mean	SD
1. Maintaining patients' health is my primary responsibility	93.5	1.53	0.72
2. I try my best to provide suitable medicines	98.4	1.34	0.57
3. I consider patients' economic situation when providing care	93.5	1.53	0.62
4. I could provide more comprehensive care than at present	82.3	1.94	0.88
5. I would provide care but lack basic working conditions	62.9	2.39	1.14
6. Providing pharmaceutical care gives me job satisfaction	91.9	1.74	0.70
7. Patients look forward to my provision of care	80.6	1.81	0.79

Lower mean scores denote stronger agreement (1 = strongly agree).

3.6. Barriers to provision

The most strongly perceived barrier was the slow implementation of pharmacy legislation (91.9%; 95% CI 82.5–96.5), followed by the structure of the Pakistani health-care system (75.8%; 95% CI 63.8–84.8) and resistance from other health professionals (74.2%) (Table 5, Figure 2). Educational and skills deficits featured prominently — lack of clinical education (74.2%), pharmacist attitude (74.2%) and clinical problem-solving skills (71.0%) — while absence of a reimbursement system (59.6%; 95% CI 47.3–71.0) and of documentation skills (58.1%) were also frequently endorsed. These items cluster conceptually into four domains: deficient external/enabling conditions, skills gaps, absent information and economic incentives, and limited inter-professional support.

Table 5. Perceived barriers to pharmaceutical-care provision (n = 62).

Barrier	Agree/strongly agree (%)	Mean	SD
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Barrier	Agree/strongly agree (%)	Mean	SD
1. Health-care structure in Pakistan	75.8	1.92	0.91
2. Slow implementation of pharmacy laws	91.9	1.61	0.73
3. Resistance from other health professionals	74.2	1.94	0.96
4. Lack of interest of pharmacy owner	51.6	2.58	1.25
5. Lack of patient acceptance of care	62.9	2.45	1.07
6. Lack of proper space/area	56.5	2.58	1.24
7. Lack of a reimbursement system	59.6	2.40	0.98
8. Lack of proper clinical education	74.2	2.13	1.02
9. Lack of clinical problem-solving skills	71.0	2.27	1.03
10. Pharmacist attitude towards care	74.2	2.29	1.05
11. Lack of documentation/management skills	58.1	2.55	1.04
12. Lack of vision on professional development	64.5	2.52	1.25

Lower mean scores denote stronger agreement (1 = strongly agree). A formal exploratory factor analysis of these items is deferred to the larger confirmatory study (Section 4.4).

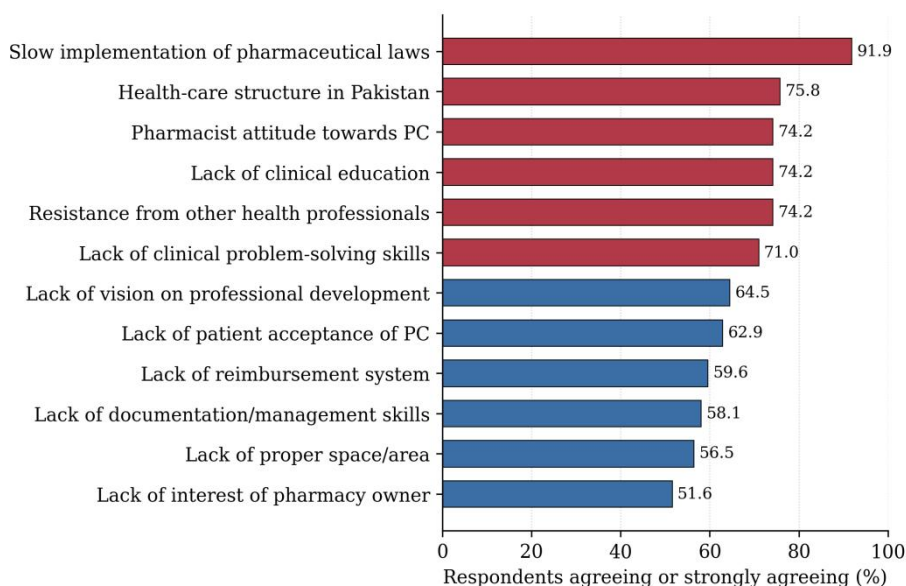


Figure 2. Perceived barriers to pharmaceutical-care provision, ranked by the proportion of community pharmacists agreeing or strongly agreeing (n = 62). Bars in the darker shade denote barriers endorsed by ≥ 70% of respondents.

4. Discussion

This cross-sectional survey of community pharmacists in Peshawar found a workforce that is broadly sympathetic to pharmaceutical care yet only partially

understands it and practices a limited subset of its activities. High endorsement of aims coexisted with misconception of the concept - most strikingly, more than three-quarters equated pharmaceutical care with medication counselling - and day-to-day work remained anchored in dispensing and directions for use, with clinical monitoring and community health promotion comparatively neglected.

4.1. Understanding and practice

The dissociation between endorsing the goals of pharmaceutical care and grasping its definition mirrors findings from other transitioning settings, where enthusiasm outpaces conceptual clarity and role identity.^{13,15} The performance of the two false items is informative: near-chance agreement that the pharmacist plays only a secondary role suggests that accountability - the defining feature of pharmaceutical care - is not yet internalised. Practically, respondents behaved as competent dispensers who counsel, rather than as clinicians who assess, monitor and follow up; the low rate of adverse-reaction and adherence monitoring (46.8%) is the clearest expression of this gap and is consistent with the supply-centred model that predominates across South Asian community pharmacy.^{9,16}

4.2. Attitudes and enabling conditions

Favourable attitudes are an asset for reform: pharmacists reported patient-centred intentions and derived satisfaction from providing care. Yet the item attracting least agreement concerned working conditions, signalling that intention is constrained by environment rather than motivation. This pattern - willing practitioners in unsupportive systems - recurs internationally and points to structural rather than dispositional solutions.^{12,13}

4.3. Barriers in comparative perspective

The dominance of legislative and structural barriers distinguishes this setting from high-income systems, where time and remuneration typically head the list.^{11,12} That slow implementation of pharmacy law was the single most-endorsed barrier (91.9%) implicates the regulatory environment as the primary lever for change in Pakistan, with health-system structure and inter-professional resistance close behind. Educational and skills deficits - clinical training, problem-solving and documentation - formed a second, internal cluster amenable to curricular and continuing-education

intervention, while absence of remuneration (59.6%) echoes a near-universal obstacle to cognitive pharmacy services.^{13,14} The four conceptual domains identified here - enabling conditions, skills, information and incentives, and inter-professional support - align closely with barrier structures reported from China, Thailand and New Zealand, suggesting shared determinants across developing and reforming systems.^{13,14,15}

4.4. Strengths, limitations and future research

As a deliberately exploratory pilot, this study is best judged by whether it delivers a tested instrument, feasibility evidence and effect-size context for a definitive survey - which it does. Its strengths include a theory-based, pre-tested instrument, embedded false items to detect acquiescence, and in-person administration that secured a 68.9% response rate. The principal limitation, inherent to the pilot design, is the modest, geographically confined sample of 62 respondents drawn from parts of one city, which limits precision and generalisability and precludes robust multivariate analysis; the four barrier domains are therefore advanced as conceptual rather than statistically derived factors. Self-report may also inflate socially desirable responses, and the young, early-career profile of respondents may not represent more experienced practitioners. Accordingly, the planned definitive study should recruit approximately 384 pharmacists - consistent with the Cochran estimate in Section 2.4 - sampling multiple cities and practice types, and incorporating formal reliability testing and exploratory factor analysis.

4.5. Implications

The findings translate into a concrete reform agenda. Because the leading barriers are legislative and structural, advancing pharmaceutical care in Pakistan will depend less on exhorting individual pharmacists — who are already willing — than on enacting and enforcing enabling regulation, funding cognitive services, embedding clinical and documentation competencies in education, and building collaborative relationships with prescribers.^{7,10,17}

5. Conclusion

Community pharmacists in Peshawar understood pharmaceutical care only partially and delivered a restricted set of its activities, remaining rooted in dispensing and

counselling despite favourable attitudes. The barriers they perceived were led by slow implementation of pharmacy legislation, health-system structure, inter-professional resistance and gaps in clinical education and remuneration. Overcoming these will require coordinated legislative, educational, financial and collaborative action; a larger multi-centre study is needed to confirm these exploratory findings and to model the barrier structure robustly.

6. Recommendations

- Clinical: reorient community practice beyond dispensing to include structured adverse-reaction and adherence monitoring, medication records and documented follow-up.
- Educational: strengthen clinical, problem-solving and documentation competencies in pharmacy curricula and through accredited continuing-education programmes.
- Research: undertake a multi-city confirmatory survey of \approx 300–385 pharmacists with reliability testing and factor analysis to validate the barrier structure.
- Hospital/organisational: create enabling working conditions - counselling space, staffing and workflow — and pilot pharmacist-led cognitive services with defined outcomes.
- Policy: prioritise timely implementation and enforcement of pharmacy legislation and establish a reimbursement mechanism for cognitive pharmaceutical services.

Declarations

Ethics approval and consent to participate. The study was conducted in accordance with the Declaration of Helsinki and applicable WHO research guidance. Participation was voluntary and anonymous, and written informed consent was obtained from all respondents before participation.

Consent for publication. Not applicable.

Availability of data and materials. The anonymised dataset and questionnaire are available from the corresponding author on reasonable request.

Competing interests. The authors declare no competing interests.

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