Cross-Sectional Study

# Simulated Patient Study in Community Pharmacy Regarding Patient Counseling and Dispensing of Insulin Pen

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## Abstract

Insulin therapy is vital for diabetic patients, but errors in its administration can be life-threatening. Pharmacists play a key role in educating and counseling patients on proper insulin pen use. This study investigates the awareness of community pharmacists regarding insulin pen usage using a simulated patient approach. A cross-sectional study employed the simulated patient method, using a scenario with a prescription for a regular insulin pen. The focus was on evaluating pharmacists' counseling and education roles, comparing their information with expert recommendations for optimal insulin injection techniques. The study revealed moderate performance among community pharmacists in insulin pen counseling and dispensing. Some pharmacists merely dispensed insulin and referred patients to physicians for guidance. While a high percentage demonstrated proper procedures like insulin collection, handwashing, cap removal, and insulin examination, comprehensive patient counseling was often lacking. The simulated patient study highlights the need for standardized training and ongoing education for community pharmacists in insulin pen counseling and dispensing. Many pharmacists lack the expertise to provide diabetic patients with adequate guidance, underscoring the importance of practical demonstrations and addressing geographical variations in practices.

**Keywords:** Simulated study, Dispensing, Patient counselling, Insulin pen fill, Pakistan

## Introduction

Diabetes stands as a widespread health concern on a global scale, presenting one of the most significant challenges in 21st-century healthcare. In Pakistan, the prevalence of diabetes is notably high, affecting approximately 26.7% of adults, which translates to roughly 33 million cases. Consequently, Pakistan has emerged as one of the countries that are most susceptible to diabetes-related fatalities on a global scale [1].

Diabetes Mellitus represents a prevalent metabolic disorder. Errors related to insulin medication administration pose significant risks to patient lives, often arising during insulin preparation and administration. Pharmacists hold a crucial responsibility in educating and counseling diabetic patients, thus reducing the occurrence of errors in insulin utilization. Many studies reported that diabetic patients have poor knowledge and practice in administering insulin [2].

Many patients may find insulin pens to be a convenient option for administering insulin, especially when compared to using a vial and syringe. For those who may have doubts about insulin therapy, insulin pens can offer a simpler and more user-friendly alternative. Learning the proper injection technique gives patients the confidence to overcome their fears of injections and effectively manage their blood sugar levels. The concept of pharmaceutical care focuses on the careful administration of medication to achieve desired outcomes and improve patients' overall well-being. In addition to providing patients and the public with pharmacological information, their professional activities also involve coaching patients during the prescription and over-the-counter medicine distribution process [3]. In order to enhance the chances of successful treatment outcomes, it

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is important to assess whether patients comprehend and effectively utilize the provided information. Counseling aimed at promoting responsible and safe pharmaceutical use serves the ultimate goal of improving therapeutic results [4].

Our study is unique in that it pioneers an investigation into the awareness levels of community pharmacies regarding the usage of insulin pens in Pakistan, a venture not previously undertaken. This gap in research exists due to the limited attention given to the role of community pharmacies in promoting safe insulin pen usage [5]. Recognizing the critical importance of ensuring patient safety and effective treatment outcomes, we embark on this study to address potential inconsistencies and deficiencies in knowledge and support provided by community pharmacies [6]. Looking ahead, the insights garnered from our research can inform strategies to enhance patient education and support regarding insulin pen usage, ultimately improving diabetes management in Pakistan. With a focus on the scope of community pharmacy practices and the prevalence of diabetes-related issues in Pakistan, our study aims to shed light on critical areas for intervention and improvement in healthcare delivery [7].

However, it's essential to acknowledge the limitations and scope of this study. The findings may not be universally applicable to all community pharmacies, as the research primarily focuses on a limited number of them [8]. Additionally, while the simulated patient method is valuable, it may not perfectly replicate real-world interactions. Thus, it is crucial to evaluate whether patients grasp the information provided and if it is received as intended, to improve the likelihood of effective therapy results [8].

### *Objective*

The study aims to enhance community pharmacists' competency in counseling and dispensing insulin pens through simulated patient assessments, intending to improve patient care and identify areas for targeted training and interventions [9].

## Materials and Methods

Managing diabetes mellitus through insulin therapy is a critical aspect of healthcare. Community pharmacies play a significant role in supporting diabetic patients in their self-management practices [10]. There is limited research assessing the quality of patient counseling and dispensing regarding insulin pens so the effectiveness of insulin pen dispensing and patient counseling in community pharmacies requires proper evaluation. The utilization of simulated patients allows for a controlled and realistic environment to evaluate pharmacist-patient interactions [11].

### *Study Design*

A cross-sectional observational approach coupled with a simulated patient methodology is employed for this study. This combined methodology aims to comprehensively evaluate the proficiency of community pharmacists in patient counseling and the dispensing of insulin pens within a specific moment. The cross-sectional observational component aims to capture a momentary view of the communication skills, product knowledge, and patient-centered approaches employed by community pharmacists [12]. The main focus is evaluating current practices related to insulin pen dispensing and counseling across diverse community pharmacy settings. This cross-sectional approach enables a broad examination of prevalent practices without the need for prolonged data collection periods, providing valuable insights for targeted interventions and improvements in patient care within community pharmacy settings [13].

The simulated patient methodology introduces a controlled and standardized element to the study, allowing for the systematic evaluation of prevalent practices regarding insulin pen dispensing and counseling in community pharmacy settings. This approach provides a unique perspective by simulating real-world scenarios, enabling detailed analysis of how pharmacists respond to specific patient inquiries related to insulin pen usage. The simulated patient methodology enhances the validity and reliability of the study, offering valuable insights into the quality of patient counseling and insulin pen dispensing practices across diverse community pharmacy settings [10].

### *Inclusion Criteria*

Any registered community pharmacy in Lahore was included.

### *Exclusion Criteria*

Any pharmacy where the pharmacist was absent on two consecutive visits was excluded from the study. If the pharmacist detected the simulated patient visit, the pharmacy was excluded from the study.

### *Scenario*

To assess the community pharmacists' performance regarding insulin pen dispensing and counseling, a comprehensive scenario was made and rehearsed multiple times. An insulin pen was bought to be used by the simulated patients.

### *Background*

The study is set in a diverse urban area with several community pharmacies. The pharmacies vary in size, from independent local establishments to larger chain pharmacies. The study aims to assess the community pharmacists in insulin pen dispensing and patient counseling.

### *Situation*

A simulated patient walks into a randomly selected community pharmacy holding the insulin pen, seeking information and guidance on how to use that insulin pen. He approaches the pharmacy counter and asks the pharmacist about the proper usage of the insulin pen, including storage, administration, and potential side effects.

This scenario aims to determine how community pharmacists handle patient inquiries related to insulin pen usage in a common and real-life situation. By using this simulated patient approach across diverse community pharmacies, the study seeks to examine the consistency and effectiveness of patient counseling practices regarding insulin pen usage [14]. The session lasted for approximately 10 minutes. Pharmacies were scored using a 15-point checklist (where marked assume value set at 8) for skill and communication by either "Yes" or "No".

### Ethics Approval

Adhering to the ethical standards outlined by the National Bioethics Committee Pakistan, formal consent was considered unnecessary for this study. The study design and procedures were crafted to uphold ethical principles and standards. The decision to waive formal consent aligns with the nature of the research, ensuring participant confidentiality and privacy. The study's ethical framework prioritizes respect for individuals, while all procedures are conducted by the highest ethical standards. The National Bioethics Committee's guidelines were rigorously followed to guarantee the ethical integrity of the research and uphold the welfare of all involved parties [15].

### Sample Size and Sampling

The sample size was determined using **Rao soft software**. The sample size n and margin of error E are given by

$$x=Z(c/100)2r\ (100-r) \quad (1)$$

$$n=N\ x/\ ((N-1)\ E2 + x) \quad (2)$$

$$E=\sqrt{}\ [(N - n)\ x/n\ (N-1)] \quad (3)$$

Where N is the population size, r is the fraction of responses that were expected, and Z(c/100) is the critical value for the confidence level c.

The registered retail pharmacies in Lahore are N=3000, 5.2% of Lahore's 11.3 million population uses insulin pens, using the Rao software with an error margin of 5% and confidence level of 95% the necessary sample size was determined, which was n=384. 175 pharmacies were visited and 123 were included in the study with 53 having no pharmacist available on consecutive two visits [16].

A cluster sampling approach was employed to ensure a comprehensive evaluation of prevalent practices regarding insulin pen dispensing and patient counseling across different community pharmacy settings. Clusters refer to distinct community pharmacies selected as entire units rather than individually sampling pharmacy professionals. This method was chosen to account for potential variations within each pharmacy and to capture the diversity that exists across different establishments. By randomly selecting clusters of pharmacies, the study aimed to enhance the external validity of its findings, providing a more accurate reflection of the broader population of community pharmacies. This cluster sampling strategy determines that patient counseling and dispensing practices regarding insulin pens may differ or align within and across various community pharmacy environments, ultimately contributing to a more robust and applicable assessment [17].

### Data Collection

To capture and assess the intricacies of patient counseling and insulin pen dispensing practices across diverse community pharmacies, a data collection form was developed. This form incorporated a comprehensive 15-point checklist, carefully designed to encapsulate key aspects of patient counseling and insulin pen dispensing. Each of the 15 points represented crucial elements such as communication effectiveness, product knowledge, and patient-centered approaches [18]. During the study, participating pharmacies underwent evaluation based on this detailed checklist, with scores assigned to each of the 15 checklist items. This approach not only standardized the data collection process but also ensured a thorough analysis of community pharmacy practices, offering a detailed insight into the quality and uniformity of patient counseling and insulin pen dispensing practices across the sampled pharmacies. Five final-year Pharm-D students, comprising three females and two males, actively participated as simulated patients. To ensure proficient execution of their roles, extensive rehearsals were conducted which emphasized the use of lay language and avoidance of technical jargon. The assigned number of pharmacies was evenly distributed among the five students, and each student enacted the same scenario in every pharmacy visited. After each pharmacy visit, the simulated patients promptly filled out that 15-point data collection form. The final stage of data collection involved employing a coding system to facilitate analysis using SPSS, thereby enabling an in-depth evaluation of the quality of services provided by the pharmacies [19].

### Statistical Analysis

SPSS analysis was employed to investigate insulin pen counseling and dispensing practices among community pharmacists. The null hypothesis, assuming a mean effectiveness of 8, was examined using inferential statistics. The results, with a mean score of 2.74±0.02 and a p-value exceeding 0.05, revealed no significant difference in pharmacist performance. The data, organized using SPSS, is presented in tables, notably in **Table 1**, offering a concise overview of adherence to specific practices. Overall, SPSS facilitated a thorough analysis, providing valuable insights into the effectiveness of insulin pen counseling and dispensing practices in community pharmacies [20].

## Results and Discussion

**Table 1** and **Figure 1** provide a breakdown of responses for each question, offering insights into the pharmacists' adherence to specific insulin pen counseling and dispensing practices.

**Table 1.** Percentage of Pharmacists Adhering to Specific Insulin Pen Counseling and Dispensing Practices

| | Questions | Yes | No |
|---|---|---|---|
| 1 | Insulin Collection and Hand wash | 93.4% | 6.6% |
| 2 | Cap Removal and Insulin Examination | 73.8% | 26.2% |
| 3 | Rubber Cleansing with Alcohol Wipe | 45.1% | 54.9% |
| 4 | Needle Attachment | 91.8% | 8.2% |
| 5 | How to Prime the Pen | 92.6% | 7.4% |
| 6 | Dose Dialing | 96.7% | 3.3% |
| 7 | Injection Site Identification | 68.0% | 32.0% |
| 8 | Dose Delivery | 93.4% | 6.6% |
| 9 | Needle Disposal | 68.9% | 31.1% |
| 10 | Storage Conditions for Open Insulin Pen | 47.5% | 52.5% |

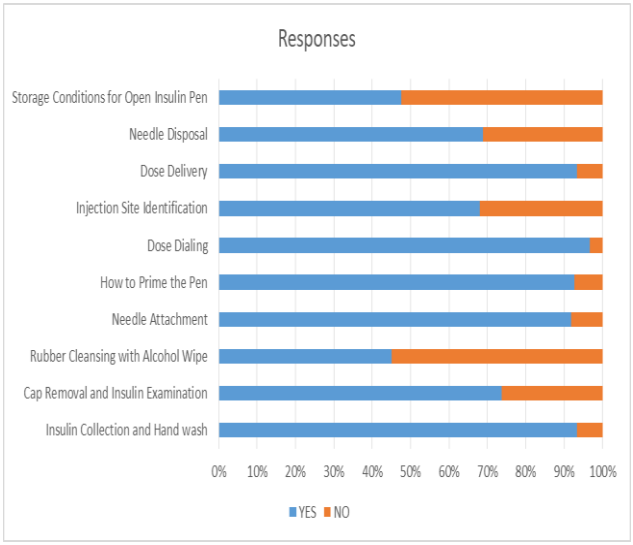


**Figure 1.** Graphical breakdown of responses for each question, offering insights into the pharmacists' adherence to specific insulin pen counseling and dispensing practices.

These frequencies reflect the percentage of pharmacists who correctly adhered to each specific practice. For instance, a high percentage of pharmacists demonstrated proper procedures for insulin collection, handwashing, cap removal, and insulin examination. On the other hand, practices such as rubber cleansing with alcohol wipes and storage conditions for open insulin pens showed a lower adherence rate.

The total score of the 15-point checklist indicates an overall moderate performance by community pharmacists in insulin pen counseling and dispensing practices, as shown in **Table 2**. While specific areas show high adherence, others suggest the need for improvement. The results contribute valuable insights for designing targeted training programs to enhance pharmacists' proficiency in critical aspects of insulin pen counseling and dispensing.

**Table 1.** Demographic Data

| Demographics | Number of Pharmacies |
|---|---|
| Chain Pharmacies | 12 |
| Non-chain Pharmacies | 110 |
| Pharmacies in Urban areas | 97 |
| Pharmacies in Rural areas | 25 |
| Pharmacies with counseling area | 6 |
| Pharmacies with no counseling area | 116 |

In this simulated patient study focusing on insulin pen dispensing at community pharmacies, the data revealed a significant presence of non-chain pharmacies (110) compared to chain pharmacies (12). The majority of pharmacies were located in urban areas (97), with a smaller proportion situated in rural areas (25). Interestingly, only a minority of pharmacies had designated counseling areas (6), indicating potential challenges in providing private consultations for patients.

The management of diabetes with insulin administration has significant challenges in Pakistan. The development of insulin pens demonstrates an important achievement in the management of diabetes, with 82% of patients reporting that insulin penfils facilitate adherence to their regimen daily. However, delays in progression of insulin therapy and non-adherence is an ongoing and increasing issue. It is therefore crucial to understand patient problems from all of the perspectives of insulin delivery. It has been well documented that the pharmacy literature regarding pharmacist counseling improves patient therapy outcomes [21]. Access to quality healthcare services, including pharmaceutical patient care, remains limited in many parts of Pakistan. Our study aims to point out the quality of patient counseling and dispensing regarding insulin pens in community pharmacies in Pakistan using simulated patient methodology [22].

This study aimed to understand the related challenges faced in dispensing and counseling insulin pens from the perspectives of insulin users and patient-oriented problems, in addition to pharmacists' perceptions of what are important counseling points for their patients.

The three most important counseling points to patients can be linked to the usability of the pen; determining that the entire dose has been injected, reading the dose correctly, and adjusting if the dose is over-dialed. Firstly, we evaluated the current state of patient counseling and dispensing practices regarding insulin pens, assessing the critical role pharmacists play in supporting patients with diabetes management [23]. Secondly, we sought to identify areas of deficiency and challenges [24] that a patient or customer faces while purchasing an insulin pen. Evaluating the modification and awareness of methods that can be adopted within the existing system, pinpointing specific areas for improvement [25]. Lastly, the findings of our study can predict results and possible solutions for the problems that could guide

government and regulatory interventions to address the identified issues efficiently [26, 27].

Our study findings should be a clarion call for government action in several important perspectives. Firstly, there is an urgent need for monitored and standardized training programs for pharmacists, focusing on diabetes management and the proper counseling and dispensing of insulin pens [28]. These programs should be held in various settings and not only cover the technical aspects of insulin pen usage but also emphasize the importance of patient education and communication skills. Moreover, drug regulatory authorities must enforce guidelines for the dispensing of insulin pens, holding seminars and distributing pamphlets, ensuring that pharmacies adhere to best practices and prioritize patient safety [29, 30].

Findings from this study are consistent with and augment findings from previous studies examining patients counseling regarding insulin penfils. In contextualizing our study within the literature and research data collected in other countries, it is evident that previous research has analyzed patient counseling and dispensing practices in community pharmacies [31, 32]. However, few studies have specifically focused on insulin penfils, particularly within the Pakistan healthcare system and community settings. Our study thus fills a crucial gap in the literature by providing insights into the challenges and deficiencies in this area within Pakistan. Like findings from previous studies conducted in other countries [32-34], our study identified several distinct challenges specifically regarding Pakistan. One such challenge that is faced is the inadequacy of pharmacist training in diabetes management, including insulin pen counseling. The knowledge gap among pharmacists in community settings contributes to sub-optimal patient care and underscores the need for targeted interventions and educational programs to enhance pharmacist education and skills [20].

Another important issue identified in our study was the limited availability of educational resources and proper guidelines for both pharmacists and patients regarding insulin penfils usage and injection techniques. To address this problem, collaborative efforts between governmental authorities, pharmaceutical companies, and healthcare organizations are essential to enhance and disseminate educational materials dedicated to the Pakistan context. These materials should be accessible, comprehensible, and available in multiple languages to reach a wide audience effectively [1-5].

### *Limitation of Study*

It's important to note that our study concentrates on specific community pharmacies, limiting the generalizability of our results. Moreover, the use of simulated patients, though insightful, might not perfectly mirror authentic, varied scenarios in real-world pharmacy settings. These constraints emphasize the need for cautious interpretation and consideration of the unique context in which our research unfolds.

## Conclusion

The community pharmacy simulated patient study highlights the serious deficiencies in patient counseling and insulin pen dispensing procedures. The results highlight the critical need for focused interventions to improve patient-pharmacist communication and guarantee the safe and efficient delivery of insulin. Pharmacists can have a significant impact on patient outcomes and the promotion of improved diabetes management in the community by addressing these shortcomings. The adoption of ongoing education and the execution of standardized protocols are imperative measures in enhancing the caliber of treatment dispensed to patients requiring insulin therapy. Pharmacists, as front-line healthcare providers, are essential in equipping patients with the information and resources they require to successfully manage the challenges of diabetic self-management.

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