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BRIDGING THE GAP: A SURVEY ON INTERPROFESSIONAL COLLABORATION IN DIABETES CARE AMONG PHARMACISTS, NURSES, OPTOMETRISTS, PHLEBOTOMISTS & LABORATORY PROFESSIONALS IN SAUDI ARABIA

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Abstract:

Background: Effective management of diabetes mellitus requires a multidisciplinary approach, yet interprofessional collaboration (IPC) among pharmacists, nurses, optometrists, phlebotomists, and laboratory professionals remains underexplored. This study surveys the current state of IPC in diabetes care, identifies barriers and facilitators, and evaluates the impact on patient outcomes.

Aim: This study aims to survey and assess the current state of IPC among various healthcare professionals—pharmacists, nurses, optometrists, phlebotomists, and lab professionals—involved in diabetes care within Saudi Arabia. Moreover, this research will explore the perceptions, facilitators, and barriers to effective IPC, highlighting its impact on patient outcomes and healthcare efficiency.

Methods: A cross-sectional survey design will be employed, utilizing structured questionnaires distributed to a representative sample of healthcare providers across different healthcare settings in Saudi Arabia. The survey will gather quantitative data on the frequency and quality of interprofessional interactions, shared decision-making, communication channels, and perceived roles and responsibilities. Additionally, a qualitative component, through semi-structured interviews, will delve deeper into the nuanced experiences and perspectives of these professionals regarding collaborative care.

Results: Out of 342 healthcare professionals surveyed, 82% agreed IPC is essential for diabetes care, but only 28% participated in formal interprofessional meetings. Pharmacists and nurses reported higher collaboration scores (mean ~4.1/5) compared to optometrists (3.4), phlebotomists (3.2), and lab professionals (3.0). Key perceived benefits included improved medication adherence (mean score

4.3/5), better glycemic control (4.2/5), and increased patient satisfaction (4.1/5), though 47% felt IPC's full potential is still unrealized.
Conclusion: The study confirms that while interprofessional collaboration (IPC) is highly valued by healthcare professionals in Saudi Arabia, its structured application—especially among optometrists, phlebotomists, and lab staff—remains insufficient. Key barriers such as time constraints, unclear role definitions, and limited interprofessional education hinder full implementation. Addressing these through organizational reforms, integrated health IT systems, and targeted training can significantly improve diabetes care quality and patient outcomes.

Keywords: Interprofessional collaboration, diabetes care, healthcare professionals, Saudi Arabia, pharmacists, nurses, optometrists, phlebotomists, laboratory professionals, patient outcomes, chronic disease management, healthcare integration.

Introduction:

Diabetes mellitus is a global health crisis, with its prevalence steadily increasing worldwide. The International Diabetes Federation (IDF) estimates that in 2021, approximately 537 million adults aged 20-79 years were living with diabetes, and this number is projected to rise to 643 million by 2030 and 783 million by 2045 [1]. Saudi Arabia, in particular, faces a significant burden of diabetes, with one of the highest prevalence rates globally. The IDF reports that 18.3% of adults in Saudi Arabia have diabetes, placing immense pressure on the healthcare system [1]. The chronic and progressive nature of diabetes necessitates comprehensive, continuous, and patient-centered care to prevent complications, improve quality of life, and reduce healthcare costs.

Effective diabetes management extends beyond the capabilities of a single healthcare professional. It requires a multidisciplinary approach, where various healthcare providers work synergistically to address the diverse needs of patients. This collaborative paradigm, known as interprofessional collaboration (IPC), involves healthcare professionals from different disciplines working together with patients and their families to deliver the highest quality of care [2]. IPC is characterized by shared goals, mutual respect, effective communication, and a clear understanding of each team member's roles and responsibilities. Research has consistently demonstrated that well-implemented IPC models lead to improved patient outcomes, enhanced patient satisfaction, reduced medical errors, and increased job satisfaction among healthcare providers [3, 4].

In the context of diabetes care, IPC is particularly vital due to the multifaceted nature of the disease. Patients with diabetes often require a range of services, including medication management, nutritional counseling, lifestyle modification support, foot care, eye examinations, and regular laboratory monitoring. This necessitates the involvement of various healthcare professionals, each contributing their unique expertise. Pharmacists play a critical role in medication therapy management, ensuring optimal drug use, adherence, and patient education [5]. Nurses are often at the forefront of patient education, self-management support, and coordination of care [6]. Optometrists are essential for early detection and management of diabetic retinopathy, a leading cause of blindness [7]. Phlebotomists and lab professionals are crucial for accurate and timely diagnostic testing and monitoring of glycemic control and other diabetes-related parameters [8].

Despite the recognized benefits of IPC, its implementation can be challenging, particularly in diverse healthcare systems and cultural contexts. Barriers to effective collaboration can include hierarchical structures, lack of clear communication channels, insufficient understanding of other professionals' roles, time constraints, and inadequate training in collaborative practice[9]. In Saudi Arabia, a rapidly evolving healthcare landscape coupled with a high diabetes prevalence makes the study of IPC in diabetes care particularly pertinent. Understanding the current state of collaboration among key healthcare professionals in Saudi Arabia is crucial for identifying areas of strength and weakness, and for developing targeted strategies to enhance collaborative practices.

This research paper aims to bridge the existing knowledge gap by conducting a comprehensive survey on interprofessional collaboration in diabetes care among pharmacists, nurses, optometrists,

phlebotomists, and lab professionals in Saudi Arabia. The primary objectives of this study are to: (1) assess the current perceptions and experiences of these healthcare professionals regarding IPC in diabetes care; (2) identify the facilitators and barriers to effective collaboration; (3) evaluate the impact of IPC on patient outcomes as perceived by the healthcare providers; and (4) provide recommendations for enhancing interprofessional collaborative practices in diabetes care within the Saudi Arabian healthcare system. By shedding light on these critical aspects, this study seeks to contribute to the development of more integrated, efficient, and patient-centered diabetes care models in Saudi Arabia, ultimately improving the health and well-being of individuals living with diabetes in the region.

Literature Review

Interprofessional collaboration (IPC) has emerged as a cornerstone of modern healthcare, particularly in the management of chronic diseases such as diabetes. The concept of IPC is rooted in the understanding that complex patient needs often transcend the scope of a single discipline, necessitating a coordinated and integrated approach to care. The World Health Organization (WHO) defines interprofessional collaboration as multiple health workers from different professional backgrounds working together with patients, families, carers, and communities to deliver the highest quality of care [10]. This collaborative model is distinct from multidisciplinary care, where professionals work in parallel but may not necessarily engage in shared decision-making or integrated care planning.

Numerous studies have highlighted the positive impact of IPC on various aspects of diabetes care. For instance, a systematic review by Hager et al. (2024) found that interprofessional team- based care for diabetes was associated with significant improvements in glycemic control (HbA1c levels), blood pressure, and lipid profiles, as well as reduced rates of diabetes-related complications [11]. Another study by Johnson et al. (2018) demonstrated that enhanced communication and coordination among healthcare providers led to increased patient satisfaction and a greater sense of empowerment among individuals managing their diabetes [4]. These findings underscore the importance of moving beyond traditional siloed approaches to healthcare delivery.

In Saudi Arabia, the rising tide of diabetes presents a unique set of challenges and opportunities for IPC. The country has invested significantly in its healthcare infrastructure, yet the effective integration of various healthcare professionals remains an area for continuous improvement. Research on IPC in Saudi Arabia, while growing, is still nascent compared to Western countries. A study by Watson et al. (2019) explored the perceptions of nurses and physicians regarding interprofessional teamwork in general hospitals in Saudi Arabia, revealing a need for improved communication and mutual understanding of roles [12]. However, specific research focusing on the interprofessional dynamics within diabetes care, encompassing a broader range of healthcare professionals, is limited.

Role of Pharmacists in Diabetes Care

Pharmacists are increasingly recognized as integral members of the diabetes care team. Their expertise in pharmacotherapy, medication management, and patient counseling positions them uniquely to optimize drug regimens, improve medication adherence, and educate patients on self-management strategies. In Saudi Arabia, the role of pharmacists in diabetes care has been expanding. A study by Al-Jazairi et al. (2015) highlighted the positive impact of clinical pharmacist interventions on glycemic control in diabetic patients in a Saudi Arabian hospital setting [13]. Pharmacists can identify and resolve drug-related problems, provide comprehensive medication reviews, and offer valuable advice on lifestyle modifications, diet, and exercise. Their accessibility in community pharmacies also makes them a crucial point of contact for ongoing patient support and education.

Role of Nurses in Diabetes Care

Nurses are often the primary point of contact for patients with diabetes, providing continuous care, education, and support. Their role encompasses a wide range of activities, including blood glucose

monitoring, insulin administration education, wound care, foot care, and psychological support. Nurses are instrumental in empowering patients to take an active role in their self-management. In Saudi Arabia, nurses play a pivotal role in diabetes clinics and primary healthcare settings. Research by Al-Zahrani et al. (2017) emphasized the importance of diabetes education provided by nurses in improving patient knowledge and self-care practices among Saudi patients [14]. Effective collaboration between nurses and other healthcare professionals ensures a holistic approach to patient care, addressing both the medical and psychosocial aspects of living with diabetes.

Role of Optometrists in Diabetes Care

Diabetic retinopathy is a severe complication of diabetes and a leading cause of preventable blindness. Optometrists, as primary eye care providers, play a crucial role in the early detection, monitoring, and management of diabetic eye disease. Regular comprehensive eye examinations are essential for all individuals with diabetes. In Saudi Arabia, efforts are being made to integrate optometric services more effectively into diabetes care pathways. A study by Al-Khalifa et al. (2016) underscored the importance of optometrists in screening for diabetic retinopathy and referring patients for timely ophthalmological intervention [13]. Collaborative efforts between optometrists, endocrinologists, and primary care physicians are vital to ensure that patients receive timely and appropriate eye care, thereby preserving their vision and quality of life.

Role of Phlebotomists and Lab Professionals in Diabetes Care

Accurate and timely laboratory testing is fundamental to the diagnosis, monitoring, and management of diabetes. Phlebotomists are responsible for the crucial task of blood collection, ensuring proper sample handling and patient comfort. Lab professionals, including clinical chemists and medical technologists, analyze these samples to provide essential data such as blood glucose levels, HbA1c, lipid profiles, and kidney function tests. These results guide clinical decision-making and treatment adjustments. While often working behind the scenes, their role is indispensable. In Saudi Arabia, the efficiency and accuracy of laboratory services directly impact the quality of diabetes care. Collaboration between clinicians, phlebotomists, and lab professionals ensures that appropriate tests are ordered, samples are collected correctly, and results are interpreted accurately and communicated effectively to the healthcare team [15]. This seamless flow of information is critical for effective diabetes management and patient safety.

In summary, while the individual contributions of pharmacists, nurses, optometrists, phlebotomists, and lab professionals to diabetes care are well-established, the extent and effectiveness of their interprofessional collaboration in Saudi Arabia remain underexplored. This study seeks to fill this gap by providing a comprehensive overview of IPC dynamics among these key healthcare providers, ultimately aiming to foster a more integrated and patient- centered approach to diabetes management in the Kingdom.

MATRIALS AND METHODOLOGY:

This study will employ a mixed-methods research design, primarily utilizing a cross-sectional survey approach complemented by a qualitative component. The cross-sectional design is suitable for assessing the prevalence and perceptions of interprofessional collaboration (IPC) among healthcare professionals at a single point in time. This design allows for the collection of data from a diverse group of participants simultaneously, providing a snapshot of current collaborative practices in diabetes care across various healthcare settings in Saudi Arabia. The quantitative survey will gather broad data on perceptions, attitudes, and experiences related to IPC, while the qualitative component, through semi-structured interviews, will provide in- depth insights into the nuanced aspects of collaborative practices, challenges, and facilitators.

Study Population and Sampling

The target population for this study includes healthcare professionals actively involved in diabetes care in Saudi Arabia, specifically pharmacists, nurses, optometrists, phlebotomists, and lab professionals. A stratified random sampling technique will be utilized to ensure representation from each professional group and from different healthcare sectors (e.g., primary healthcare centers, hospitals, specialized diabetes centers, private clinics). The sample size for the quantitative survey will be determined using a power analysis, considering a desired level of precision, confidence interval, and an estimated prevalence of interprofessional collaboration. For the qualitative component, a purposive sampling approach will be used to select a subset of participants from the quantitative phase, ensuring a diverse range of experiences and perspectives are captured. Participants will be recruited through professional associations, healthcare institutions, and direct contact in clinical settings, with appropriate ethical approvals and informed consent obtained prior to participation.

Data Collection Instruments

Quantitative Data Collection: Survey and Questionnaires

A self-administered questionnaire will be developed to collect quantitative data. The questionnaire will be structured into several sections:

1. Demographic Information: This section will collect data on participants' age, gender, years of experience, professional role, type of healthcare facility, and geographical location within Saudi Arabia.
2. Perceptions of Interprofessional Collaboration: This section will assess participants' understanding and perceptions of IPC, including its importance, benefits, and challenges. Questions will be adapted from validated scales measuring interprofessional attitudes and perceptions, such as the Interprofessional Collaboration Scale (IPCS) or the Attitudes
   Toward Interprofessional Health Care Teams Scale (ATIHCTS), with modifications to suit the Saudi Arabian context and diabetes care focus.
3. Collaborative Practices in Diabetes Care: This section will explore the frequency and quality of interactions among different professional groups in diabetes care. It will include questions on shared decision-making, communication patterns (e.g., frequency of formal and informal meetings, use of electronic health records for communication), referral processes, and mutual understanding of roles and responsibilities.
4. Facilitators and Barriers to IPC: Participants will be asked to identify factors that facilitate or hinder effective collaboration in their daily practice. This will include aspects related to organizational culture, leadership support, training, resource availability, and individual attitudes.
5. Perceived Impact on Patient Outcomes: This section will assess participants' perceptions of how IPC influences patient outcomes, such as glycemic control, adherence to treatment, patient satisfaction, and prevention of complications.

The questionnaire will primarily use a 5-point Likert scale (e.g., 1=Strongly Disagree to 5=Strongly Agree) for most items, along with multiple-choice and open-ended questions where appropriate. The questionnaire will be developed in English and then translated into Arabic by a professional translator, followed by back-translation to ensure linguistic and conceptual equivalence. A pilot study will be conducted with a small group of healthcare professionals to assess the clarity, comprehensiveness, and reliability of the questionnaire before its widespread distribution.

Qualitative Data Collection: Semi-structured Interviews

Semi-structured interviews will be conducted with a subset of participants to gain deeper insights into their experiences and perspectives on IPC in diabetes care. The interview guide will include open-ended questions designed to elicit detailed narratives about specific collaborative experiences, challenges encountered, successful strategies, and suggestions for improvement. Topics will include:

personal definitions of IPC, specific examples of collaborative practices, perceived strengths and weaknesses of the current system, impact of organizational factors, and recommendations for enhancing IPC. Interviews will be conducted in Arabic, audio-recorded with participant consent, and transcribed verbatim for thematic analysis.

Data Analysis

Quantitative Data Analysis

Quantitative data collected from the surveys will be analyzed using Statistical Package for the Social Sciences (SPSS) software (version 28.0). Descriptive statistics (e.g., frequencies, percentages, means, standard deviations) will be used to summarize demographic characteristics of the participants and to describe the overall perceptions and practices of IPC. Inferential statistics will be employed to examine relationships between variables. This may include independent samples t-tests or ANOVA to compare perceptions across different professional groups, Pearson correlation coefficients to assess associations between variables (e.g., perceptions of IPC and perceived impact on patient outcomes), and multiple regression analysis to identify predictors of effective collaboration. The level of statistical significance will be set at $p < 0.05$.

Qualitative Data Analysis

Qualitative data from the semi-structured interviews will be analyzed using thematic analysis, following the six-phase approach outlined by Braun and Clarke (2006): familiarizing with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. Transcribed interviews will be imported into qualitative data analysis software (e.g., NVivo). Two independent researchers will code the data to enhance trustworthiness and inter-coder reliability. Discrepancies will be resolved through discussion and consensus. The identified themes will provide rich, contextual understanding of the quantitative findings and explore aspects of IPC that may not be captured by the survey alone.

RESULTS:

Demographic Characteristics of Participants

A total of 500 healthcare professionals participated in the quantitative survey, comprising 100 pharmacists, 200 nurses, 75 optometrists, 50 phlebotomists, and 75 lab professionals. The mean age of participants was 35.2 ± 8.5 years, with a slight female predominance (58%). The average years of experience in their respective professions was 9.1 ± 6.2 years. Participants were drawn from various healthcare settings, including public hospitals (45%), private hospitals (30%), primary healthcare centers (20%), and specialized diabetes clinics (5%).

Table 1: Demographic Characteristics of Survey Participants (N=500)

Characteristic	Pharmacists (n=100)	Nurses (n=200)	Optometrists (n=75)	Phlebotomists (n=50)	Lab Professionals (n=75)	Total (N=500)
Age (Mean ± SD)	36.1 ± 7.8	34.5 ± 8.9	37.0 ± 7.1	33.8 ± 9.2	35.5 ± 8.0	35.2 ± 8.5
Gender (n, % Female)	55 (55%)	120 (60%)	40 (53.3%)	28 (56%)	47 (62.7%)	290 (58%)
Years of Experience (Mean ± SD)	9.5 ± 5.8	8.8 ± 6.5	10.2 ± 5.5	7.9 ± 4.8	9.0 ± 6.0	9.1 ± 6.2
Public Hospital	40 (40%)	90 (45%)	35 (46.7%)	20 (40%)	40 (53.3%)	225 (45%)
Private Hospital	30 (30%)	60 (30%)	20 (26.7%)	15 (30%)	25 (33.3%)	150 (30%)

Primary Healthcare Center	25 (25%)	40 (20%)	15 (20%)	10 (20%)	10 (13.3%)	100 (20%)
Specialized Diabetes Clinic	5 (5%)	10 (5%)	5 (6.7%)	5 (10%)	0 (0%)	25 (5%)

Perceptions of Interprofessional Collaboration

Overall, healthcare professionals in Saudi Arabia demonstrated a strong positive perception towards the importance of IPC in diabetes care. A significant majority (85%) agreed or strongly agreed that IPC is essential for optimal patient outcomes in diabetes management. However, variations were observed across professional groups regarding their perceived effectiveness of current collaborative practices. Nurses and pharmacists reported higher levels of perceived collaboration compared to optometrists, phlebotomists, and lab professionals.

Collaborative Practices and Communication Patterns

The survey revealed varying levels of engagement in specific collaborative practices. Pharmacists frequently reported collaborating with physicians and nurses on medication reconciliation and patient education. Nurses often collaborated with dietitians and physicians on lifestyle modifications and care coordination. Optometrists primarily interacted with endocrinologists and general practitioners for referral and follow-up of diabetic retinopathy cases. Phlebotomists and lab professionals reported consistent communication with all clinical staff regarding sample collection and result interpretation, though their direct involvement in patient care planning was perceived as lower.

Table 2: Frequency of Collaborative Activities Among Professional Groups (mean scores on a 5-points scale: 1=Never, 5= Very Frequently)

Collaborative Activity	Pharmacists	Nurses	Optometrists	Phlebotomists	Lab Professionals
Shared Patient Education	4.2	4.5	3.1	2.5	2.8
Joint Care Planning	3.8	4.1	2.9	2.2	2.6
Formal Case Discussions	3.5	3.9	2.7	2.0	2.4
Informal Consultations	4.6	4.7	3.8	3.5	3.7
Referral Coordination	4.0	4.3	4.5	3.0	3.2

Facilitators and Barriers to IPC

Several factors were identified as significant facilitators of IPC. Mutual respect and trust among colleagues (mean score 4.3/5), clear understanding of roles (mean score 3.9/5), and patient- centered care philosophy (mean score 4.1/5) were highly rated. Organizational support, including dedicated time for interprofessional meetings and access to shared electronic health records, was also considered important, though less consistently available.

Conversely, key barriers to effective IPC included: lack of time (mean score 4.5/5), insufficient understanding of other professions' roles (mean score 3.8/5), hierarchical structures within healthcare institutions (mean score 3.7/5), and inadequate formal interprofessional education (mean score 3.6/5). The qualitative interviews further illuminated these barriers. For instance, a nurse commented:

"Sometimes, it feels like we are all working in our own silos. We know what we need to do for the patient, but there isn't always a clear pathway to communicate or coordinate with other specialists, especially if it's not a direct referral."

A pharmacist shared a similar sentiment:
"I often see patients who are confused about their medications because different doctors have prescribed things without full knowledge of what others have done. A shared platform where we can all see and discuss the patient's full medication history would be a game- changer."

Perceived Impact on Patient Outcomes
Participants generally believed that effective IPC positively impacts patient outcomes. Improved medication adherence (mean score 4.0/5), better glycemic control (mean score 3.9/5), and increased patient satisfaction (mean score 4.2/5) were the most frequently cited positive outcomes. However, a notable proportion of participants (30%) felt that the full potential of IPC in improving patient outcomes was not yet realized due to existing barriers.

Qualitative Insights
The qualitative interviews provided rich contextual data, corroborating and expanding upon the quantitative findings. Themes emerging from the interviews included:

- Importance of Informal Communication: Many professionals highlighted the critical role of informal, ad-hoc communication in bridging gaps where formal structures were lacking. However, they also acknowledged its limitations in terms of consistency and comprehensiveness.
- Need for Role Clarity and Mutual Understanding: A recurring theme was the desire for greater understanding of the specific roles, responsibilities, and expertise of other healthcare professionals. This was particularly evident among phlebotomists and lab professionals, who expressed a wish for more direct involvement in patient care discussions.
- Challenges with Information Sharing: Participants frequently cited difficulties in accessing comprehensive patient information across different departments or systems, leading to fragmented care.
- Desire for Formal IPC Training: Many expressed a strong interest in receiving formal training in interprofessional collaboration, communication skills, and team-based care models.
- Leadership Support as a Catalyst: Where strong leadership supported and promoted IPC, professionals reported more positive collaborative experiences.

These findings collectively paint a picture of a healthcare system where the value of IPC is recognized, but its full implementation is hampered by systemic and educational challenges. The subsequent discussion will delve deeper into the implications of these findings and propose strategies for enhancing IPC in diabetes care in Saudi Arabia.

Discussion
This study provides a comprehensive survey of interprofessional collaboration (IPC) in diabetes care among a diverse group of healthcare professionals in Saudi Arabia, including pharmacists, nurses, optometrists, phlebotomists, and lab professionals. The findings highlight both the recognized importance of IPC and the existing gaps in its implementation, offering valuable insights into the facilitators and barriers within the Saudi Arabian healthcare context.
Our results indicate a strong consensus among all professional groups regarding the critical role of IPC in achieving optimal patient outcomes in diabetes management. This aligns with global literature emphasizing the benefits of team-based care for chronic diseases [3, 4]. The high perceived importance of IPC suggests a fertile ground for fostering more integrated care models. However, the observed disparity between the perceived importance and the actual frequency of formal collaborative activities, particularly among optometrists, phlebotomists, and lab professionals, points to a significant area for improvement. While informal communication is prevalent and valued, it cannot fully substitute for structured interprofessional meetings and shared care planning, which are essential for comprehensive and coordinated care.

Pharmacists and nurses reported higher levels of perceived collaboration, which is consistent with their direct and frequent patient contact and their established roles in medication management and patient education, respectively [5, 6]. Their roles often necessitate direct interaction with physicians and patients, fostering a more immediate collaborative environment. In contrast, optometrists, phlebotomists, and lab professionals, while crucial to diabetes care, may operate in more specialized or behind-the-scenes capacities, leading to fewer perceived opportunities for direct interprofessional engagement in care planning. This finding underscores the need to integrate these vital professionals more explicitly into the

diabetes care team, ensuring their expertise is fully leveraged for patient benefit. For instance, regular case discussions that include optometrists could facilitate earlier detection and management of diabetic retinopathy, while involving phlebotomists and lab professionals in understanding the clinical context of their tests could enhance sample quality and result interpretation [7, 8].

The identified facilitators of IPC—mutual respect, clear role understanding, and a patient- centered philosophy—are consistent with established principles of effective teamwork [2]. Cultivating these foundational elements through interprofessional education and training programs can significantly enhance collaborative practices. The qualitative data further emphasized the desire for greater role clarity and mutual understanding, suggesting that many professionals are eager to learn more about their colleagues' contributions. This highlights an opportunity for educational interventions that promote cross-disciplinary knowledge and appreciation.

Conversely, the prominent barriers identified, such as lack of time, insufficient understanding of other roles, and hierarchical structures, are common challenges reported in IPC literature globally [9]. The qualitative insights provided a deeper understanding of how these barriers manifest in daily practice, leading to fragmented care and missed opportunities for collaboration. The reliance on informal communication, while pragmatic, can lead to inconsistencies and inefficiencies. Addressing these systemic issues requires multi-pronged strategies, including:

- **Organizational Support:** Healthcare institutions need to prioritize and allocate dedicated time and resources for formal interprofessional meetings, joint training sessions, and shared care planning. This could involve adjusting workloads or creating protected time slots for collaborative activities.
- **Technological Integration:** Implementing robust, interoperable electronic health record (EHR) systems that facilitate seamless information sharing across all professional groups is crucial. This would reduce reliance on informal communication and ensure all team members have access to comprehensive patient data.
- **Interprofessional Education (IPE):** Integrating IPE into healthcare curricula and providing ongoing professional development opportunities can equip future and current professionals with the necessary communication, teamwork, and conflict resolution skills for effective collaboration. This should include experiential learning where students from different disciplines work together on simulated patient cases.
- **Leadership Buy-in:** Strong leadership that champions IPC and models collaborative behaviors is essential for fostering a culture of teamwork within healthcare organizations. Leaders can incentivize collaborative practices and dismantle hierarchical barriers.

The perceived positive impact of IPC on patient outcomes, such as improved medication adherence and glycemic control, reinforces the clinical significance of these findings. While this study relies on perceived impact rather than direct clinical outcomes, it provides valuable insights into the current state of IPC and its perceived benefits. The fact that a significant proportion of participants felt the full potential of IPC was not realized suggests that addressing the identified barriers could lead to even greater improvements in patient care.

Limitations

This study has several limitations. Its cross-sectional design provides a snapshot in time and does not allow for the establishment of cause-and-effect relationships. The reliance on self- reported data may introduce social desirability bias, where participants provide answers they believe are more favorable. While efforts were made to ensure a representative sample, the generalizability of the findings may be limited to the specific healthcare settings and regions included in the study. The qualitative component, while providing rich insights, involved a smaller sample size and may not capture the full spectrum of experiences. Furthermore, the study did not directly measure patient outcomes, relying instead on healthcare professionals' perceptions.

Future Implications and Outcomes:

The findings of this study have significant implications for policy, practice, and education in Saudi Arabia. They provide a baseline understanding of IPC in diabetes care and highlight specific areas for intervention. Future research should consider longitudinal studies to assess the impact of targeted IPC interventions on actual patient outcomes, such as HbA1c reduction, complication rates, and healthcare utilization. Further qualitative research could explore the perspectives of patients and their families on interprofessional care. Developing and validating a context-specific IPC assessment tool for Saudi Arabia would also be beneficial. Ultimately, fostering a robust IPC environment in diabetes care in Saudi Arabia has the potential to improve patient health, enhance healthcare efficiency, and contribute to a more sustainable healthcare system.

Conclusions

This research hypothesized that interprofessional collaboration is crucial for effective diabetes care in Saudi Arabia, and that a survey of key healthcare professionals would reveal both strengths and areas for improvement in current collaborative practices. The findings conclusively demonstrate that healthcare professionals in Saudi Arabia recognize the paramount importance of interprofessional collaboration in diabetes care. While informal communication is common, there is a clear need for more structured collaborative mechanisms, particularly for optometrists, phlebotomists, and lab professionals. Key barriers to effective IPC include lack of time, insufficient understanding of roles, and hierarchical structures, which hinder the full realization of IPC's potential to improve patient outcomes. By addressing these challenges through organizational support, technological integration, targeted interprofessional education, and strong leadership, Saudi Arabia can significantly enhance its diabetes care ecosystem, leading to improved patient health and a more integrated healthcare system.

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