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Original Research Article

Assessment of knowledge, attitude and practice of pharmacoeconomics among healthcare professionals in a tertiary care teaching hospital

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ABSTRACT

Background: Escalating healthcare costs in developing countries necessitates rational resource allocation pharmacoeconomic evaluations analyse costs and outcomes of drug therapy and related services to support evidence-based formulary, pricing, and policy decisions. Limited Indian data exist on healthcare professionals' understanding and practical use of pharmacoeconomics. This study therefore aimed to assess the knowledge, attitude, and practices regarding pharmacoeconomics among healthcare professionals in a tertiary care teaching hospital.
Methods: A cross-sectional, questionnaire-based study was conducted in a tertiary care teaching hospital after ethics committee approval. A pre-validated online questionnaire assessed knowledge of pharmacoeconomic concepts, attitudes toward cost considerations, and practices in clinical decision-making. Data were analysed using descriptive statistics.
Results: A total of 206 participants were included in the study. Overall, 74.8% correctly defined Pharmacoeconomics, 64.1% had encountered the term in practice, and 48.5% correctly identified monetary units as outcome measures in cost-benefit analysis. The majority considered cost as an important factor in patient care (87.4%), supported inclusion of pharmacoeconomics in the curriculum (91.3%), and agreed that pharmacoeconomic studies influence prescribing (79.6%). In practice, 61.7% regularly discussed costs with patients, 64.1% frequently considered costs in clinical decisions, and 76.2% had changed prescriptions due to cost. Limited knowledge and training emerged as prominent barriers (19.9%).
Conclusions: Healthcare professionals exhibited good theoretical knowledge and positive attitudes toward pharmacoeconomics, but gaps persist in practical application. Integrating pharmacoeconomic principles into medical curricula and implementing structured training programs are essential to bridge this knowledge–practice gap.

Keywords: Pharmacoeconomics, Knowledge, Cost-benefit analysis, Cost-effectiveness analysis

INTRODUCTION

Rising healthcare costs and limited resources in the developing countries like India make it crucial to justify the healthcare spending and evaluate both the economic and humanistic outcomes of the drug therapies. Pharmacoeconomics plays a key role in linking clinical effectiveness with cost-efficiency to ensure optimal patient care.[1,2] The International Society for Pharmacoeconomics and Outcomes Research (ISPOR) defines Pharmacoeconomics as "the field of study that evaluates the behaviour of individuals, firms, and markets relevant to the use of pharmaceutical products, services, and programs, and which frequently focuses on the costs (inputs) and consequences (outcomes) of that use."[2] Pharmacoeconomics comprises a range of analytical approaches, which includes Cost-benefit analysis (CBA), where both costs and benefits are translated into monetary

values to identify the most efficient option. Cost-minimization analysis (CMA) compares the expenses of treatments proven equal in effectiveness to select the least costly alternative. Cost-utility analysis (CUA) evaluates costs in relation to quality-adjusted life years (QALY) gained. Cost-effectiveness analysis (CEA) assesses both expenditures and health outcomes, reporting results as cost per achieved outcome such as cost per blood pressure reduction.[3]

Pharmacoeconomics optimizes healthcare resource use by balancing treatment benefits with costs, easing financial burdens and supporting informed clinical and policy decisions.[4] In India, limited training and awareness among physicians hinder the adoption of cost-effective prescribing practices. Assessing clinicians' knowledge, attitude, and practices is therefore essential to identify gaps and inform targeted educational and policy interventions.[5,6] Thus, this study seeks to systematically evaluate these domains among healthcare professionals in a tertiary care teaching hospital in Central India.

METHODS

Study design

A cross-sectional, questionnaire-based study was conducted over 2 months (May to July 2025) after obtaining approval from the Institutional Ethics Committee (Approval No.: EC/Pharmac/GMC/NGP 3696, dated 29 April 2025).

Study population

The study included 206 healthcare professionals comprising medical and dental interns, postgraduate residents, and faculty members, willing to participate in the study. Eligible participants were informed about the objectives of the study. Participation was voluntary, and confidentiality of responses was assured. They commenced the survey only after providing informed consent. Participants who declined consent and incomplete or partially filled questionnaires were excluded.

Data collection instrument

A structured, pre-tested and pre-validated self-administered questionnaire was developed after reviewing previously published KAP studies assessing awareness and application of Pharmacoeconomics.[8-12] The questionnaire was pilot evaluated among subject experts and modified based on their feedback prior to finalization. It was administered in both offline format as well as an online Google form. The questionnaire was structured into 2 distinct sections. Section one collected respondents' demographic details, including name, age, gender, designation, and years of clinical experience. Section two comprised items assessing participants' knowledge, attitudes, and practices related to pharmacoeconomic. Participants responded to the questions by selecting from a five-point Likert scale ranging from "strongly agree" to "strongly disagree."

Data analysis

Data from 206 respondents were tabulated into Microsoft Excel and analysed using descriptive statistics. Continuous variables were expressed as mean ± standard deviation, while categorical variables were summarized as frequencies and percentages. Knowledge scores were calculated based on correct responses to objective questions. Attitude scores were categorized as positive (strongly agree/agree) or negative (disagree/strongly disagree). Practice patterns were analysed using response categories of "always, often, sometimes, rarely and never".

RESULTS

A total of 206 participants were included in the study. The mean age of the participants was 29.4±3.2 years. Gender distribution was nearly equal, with 104 females (50.5%) and 102 males (49.5%). The majority of participants were medical postgraduate residents (95.6%), while 2.4% were dental professionals and 1.9% were faculty members. The distribution of participants according to clinical experience is presented in Table 1.

Table 1: Years of clinical experience of participants (n=206).

Sr. no.	Clinical experience in years	No. of participants (%)
1.	<1 year	25 (12.1)
2.	1-3 years	121 (58.7)
3.	3-5 years	36 (17.5)
4.	> 5 years	24 (11.7)

A substantial proportion of participants (74.8%) correctly identified Pharmacoeconomics as the "study of the economic impact of drug therapy on healthcare systems and society". However, 15.0% incorrectly perceived it as pharmaceutical company financial management, 7.3% confused it with drug–biological system interactions producing therapeutic effects, and 2.9% associated it with healthcare policy evaluation. Awareness of pharmacoeconomic evaluation methods varied among participants. Familiarity was highest for cost-effectiveness analysis (71.8%) and cost-benefit analysis (65.5%), while awareness of cost-utility analysis (25.2%) and cost-minimization analysis (28.6%) was considerably lower. Overall, 15.5% of participants reported no familiarity with any pharmacoeconomic method, whereas 13.6% reported comprehensive familiarity with all four methods. Participants' understanding of cost-benefit analysis is summarized in Table 2. Regarding the primary objective of cost-minimization analysis, the majority (63.6%) correctly identified it as "selecting the least expensive option among equally effective alternatives". Knowledge assessment of participants is presented in Table 3 and awareness of participants regarding pharmacoeconomic is

Table 2 Participants' understanding of cost–benefit analysis (n=206) presented in Table 4. Self-reported confidence in interpreting pharmacoeconomic data varied among participants. 43.7% reported moderate confidence, 27.7% reported high confidence, 5.3% reported very high confidence, while 23.3% reported low confidence.

Table 2: Participants' understanding of cost–benefit analysis (n=206).

Q.	In cost-benefit analysis, outcomes are measured in?	
	Options	**Response (%)**
1.	Clinical measures (e.g. BP reduction in mmhg)	20 (9.7)
2.	Quality adjusted life years (QALYS)	51 (24.8)
3.	Monetary units (e.g. Rupees)	100 (48.5)
4.	Patient satisfaction and quality of care	35 (17)

Table 3: Knowledge assessment of participants (n=206).

Sr. no.	Questions	Correct response (%)	Incorrect response (%)
1.	What is pharmacoeconomics?	154 (74.8)	52 (25.2)
2.	In cost-benefit analysis, outcomes are measured in?	100 (48.5)	106 (51.5)
3.	What is the primary goal of cost-minimization analysis (CMA)	131 (63.6)	75 (36.4)

Table 4: Awareness of participants regarding pharmacoeconomics (n=206).

Sr. no.	Questions	Yes (%)	No (%)
1.	Have you come across the term pharmacoeconomics in your day-to-day clinical practice?	132 (64.1)	74 (35.9)
2.	Are you familiar with any of the following economic evaluation methods?	175 (85.0)	31 (15)
3.	Do you think pharmacoeconomic evaluation is practiced in the hospital where you work?	141 (68.4)	65 (31.6)

Table 5: Attitude of participants towards pharmacoeconomics (n=206).

Sr. no.	Question	Positive Response* (%)
1.	How important is it to consider cost while making decisions about patient care?	180 (87.4)
2.	How confident are you in your ability to interpret and apply pharmacoeconomic data in your practice?	158 (76.7)
3.	How do you perceive the role of generic medicines in improving patient compliance?	163 (79.1)
4.	The results of pharmacoeconomic studies influence drug prescribing practices	164 (79.6)
5.	Pharmacoeconomic evaluations can help improve the efficiency of healthcare resource allocation	175 (85.0)
6.	Pharmacoeconomic principles should be integrated into the medical undergraduate curriculum	188 (91.3)

* Positive response – 1. "Extremely or very important", 2. "Extremely, very, or moderately confident", 3. "Very or somewhat effective", 4-6. "Agree or strongly agree."

Attitudes toward generic medicines were generally positive. 29.6% of participants perceived generic medicines as very effective in improving patient compliance, and 49.5% considered them somewhat effective. Only 3.9% perceived generic medicines as ineffective. Attitude assessment of the participants is presented in Table 5.

Cost consideration in clinical decision-making showed moderate engagement, with 22.8% always considering costs and outcomes, 41.3% often doing so, 27.2% sometimes, and 8.3% rarely incorporating economic factors. Cost-Effectiveness Analysis emerged as the most commonly used approach (43.2%), followed by CBA (28.6%). Notably, 20.9% of participants reported applying cost considerations without awareness of specific analytical methods. Awareness regarding the Jan Aushadhi Kendra scheme was variable. While 38.3% were fully aware of the program and its objectives, 41.3% had heard of the scheme but lacked detailed knowledge, and 20.4% were completely unaware. Practice patterns related to patient communication revealed that 19.4% of participants always discussed treatment costs with patients, 42.2% often did so, 29.6% sometimes discussed costs, and 8.7% rarely engaged in such discussions. Practice assessment findings are summarized in Table 6.

Table 6: Responses of participants regarding practical use of pharmacoeconomics (n=206).

S.N.	Questions	Positive Response* (%)
1.	Have you ever discussed the cost of different treatment options with your patients?	127 (61.7)
2.	How frequently do you consider the costs and benefits of treatments while making decisions in your clinical practice?	132 (64.1)
3.	Have you ever changed a patient's prescription due to cost considerations?	157 (76.2)
4.	Which pharmacoeconomic analysis is most commonly used in your clinical practice?	Cost-effectiveness analysis-89 (43.2)
5.	Are you aware of jan aushadhi kendra established under the pradhan mantri bhartiya janaushadhi pariyojana (PMBJP) scheme?	164 (79.6)

* Positive response – 1,2. "Always or often" 3. "Yes", 4. "Cost-effectiveness analysis", 5. "Yes, I am fully aware of them and their purpose or Yes, I have heard about them but do not know the details."

Table 7: Analysis of knowledge, cost consideration, and cost discussion according to years of clinical experience (n=206).

Sr. no.	Years of experience	No. of participants	No. of participant with correct Definition of pharmacoeconomics (%)	Cost consideration in clinical decision-making* (%)	Cost discussion with patients[1](%)
1.	<1 year	25	21 (84.0)	16 (64.0)	14 (56.0)
2.	1–3 years	121	88 (72.7)	75 (62.0)	71 (58.7)
3.	3–5 years	36	27 (75.0)	25 (69.4)	22 (61.1)
4.	>5 years	24	18 (75.0)	16 (66.7)	20 (83.3)

*Cost consideration = "Always" or "Often" considering costs and outcomes in clinical decision-making[1]Cost discussion = "Always" or "Often" discussing treatment costs with patients.

Barrier analysis revealed multiple challenges to the application of pharmacoeconomics in clinical practice. "Limited knowledge and training" were identified as the most prominent single barrier (19.9%). When combinations of barriers were considered, the most frequently reported combination was lack of time and resources, limited knowledge and training, patient preferences and expectations, and lack of supportive policies (15.5%). Analysis stratified by clinical experience demonstrated that theoretical knowledge of pharmacoeconomics remained approximately 73–84% across all experience groups. The experience-wise distribution of knowledge, cost consideration, and patient communication practices is presented in Table 7.

DISCUSSION

India continues to face major healthcare challenges related to affordability and access to essential care. Pharmacoeconomics provides an important framework for the efficient use of limited healthcare resources. In the present study, nearly three-quarters of healthcare professionals accurately identified pharmacoeconomics as "the study of the economic impact of drug therapy on healthcare systems and society." This represents a substantial improvement compared to earlier Indian study by Jayasree et al, where correct understanding was reported in only about 30% of participants. This improvement highlights enhanced emphasis in the recent medical curricula. Nevertheless, the persistence of certain misconceptions indicates that conceptual clarity remains incomplete.[6,7,9,15] The overall awareness levels observed in this study (64.1%) are comparable to findings reported by Reshma et al, who documented pharmacoeconomics awareness in approximately 70% of participants. Despite high recognition, actual application in routine clinical practice remains limited, showing a gap between theoretical knowledge practical implementation.[7] Participants demonstrated better understanding of CEA and CBA than cost-utility analysis (CUA) and cost-minimization analysis (CMA). This pattern is consistent with findings from a recent study conducted by Alsahali et al in Saudi Arabia, where familiarity with CEA and CBA exceeded that of other methods. This underscores the need for targeted training focused on all the clinically important evaluation techniques.[8,10,15]

Nearly half of the participants correctly identified monetary units as the outcome measure in CBA, indicating an improvement over earlier reports. However, incomplete understanding among a significant proportion of respondents suggests ongoing educational gaps.[9] Similarly, only a moderate proportion correctly identified the primary objective of CMA, in contrast to the more comprehensive understanding reported among pharmacy professionals in the United States (by Makhinova and Rascati).[10] This highlights the need for structured and standardized Pharmacoeconomics curricula in Indian postgraduate medical training to enhance knowledge and optimize resource use. This study indicates moderate institutional integration of pharmacoeconomic evaluation into clinical decision-making, exceeding earlier study finding by Tahashildar et al that documented very limited awareness and utilization. The findings reinforce the need

for strengthened training, supportive policy frameworks, and institutional infrastructure to embed Pharmacoeconomics in Indian medical practice.[11]

Attitudes toward pharmacoeconomics were largely positive, with most participants supporting its role in optimizing healthcare resource allocation. This exceeds the findings of positive attitudes in a study conducted by Alshayban in Saudi Arabia. It suggests strong acceptance of pharmacoeconomic principles despite limited formal training, and readiness for implementation.[12,13,14,16] This study aligns with the findings from a Middle Eastern study by Alzarea et al, showing strong support for Pharmacoeconomics despite barriers like limited data access and training. This highlights the widespread recognition of its value, but urgent need for improved education and infrastructure to enable effective clinical implementation.[13]

Both this study and a study by Hemyari et al in the UAE show a strong consensus among healthcare professionals on the importance of pharmacoeconomic evaluation for guiding clinical decisions. This reflects a growing recognition of cost-effectiveness in healthcare, consistent with regional trends.[14] Nearly half of the postgraduate residents in this study correctly identified monetary units as the outcome measure in CBA, showing notable improvement as compared to previous studies. However, this highlights ongoing knowledge gaps and the need for more targeted training in economic evaluation within medical education.[15] This study shows strong support for integrating pharmacoeconomics into the undergraduate curriculum, exceeding earlier findings in a study by Gupta and Malhotra. This growing awareness highlights the urgent need to embed pharmacoeconomics training at both undergraduate and postgraduate levels to prepare healthcare professionals for cost-effective clinical practice.[16] Studies in India and Saudi Arabia show that most healthcare professionals accept generic medicines as effective and useful for improving adherence by reducing costs, though concerns about quality and efficacy persist among a minority. Strengthening pharmacovigilance, regulatory assurance, and awareness programs could further boost trust and wider adoption of generics.[13,16,19,20] A minority of healthcare professionals in this study consistently include costs and benefits in clinical decisions, while few rarely consider costs. Both this study and a study by Rajkumar et al reveal that despite growing awareness of drug cost burdens, barriers like education and information gaps limit practical application. Enhancing training, accessible drug pricing data, and cost-conscious policies are key to fostering cost-effective care.[17,21,22]

This study supports the study conducted by Jamison et al. in acknowledging CEA as crucial for global health prioritization. Jamison noted widespread informal cost use, while our findings highlight increasing formal adoption but persistent gaps, stressing the need for better education and institutional support.[18] Awareness of the Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP) scheme was moderate in this study, comparable to a recent study conducted by Chaturvedi et al. However, a notable proportion of participants remained completely unaware of the scheme, consistent with earlier reports by Sareen A et al.[19,20] Limited awareness among prescribers may contribute to underutilization of cost-effective generic medicines despite their availability. This study aligns with Shih et al in showing that while a considerable share of patients wants cost discussions, only a minority of healthcare providers routinely engage in them, often hindered by limited cost information and time constraints. Enhancing provider training can improve communication and patient satisfaction.[21,22] Over three-quarters of healthcare professionals in this study modified prescriptions due to cost, consistent with a study by Lussier et al and Rajkumar. Clinicians frequently adjust treatments to improve affordability and adherence, but lack of clear cost data hinders these efforts. Improved access to transparent drug pricing information and support tools are vital to aid cost-effective prescribing.[17,22,21] Consistent with a prior study conducted by Ibrahim et al, major barriers to pharmacoeconomic implementation included limited knowledge and training, lack of supportive policies, time constraints, and patient-related factors.[11-23] Overcoming these requires improved education, supportive policies, better data systems, and inclusive decision-making.

Experience-wise analysis in the present study demonstrated a clear gap between theoretical knowledge and practical application of pharmacoeconomics. Healthcare professionals with less than 1 year of clinical experience exhibited stronger conceptual understanding but limited integration of cost considerations into routine prescribing and patient communication. In contrast, practitioners with greater clinical experience showed more consistent incorporation of cost-conscious decision-making, particularly in discussing treatment expenses with patients. Similar experience-dependent trends have been reported in previous KAP studies, where early-career clinicians demonstrated higher theoretical awareness but limited real-world application, whereas experienced practitioners showed stronger cost-conscious practices.[6,7,15,22,23] These findings highlight a persistent knowledge–practice gap and emphasize the need for practice-oriented pharmacoeconomic training through educational reinforcement, and continuing professional development to ensure consistent application in routine clinical decision-making.

Limitations

Knowledge, attitude, and practice assessments relied on self-reported information, which may be subject to response bias.

CONCLUSION

Healthcare professionals in this study demonstrated good theoretical knowledge and positive attitudes toward Pharmacoeconomics, with widespread recognition of the

importance of cost considerations in clinical decision-making. Many healthcare professionals reported considering treatment costs in their prescribing decisions despite limited awareness of formal pharmacoeconomic methods, indicating a willingness to adopt cost-conscious patient care. However, awareness and consistent application of pharmacoeconomic principles in routine clinical practice remained suboptimal, indicating a clear knowledge–practice gap.

Since the healthcare professionals in the present study represent future clinical decision-makers, there is a strong need to integrate pharmacoeconomics into undergraduate and postgraduate curricula through structured education and training. Supportive institutional policies and expanded pharmacoeconomic research across diverse healthcare settings are essential to strengthen awareness and promote cost-effective patient care nationwide.

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