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Research Article

IMPACT OF PHARMACIST COUNSELING ON PEPTIC ULCER DISEASE PATIENTS BASED ON EVIDENCE FROM SERVQUAL EVALUATION

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ABSTRACT

Objective: Pharmacist counseling is a crucial component of pharmaceutical care, contributing to improved patient understanding and satisfaction with care. However, comprehensive evaluation of the impact of pharmacist counseling on patient satisfaction across service-quality dimensions remains limited, particularly for common conditions such as peptic ulcer disease (PUD).

This study aimed to analyze the influence of pharmacist counseling on patient satisfaction levels based on the five ServQual dimensions: Tangibles, reliability, responsiveness, assurance, and empathy, in patients with PUD.

Methods: This study used a pre–post study design with adult patients with a diagnosis of PUD who filled prescriptions at the study pharmacy. The research instrument was a 21-item ServQual questionnaire covering sociodemographic characteristics and patient satisfaction statements. Data were analyzed descriptively and inferentially to compare patient expectations and perceptions before and after counseling.

Results: All service quality (ServQual) dimensions showed significant improvements in patient expectations and perceptions after pharmacist counseling, with post-counseling perception scores ranging from 95% to 99%, and all differences were statistically significant ($p<0.05$). The greatest improvement was observed in the empathy and assurance dimensions, reflecting improvements in interaction quality and patient trust in pharmacists' care.

Conclusion: Pharmacist counseling significantly improved patient satisfaction with pharmacy services across all dimensions of ServQual. These findings underscore the importance of integrating structured pharmacist counseling into pharmacy practice to enhance ServQual and the patient experience.

Keywords: Pharmacist counseling, Patient satisfaction, Peptic ulcer disease, Service quality.

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INTRODUCTION

Peptic ulcer disease (PUD) is a significant global health problem, contributing to high hospitalization rates and healthcare resource utilization in many countries [1,2]. This disease commonly affects the stomach and proximal duodenum due to mucosal damage triggered by gastric acid, potentially leading to serious complications such as bleeding and perforation. Peptic ulcers are classified as upper gastrointestinal disorders caused by excessive secretion of gastric acid and pepsin by the gastric mucosa, thereby disrupting mucosal defense mechanisms.

Several risk factors include *Helicobacter pylori* infection, use of nonsteroidal anti-inflammatory drugs, smoking, alcohol consumption, and unhealthy diets, such as instant food consumption [2-4]. The complexity of these causative factors not only increases disease incidence but also complicates therapeutic management, necessitating rational pharmacotherapy and adequate patient education [5-8]. Although the evaluation of therapeutic rationality showed accuracy of indications, patient selection, drug selection, and dosage remained relatively low [9-11], indicating that there is still room to improve the quality of pharmaceutical services [12,13].

In the context of pharmaceutical services, pharmacists are required to continuously improve their knowledge, skills, and professional behavior to interact directly with patients, including providing drug information and counseling. Various studies have shown that peptic ulcer patients need pharmaceutical counseling [14,15]. Pharmacist counseling is a two-way communication process between pharmacists and patients that provides information, education, and guidance on the safe and effective use of medications, thereby improving adherence and preventing medication errors [10,11,16-18].

In addition to impacting clinical outcomes, pharmacist counseling has also been shown to improve patients' quality of life, particularly in the physical and environmental domains [19-21]. Pharmacists play a crucial role in optimizing drug therapy during patient care. Through counseling, pharmacists help improve patient understanding, awareness, and treatment adherence, ultimately encouraging positive behavioral changes in medication use. Furthermore, counseling also benefits the profession and the development of pharmacy, including implementing pharmaceutical care services, enhancing the professional image of pharmacists as part of the healthcare team, and serving as a value-added service that can increase patient satisfaction and loyalty [22].

Patient satisfaction is a key indicator in assessing the quality of healthcare services, including pharmaceutical services in pharmacies. One widely used method for measuring patient satisfaction is the service quality (ServQual) model [23,24]. The ServQual method measures ServQual based on the gap between patient expectations and perceptions of the service received, encompassing five key dimensions: Tangibles, reliability, responsiveness, assurance, and empathy. The ServQual model also identifies five gaps in service, where the gap

between patient expectations and perceptions is a key determinant of overall service satisfaction [23].

Although the role of pharmacists in patient-centered care is increasingly recognized, research specifically evaluating the effect of pharmacist counseling on patient satisfaction with peptic ulcer treatment in pharmacies, particularly using a pre- and post-counseling approach with the ServQual method, remains limited. Therefore, this study aims to analyze the effect of pharmacist counseling on patient satisfaction with peptic ulcer treatment using the ServQual method, comparing pre- and post-counseling satisfaction. The results of this study are expected to inform efforts to improve the quality of pharmaceutical counseling services and to strengthen pharmacists' roles in health services oriented toward patient needs and satisfaction.

METHOD

Research design and setting

This study employed a descriptive, single-group pre-test/post-test quasi-experimental study using intervention-based evaluation of pharmacist counseling [25,26]. The study was conducted among patients with PUD visiting several community pharmacies in Jakarta, Indonesia. Patient satisfaction was measured by comparing patient perceptions before and after pharmacist counseling during the same visit period. The ServQual dimensions measured included reliability, assurance, tangibles, empathy, and responsiveness (RATER), based on the ServQual method. Counseling was provided by pharmacists who had received pharmaceutical counseling training in accordance with the researchers' established standards and had an adequate understanding of PUD and its management.

Research subjects and participant criteria

The subjects of this study were adult patients diagnosed with PUD who received a prescription and filled the medication at the study pharmacy. Inclusion criteria included patients who were willing to participate by signing an informed consent, were able to communicate effectively verbally and in writing, and fully participated in the pharmacist counseling process. Exclusion criteria included patients with incomplete questionnaire data or who did not participate in the entire study.

Research instrument

The research instrument used was a questionnaire developed by the researcher based on the ServQual framework and adapted to the context of pharmaceutical services in pharmacies. This questionnaire consisted of a total of 21 questions, including 6 questions regarding the respondents' sociodemographic characteristics and 15 patient satisfaction statements covering the five dimensions of ServQual, explicitly RATER, each consisting of 3 items. The content validity of the questionnaire was assessed using the individual content validity index (I-CVI) by experts, and all items obtained an I-CVI value of 1, indicating 100% content validity. The internal reliability test yielded a Cronbach's alpha of 0.976 ($p<0.01$) [27], indicating very high internal consistency; therefore, the questionnaire was deemed valid and reliable for measuring patient satisfaction. Responses were collected using a 5-point Likert scale. Mean item scores were converted into percentages by normalizing against the maximum possible score.

Sampling

A minimum sample size of 96.04 was calculated based on a marginal error of 5–10% and a prevalence of 50% using the following *Cochran's* formula [28].

$$n = \frac{z^2 pq}{e^2},\ n = \frac{1.96^2 0.5x0.5}{0.1^2} = 96.04$$

In this formula, *n* denotes the required sample size; z is the standard normal statistic (z=1.96 for 95% confidence); e is the sampling error (5–10%); p is the probability of a correct outcome (0.5); and *q* is the probability of an incorrect outcome (0.5). Patients were recruited using consecutive sampling of eligible individuals who visited the pharmacies during the study period. A preliminary study was first conducted on 20 volunteers. Pharmacies were selected using convenience sampling from a network of community pharmacies in Jakarta. This preliminary study is used for the validity and reliability of the questionnaire.

Ethical consideration

The protocol was approved by the Ethics Committee of Andalas University, Padang (Number: 55/UN.16.10.D.KEPK-FF/2024). Next, the questionnaire was validated using reliability and validity analyses in the Statistical Package for the Social Sciences (SPSS).

Pharmacist participation

This study involved six pharmacists who handled various respondents. Pharmacist participation varied across respondents. The counseling sessions were conducted by Pharmacist 1 (48.9%), followed by Pharmacist 2 (17.5%) and Pharmacist 3 (11.2%). Smaller proportions of respondents received counseling from Pharmacist 4 (9.1%), Pharmacist 5 (7.7%), and Pharmacist 6 (2.1%), whereas 3.5% received counseling from other pharmacists.

Structured pharmacist counseling intervention

The pharmacist counseling intervention was delivered using a structured and standardized protocol to ensure consistency across participating pharmacies. Counseling sessions included detailed explanations of medication indications, appropriate dosage, administration schedules, and treatment duration for PUD. Pharmacists also provided information on potential adverse effects, drug–drug and drug–food interactions, and practical strategies for managing or preventing side effects. In addition, patients received lifestyle and dietary counseling, including guidance on meal patterns, avoidance of gastric irritants, stress management, and smoking cessation where applicable. To standardize the intervention, all pharmacists followed a predefined counseling checklist that outlined key counseling components and ensured uniform delivery of information to all participants.

Statistical analysis

Item-level and dimension-level scores were calculated from questionnaire responses by computing the mean score for each item and aggregating items within each dimension. Before comparative analysis, data normality was assessed using the Shapiro–Wilk test. Because the data were not normally distributed, nonparametric statistical tests were used to compare pre- and post-counseling scores. Differences between paired observations were analyzed using the T-test. All statistical analyses were performed using Statistical Product and Service Solutions software. A $p<0.05$ was considered statistically significant [29].

RESULTS

Counseling was provided to 150 patients with PUD at 15 network pharmacies in Jakarta, Indonesia. Questionnaires were distributed before and after pharmacists' counseling sessions. A total of 148 patients completed the pre-counseling questionnaire and 143 completed the post-counseling questionnaire, resulting in a response rate of 95.33% (66.7% female, 34.3% male). Five participants did not complete the post-counseling questionnaire and were excluded from the final paired analysis. Most participants were adults (91.6%), whereas 8.4% were older adults. The majority lived in Jakarta. In terms of education, 58.7% were college graduates, 39.2% had completed high school, and 2.1% had completed junior high school. Regarding occupation, 37.1% were employees, 26.6% were students, 7% were self-employed, 24.5% reported other professions, and some were unemployed professionals. The socio-demographic characteristics of the respondents are presented in Table 1.

Patient satisfaction with pharmacist services was measured based on five ServQual dimensions: Tangibles, reliability, responsiveness, assurance, and empathy, which were evaluated before and after

Table 1: Demographic data of participants in the study (n=143)

Demographic variable	Frequency (n)	Respondent (%)
Gender		
Male	49	34.30
Female	94	65.70
Age (years)		
Adult (18–60)	131	91.60
Geriatric (>60)	12	8.40
Residence		
Jakarta	141	98.60
Outside Jakarta	2	1.40
Educational level		
Junior high school	3	2.10
High school	56	39.20
University graduate	84	58.70
Occupation		
Student	38	26.60
Freelance	6	4.20
Employee	53	37.10
Entrepreneur	11	7.70
Others	35	24.40

Freelance: Individuals who work without long-term employment ties. Entrepreneur: Individual who owns and manages a business. Others: Respondents who chose not to disclose or did not report their employment status in the questionnaire

pharmacist counseling. Differences in satisfaction levels are shown in Table 2. This table compares patient expectations and perceptions at both measurement points and reports a p-value indicating the significance of differences in patient satisfaction following the counseling intervention.

Based on Table 2, pharmacist counseling significantly improved patient expectations and perceptions across all ServQual dimensions. For the reliability dimension, patient expectations were 56.08% before counseling and increased to 85.81% following counseling. Meanwhile, patient perceptions of pharmacist service reliability rose from 73.65% before counseling to 93.92% after counseling. This improvement reflects the pharmacist's role in providing reliable drug information, clear explanations of dosage and administration, and education regarding potential side effects and their management, thereby increasing patient trust in pharmaceutical services. For the responsiveness dimension, patient expectations rose from 57.21% before counseling to 86.26% after counseling, while patient perceptions increased from 73.20% to 93.47%. This indicates that pharmacist counseling can improve patient perceptions of service responsiveness, as evidenced by sufficient service time, a friendly, enthusiastic demeanor during counseling, and a willingness to be contacted again if the patient requires further consultation. The assurance dimension also showed significant improvement. Patient expectations increased from 59.46% before counseling to 87.84% after counseling, while patient perceptions rose from 74.77% to 95.27%. These findings indicate that pharmacist counseling provides patients with a sense of security and confidence, both by ensuring medication quality and by offering alternative therapies when prescribed medications are unavailable. The most significant improvement was seen in the empathy dimension. Patient expectations of pharmacist empathy increased from 54.50% before counseling to 90.21% after counseling, while patient perceptions rose from 72.30% to 96.50%. This demonstrates that a patient-centered counseling approach enables pharmacists to understand patients' specific needs better, provide personalized, unhurried attention, and deliver counseling without discrimination.

Table 3 shows statistically significant improvements across all ServQual dimensions after pharmacist counseling ($p<0.05$). Post-counseling perception scores exceeded 95% in all dimensions, with the largest gains observed in Assurance and Empathy, highlighting the importance of pharmacist–patient communication in building trust and individualized care. Improvements in Reliability and Responsiveness reflect enhanced clarity of medication information and service availability, consistent with previous studies [30]. However, as this was a single-visit pre–post assessment, the durability of these improvements over time remains uncertain [31]. Longitudinal studies are needed to evaluate the sustainability of counseling-related satisfaction gains.

DISCUSSION

ServQual dimensions showed statistically significant improvements ($p<0.05$), confirming that pharmacist counseling positively affects patient satisfaction. One of the main strengths of this study's results is the consistent improvement across all ServQual dimensions, both in the technical aspects of service (reliability and assurance) and the interpersonal aspects (responsiveness and empathy). This emphasizes the role of pharmacists not only as medication providers but also as healthcare professionals contributing to the clinical and humanistic aspects of service. Furthermore, increased patient expectations following counseling indicate that pharmacist counseling can enhance patients' understanding of the pharmacist's professional role. Patients become more aware of the standard of care they should receive, which is a crucial step in fostering patient engagement and shared decision-making.

The high post-counseling perception scores, particularly on the assurance and empathy dimensions, indicate that the service met or exceeded patient expectations. This alignment between expectations and perceptions is an important indicator of patient satisfaction and can increase patient trust and loyalty in pharmacy services [32].

The results of this study indicate that pharmacist counseling significantly improves patient expectations and perceptions across all ServQual dimensions: Reliability, responsiveness, assurance, and empathy. These findings align with various international studies confirming that the quality of pharmacist counseling and communication is a key determinant of patient satisfaction with pharmaceutical services. Although the study results demonstrate a positive impact, several caveats warrant consideration. The heightened patient expectations following counseling could pose a challenge in the future, as they demand consistent ServQual. If counseling is not provided consistently or if pharmacists are constrained by time and resources, the mismatch between expectations and the service received can reduce patient satisfaction. Furthermore, patient satisfaction measures are subjective and may be influenced by social desirability bias, particularly because counseling is provided directly by pharmacists. Patients may tend to offer more positive ratings out of appreciation for the interpersonal interaction.

A study in Saudi Arabia reported that patients who received pharmacist counseling had significantly higher satisfaction than those who did not [33]. The study showed that counseling duration, the clarity of drug information, and the pharmacist's professional attitude significantly contributed to increased patient trust and satisfaction. These findings are consistent with this study's results, in which the reliability and assurance dimensions increased significantly after counseling, reflecting the pharmacist's role in providing accurate information and fostering patients' sense of security.

However, several international studies have reported conflicting results. A cross-sectional study in South Korea found that patient satisfaction with counseling services in community pharmacies remained moderate to low, particularly with respect to responsiveness [34]. Limited counseling time and pharmacist workload were cited as key factors that decreased patient satisfaction. Contrary to these findings, this study showed a significant increase in the responsiveness dimension after counseling, indicating that providing sufficient time and active communication can overcome frequently reported barriers to pharmacy practice in various countries [34,35].

Furthermore, systematic reviews and empirical studies have shown that interpersonal factors, such as empathy and personal attention

Table 2: Patient satisfaction with pharmacist services (n=143)

Dimension/item	Before counseling		After counseling		p-value
	Expectation (%)	Perception (%)	Expectation (%)	Perception (%)	
Tangibles					
The pharmacist's counseling room is comfortable and clean	48.65	64.19	62.24	90.91	0.000*
The tools used by pharmacists are easy to understand	48.65	68.24	88.11	95.80	0.000*
Pharmacists are easy to find in pharmacies	55.41	72.87	88.81	98.60	0.000*
Reliability					
Pharmacists provided reliable information	60.14	77.03	89.51	96.50	0.000*
Pharmacists provided advice on dosage and how to use medications	52.03	70.95	88.81	97.20	0.000*
Pharmacists provided advice on possible side effects and how to handle them	56.08	72.97	88.11	97.90	0.000*
Responsiveness					
Pharmacists provided sufficient time for service	55.41	70.95	89.51	97.90	0.000*
Pharmacists were friendly and enthusiastic during counseling	58.11	79.05	89.51	97.20	0.000*
Pharmacists offered availability for later consultation	58.11	69.59	88.81	95.10	0.000*
Assurance					
Patients felt safe and confident with pharmacist counseling	62.84	77.03	90.21	99.30	0.000*
Pharmacists provided high-quality medications according to patient needs	58.11	75.68	92.31	98.60	0.000*
Pharmacists provided alternatives if the required medication was not available	57.43	71.62	90.21	99.90	0.000*
Empathy					
Pharmacists understood patients' specific needs	48.65	68.24	88.81	97.90	0.000*
Pharmacists provided personalized and unhurried attention	57.43	75.00	91.61	97.90	0.000*
Pharmacists provided counseling without discrimination	57.43	71.62	90.21	96.50	0.000*

Data are presented as percentages of the maximum achievable score. p-values were derived from a paired samples T-test, comparing pre-counseling and post-counseling perception scores for each item. *Statistical significance was defined as $p<0.05$. Mean item scores were converted into percentages by normalizing against the maximum possible score

Table 3: Dimension-level expectation and perception scores before and after pharmacist counseling (composite scores)

Dimension	Before counseling		After counseling		p-value*
	Expectation (%)	Perception (%)	Expectation (%)	Perception (%)	
Tangibles	50.90	68.43	79.72	95.10	0.000*
Reliability	56.08	73.65	88.81	97.20	0.000*
Responsiveness	57.21	73.20	89.28	96.73	0.000*
Assurance	59.46	74.78	90.91	99.27	0.000*
Empathy	54.50	71.62	90.21	97.43	0.000*

Composite dimension scores were calculated by averaging the percentage scores of the three items within each ServQuaL dimension for expectation and perception. Mean item scores were converted into percentages by normalizing against the maximum possible Likert-scale score. p-values were obtained using a Dependent t-test comparing pre- and post-counseling perception scores. *Significant level: $p<0.05$

from pharmacists, significantly affect patient satisfaction [36]. The internationally developed and validated patient satisfaction with pharmacist services questionnaire places empathy, professionalism, and pharmacist involvement as key components of patient satisfaction [37-39]. This aligns with the study's results, in which the empathy dimension showed the greatest increase following counseling, underscoring the importance of a patient-centered care approach.

Despite these encouraging results, limitations remain. Not all patients benefit equally from counseling (approximately 10–20%) show no improvement in specific domains, suggesting that barriers such as health literacy, patient motivation, or the depth of counseling provided may influence outcomes [6,40]. Furthermore, although counseling effectively improves patient satisfaction with pharmacist care in the short term, the long-term sustainability of these changes remains uncertain and requires further evaluation. There is also ongoing debate about the feasibility of implementing structured counseling in busy community pharmacy settings, where high workloads and limited integration with other healthcare providers may hinder consistency. Pharmacist counseling offers clear benefits in improving patient knowledge, attitudes, and practices regarding PUD. However, further research is needed to optimize delivery methods, ensure long-term behavioral change, and address systemic barriers to pharmacist-led education in community settings.

Strengths and limitations

This study is the first in Indonesia to evaluate the impact of structured pharmacist counseling on patient satisfaction with pharmacist services among patients with peptic ulcer, providing important evidence-based and a practical counseling model for community pharmacies. However, limitations include the use of a convenience sample (non-probability sampling) of 15 pharmacies in Jakarta, which limits generalizability and results in a limited sample size. Only a small proportion of pharmacists actively provides counseling, often with support from pharmacy students.

CONCLUSION

This study shows that structured pharmacist counseling significantly improves patient satisfaction with peptic ulcers. Improvements were observed in the comfort of the counseling room, use of assistive devices, pharmacist presence in the pharmacy, reliability of drug information, dosage, and side effects, availability of pharmacist time, availability of pharmacist time, pharmacist willingness to attend subsequent consultations, patient confidence in the pharmacist, confidence in the prescribed medication, pharmacist solutions for unavailable medications, pharmacist understanding of the patient's condition, personalized service, and pharmacists providing services regardless of patient background. These findings emphasize the important role

of community pharmacists in patient education and self-management of PUD. However, given the single-visit pre-test/post-test design and the absence of long-term follow-up, the sustainability of these improvements cannot be determined. The findings should therefore be interpreted as exploratory. Future studies employing longitudinal designs are warranted to assess the durability of satisfaction gains and to evaluate the long-term impact of pharmacist counseling on patient-centered outcomes.

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DECLARATION OF GENERATIVE AI IN SCIENTIFIC WRITING

In preparing this manuscript, the authors used Grammarly Premium to improve grammar, readability, and language flow. These tools were applied with full human oversight, and all intellectual content, interpretation of results, and conclusions were entirely the authors' responsibility. In line with ethical guidelines, AI tools are not listed as authors or co-authors. The authors remain fully accountable for the integrity and accuracy of the manuscript.

AUTHOR CONTRIBUTION

Hendra Farma Johar contributed to the investigation, data curation, and preparation of the data, as well as to the original draft. Hansen Nasif was responsible for formal analysis, validation, and visualization and contributed to reviewing the manuscript. Yufri Aldi provided resources, supervision, and project administration. Najmiatul Fitria led the conceptualization and methodology, supervised the research, secured funding, and contributed to the manuscript review and editing. All authors have read and approved the final version of the manuscript.

CONFLICT OF INTEREST

The author (s) declare no conflict of interest.

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