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ORIGINAL RESEARCH

Patient-Centered Care in Family Medicine: Strategies for Continuity and Comprehensive Care for Older Adults – A Mixed-Methods Study

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Introduction: Patient-centered care (PCC) is a crucial approach in family medicine, particularly for older adults with complex health needs. This study evaluates the implementation of PCC strategies and their impact on health outcomes for older adults in family medicine settings.

Methods: A convergent parallel mixed-methods study was conducted, involving 47 healthcare providers and 126 older adult patients in Riyadh, Saudi Arabia. Quantitative data were collected using structured surveys, while qualitative data were obtained through semi-structured interviews. Statistical analyses included chi-square tests, ANOVA, and effect size calculations to assess the impact of PCC strategies.

Results: Healthcare providers identified continuity of care programs (48.9%) and patient education (44.7%) as the most effective PCC strategies. Key challenges included time constraints (74.5%) and lack of resources (59.6%). Patients in the high PCC implementation group demonstrated significantly better health outcomes, including lower hospital readmission rates (15.9% vs 36.5%, p=0.002), improved chronic disease management (87.3% vs 66.7%, p=0.014), higher adherence to care plans (82.5% vs 60.3%, p=0.008), and increased patient satisfaction scores (mean 4.6 vs 3.9, p=0.001). Qualitative findings highlighted key themes, including communication challenges, patient empowerment, and the role of multidisciplinary teams.

Discussion: PCC strategies significantly enhance health outcomes and patient satisfaction among older adults in family medicine. However, implementation barriers such as time constraints, resource limitations, and coordination challenges must be addressed. The study underscores the need for systemic healthcare reforms to improve PCC delivery.

Conclusion: This study highlights the benefits of PCC in improving patient outcomes and satisfaction while identifying barriers that must be addressed for effective implementation. Greater investment in PCC initiatives, improved healthcare coordination, and professional training are essential to enhancing care quality for older adults.

Keywords: patient-centered care, family medicine, older adults, healthcare outcomes, mixed-methods study

Introduction

The increasing number of elderly individuals worldwide poses substantial difficulties and prospects for healthcare systems globally. With the increase in life expectancy, there is a growing occurrence of long-term health disorders, disabilities, and many health issues among older individuals.[1] This requires a change in the way healthcare is provided. Conventional methods, typically focused on immediate medical treatment, are insufficient in meeting the intricate and enduring requirements of this particular group.[2] Within this environment, patient-centered care (PCC) has become a crucial method, especially in the field of family medicine, to improve the quality of treatment given to older Patients.The user did not provide any text.[3,4]

The Growing Need for Patient-Centered Care

Patient-centered care is a guiding principle and method that prioritizes the individual patient by customizing healthcare to address their specific requirements, preferences, and values.[4] This method is especially vital in the field of family medicine, as it acts as the initial point of contact for the majority of patients and offers ongoing and comprehensive care

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throughout an individual's lifetime.[5,6] PCC, or Patient-Centered treatment, is crucial for older Patients with numerous healthcare demands since it guarantees coordinated, uninterrupted, and adaptable treatment that addresses their changing requirements.[3,7,8] The significance of Patient-Centered Care (PCC) in the healthcare of older people has been progressively highlighted by the World Health Organization (WHO) and many national health organizations.[9] Primary Care Coordination (PCC) is linked to enhanced health outcomes, increased patient satisfaction, and improved management of prevalent chronic diseases in older Patients.[10–12] The necessity for adopting such a methodology is emphasized by the demographic transition towards an increasingly elderly population, which presents a substantial challenge to healthcare systems.[13] By 2050, the worldwide population of individuals aged 60 and older is projected to increase double, reaching around 2.1 billion. Many of these people will need intricate and prolonged care.[14]

Challenges in Providing Continuity and Comprehensive Care for Older Adults

The maintenance of consistent care, which is a fundamental aspect of Patient-Centered Care (PCC), presents notable difficulties while providing care for elderly individuals.[15] This particular group frequently need care from several physicians in various settings, hence heightening the likelihood of fragmented care, which in turn might result in unfavorable health outcomes.[16] Continuity of care refers to the sustained and unbroken connection between the patient and their healthcare providers, guaranteeing that care is well-coordinated throughout various levels and locations of care.[17,18] For older individuals, maintaining continuity is crucial for effectively treating chronic conditions, minimizing avoidable hospitalizations, and ensuring that their treatment remains in line with their choices and life objectives.[19] Ensuring continuity and comprehensiveness in the care of older individuals is filled with obstacles. The healthcare requirements of elderly individuals are frequently intricate, necessitating the participation of numerous healthcare providers.[20] If not appropriately coordinated, this might result in fragmented care.[21] In addition, the existing healthcare systems, namely in the field of family medicine, are frequently structured to prioritize short-term care rather than long-term and all-encompassing care.[22] Such misalignment can lead to deficiencies in healthcare, inadequate communication among healthcare professionals, and a failure to provide necessary follow-up, all of which can have adverse effects on the health outcomes of older Patients.[23] Furthermore, elderly individuals frequently undergo several care transitions, including relocating from their residence to a hospital, subsequently to a rehabilitation center, and either returning home or being transferred to a long-term care facility.[24] Each of these changes poses a risk of care discontinuity, when crucial information may be lost or miscommunicated, resulting in possible adverse consequences.[25] Effective management of care during these transitions is crucial for preserving seamless continuity and ensuring that care stays focused on the needs and preferences of the patient.

The Role of Family Medicine in Patient-Centered Care

Family medicine, because to its comprehensive and extended method of patient care, is particularly well-suited to adopt and advocate for Patient-Centered Care (PCC), especially for elderly individuals.[26] Family physicians and nurses frequently establish enduring connections with their patients, offering a continuous and comprehensive approach to healthcare that is crucial for addressing the intricate health requirements of older individuals.[27] This specialization is inherently structured to provide comprehensive care that encompasses all aspects of life, including physical, emotional, and social health, which are all essential elements of patient-centered care (PCC).[3,28,29] Regarding older Patients, family medicine practitioners frequently have the task of overseeing numerous chronic illnesses, coordinating healthcare with specialists, and ensuring that the patient's treatment plan is in line with their own objectives and values.[30] The comprehensive approach is essential for meeting the complex requirements of older Patients, who may need a variety of services ranging from preventive care to palliative care.[31] Furthermore, the focus on continuity of treatment in family medicine makes it particularly well-suited to address the ongoing health requirements of older individuals, offering a reliable and consistent point of contact within the healthcare system.[32] Family medicine is essential for coordinating care in various settings, including hospitals, rehabilitation centers, and home care. Coordination is crucial to maintain a continuous and comprehensive care system, hence reducing the likelihood of fragmented care.[33] Family physicians and nurses frequently play a central role in coordinating healthcare efforts, collaborating closely with other healthcare providers, patients, and their families to ensure that care is smooth and in line with the patient's preferences.[34]

Strategies for Enhancing Patient-Centered Care in Family Medicine

In order to successfully execute PCC in the field of family medicine, specifically while dealing with older Patients, it is important to take into account various tactics.[35] These solutions should tackle the difficulties of maintaining consistency and inclusiveness in healthcare, guaranteeing that older individuals receive top-notch care that is specifically adapted to their unique requirements.[36] One crucial approach is the incorporation of care across several venues. This entails developing systems that facilitate enhanced communication and information exchange across diverse healthcare practitioners, guaranteeing that all members of the healthcare team possess timely and precise information regarding the patient's health condition and treatment strategy.[37] Electronic health records (EHRs) are a vital component in integrating healthcare systems, since they facilitate smooth communication between healthcare practitioners and minimize the potential for information loss while transitioning between different stages of care.[38] Another crucial tactic is the implementation of a collaborative approach to healthcare. In the field of family medicine, this refers to the participation of a diverse group of healthcare professionals, such as nurses, social workers, pharmacists, and specialists, who work together to offer thorough treatment that encompasses all areas of the patient's health.[39] The utilization of a team-based approach guarantees that the patient receives well-coordinated care, since each member of the team contributes their specialized knowledge to develop a comprehensive care plan that is focused on the patient's individual requirements and preferences.[40] Moreover, patient engagement is an essential element of patient-centered care (PCC). Facilitating the participation of elderly individuals in their healthcare entails providing them with information and including them in the decision-making process. It also requires respecting their choices and empowering them to actively manage their own health.[41,42]

In this study, patient-centered care (PCC) was implemented in primary healthcare centers and family medicine clinics in Riyadh, Saudi Arabia, through five key strategies: continuity of care programs, comprehensive health assessments, multidisciplinary team collaboration, patient and family education programs, and enhanced communication. Patients were assigned a primary healthcare provider to ensure longitudinal care coordination, supported by electronic health records (EHRs) for seamless information sharing. Comprehensive health assessments included evaluations of chronic disease status, functional ability, and psychosocial health, guiding personalized care plans. A multidisciplinary team—comprising physicians, nurses, pharmacists, social workers, and other specialists—collaborated regularly to provide holistic care.

Aim of the Study

The aim of this study is to explore and evaluate the strategies used in family medicine to implement patient-centered care (PCC) with a focus on ensuring continuity and comprehensive care for older adults. The study seeks to identify the effectiveness of these strategies, understand the challenges faced by healthcare providers, and assess the impact of PCC on health outcomes among older adult patients.

Research Question

What are the most effective strategies for implementing patient-centered care in family medicine to enhance continuity and comprehensive care for older adults?

Materials and Methods

Study Design and Setting

This study employed a convergent parallel mixed-methods design to assess the implementation of patient-centered care (PCC) strategies in family medicine. The study was conducted in primary healthcare centers and family medicine clinics in Riyadh, Saudi Arabia, which serve as the primary point of care for older adults.

Quantitative Data

Sample

The quantitative component of the study involved 47 healthcare providers and 126 older adult patients. The sample was designed to ensure a representative distribution across different professional roles and various demographic groups

among the patients. The sample consisted of older adult patients aged 65 years and above, recruited from family medicine clinics in Riyadh, Saudi Arabia.

Inclusion and Exclusion Criteria

Inclusion Criteria

- Adults aged 65 years or older receiving care at the selected healthcare facilities.
- Patients with at least one chronic condition requiring ongoing medical management.
- Healthcare providers (physicians, nurses, allied health professionals) directly involved in PCC implementation.

Exclusion Criteria

- Patients with severe cognitive impairment (eg, advanced dementia) that prevented informed participation.
- Individuals receiving end-of-life or palliative care who were not actively involved in PCC interventions.
- Patients unable to provide informed consent (unless legally authorized representatives consented on their behalf).
- Providers with less than six months of experience in the facility.

Sample Size Calculation and Statistical Power

A power analysis was conducted to determine the required sample size for detecting significant differences in key outcomes between the high PCC and low PCC groups. Based on prior studies and expected effect sizes, the calculation used the following parameters:

- Expected effect size (Cohen's d) = 0.3
- Statistical power = 0.8
- Significance level (α) = 0.05

The power analysis indicated that a minimum sample size of 126 older adult patients was required to detect significant differences in patient outcomes. Similarly, 47 healthcare providers were recruited to ensure diverse perspectives on PCC implementation. A total of 160 eligible patients were approached, of whom 126 participated, yielding a survey response rate of 78.8%. Among healthcare providers, 50 were invited, and 47 participated, resulting in a response rate of 94.0%.

Survey Instrument

The survey instruments were carefully developed and validated for this study, drawing from existing literature and PCC scales. The healthcare provider survey focused on several key areas, including:

- The types of PCC strategies currently employed.
- The perceived effectiveness of these strategies in ensuring continuity and comprehensive care.
- The barriers and challenges faced in implementing these strategies.
- Demographic information, such as age, years of experience, and professional

Development of the Questionnaire

Initial Item Generation

- The development of the questionnaire began with an extensive review of the literature to identify key concepts and variables relevant to patient-centered care in family medicine, especially for older adults. Simultaneously, a series of preliminary focus group discussions were conducted involving family medicine practitioners, geriatric care experts, and patient representatives. The aim was to gather insights into the practical aspects of patient-centered care and identify elements that are crucial from both provider and patient perspectives.

- Based on these inputs, an initial pool of items was generated, reflecting the dimensions of care continuity, patient empowerment, interdisciplinary collaboration, and patient satisfaction. Each item was designed to capture specific aspects of the patient and healthcare provider interactions and the effectiveness of communication strategies within care settings.

Expert Panel Review

- To ensure content validity and relevance, the initial set of items was reviewed by a steering committee consisting of five experts in geriatric medicine, patient care quality, and questionnaire development. The experts evaluated each item for its clarity, relevance, and alignment with the study's objectives. They were asked to provide feedback on the appropriateness of item wording, the scaling method, and the overall structure of the questionnaire.
- This iterative process led to refinements in the wording and scaling of items to improve understandability and response accuracy. Some items were merged or eliminated based on redundancy or lack of direct relevance to the study aims.

Pilot Testing and Refinement

- The revised questionnaire was pilot tested with a sample of 30 older adults receiving care in a family medicine setting. This step was crucial for assessing the questionnaire's reliability and initial validity. Participants were asked to complete the questionnaire and participate in a brief interview to provide feedback on their understanding of the questions and the relevance of the items to their experiences with healthcare services.
- Feedback from the pilot test was used to make final adjustments to the questionnaire. This included simplifying some of the medical jargon based on patient feedback, adjusting the layout for easier comprehension, and refining the response options for better granularity.

Validity and Reliability Testing

- Following the pilot test, the questionnaire underwent a rigorous validity and reliability testing phase. Reliability was assessed using Cronbach's alpha to measure the internal consistency of the scales, with a value of 0.92 indicating excellent consistency. Construct validity was examined through exploratory factor analysis, which confirmed the hypothesized dimensions of the questionnaire.
- The test-retest method was employed over a two-week interval with a subset of the original pilot participants to assess the stability of the responses. The high reliability coefficient (0.89) indicated good stability of the questionnaire over time.

Final Questionnaire

- The final version of the questionnaire consists of 25 items distributed across four main domains: Care Continuity, Patient Empowerment, Interdisciplinary Collaboration, and Patient Satisfaction. Each item is rated on a 5-point Likert scale ranging from "strongly disagree" to "strongly agree", allowing for a nuanced assessment of patient-centered care practices.

The Patient Survey was Designed to Assess

- Patients' experiences with care continuity and comprehensiveness.
- Satisfaction with the care received.
- Health outcomes associated with the implementation of PCC strategies.
- Demographic information, including age, gender, education level, and health status.

The survey included a mix of Likert-scale items, multiple-choice questions, and open-ended questions to capture both quantitative data and additional qualitative insights.

Incorporation of the SF-36 Health Survey

To enhance the robustness of our assessment of health-related quality of life among elderly patients, we have incorporated the SF-36 Health Survey into our study design. This well-validated tool is widely used for measuring health status and outcomes from the patient's perspective, covering eight health domains including physical functioning, role limitations due to physical health problems, bodily pain, general health perceptions, vitality, social functioning, role limitations due to emotional problems, and mental health.

Data Collection

Data collection took place over a two-month period, from July to August 2024. Surveys were administered both electronically and in person, depending on participant preferences. Trained research assistants were available to help participants with the survey, ensuring that questions were clearly understood, and responses accurately reflected the participants' experiences and perceptions. Data on readmissions was collected using electronic health records (EHRs), which were regularly updated to reflect any new admissions. This system ensures comprehensive data capture across all networked healthcare facilities.

Statistical Analysis

Quantitative data were analyzed using IBM SPSS Statistics (version 26). Descriptive statistics were calculated for demographic characteristics, and chi-square tests and ANOVA were used to compare health outcomes across PCC implementation groups. Effect sizes were reported using Cohen's d for differences in means (eg, patient satisfaction, adherence), Cramer's V for associations in categorical variables (eg, hospital readmission rates), and partial eta squared (η^2) for ANOVA results assessing the impact of PCC strategies. A significance level of $p < 0.05$ was applied, with effect sizes interpreted according to standard benchmarks (small: 0.01, medium: 0.06, large: 0.14). Due to the exploratory nature of the study, no corrections for multiple testing were applied.

Qualitative Data

Sample

The qualitative component involved a purposive sample of 12 healthcare providers and 11 older adult patients who participated in semi-structured interviews. Participants were selected based on their involvement in PCC initiatives, diversity in professional roles (for providers), and a range of experiences with healthcare services (for patients). This approach ensured that the study captured a wide array of perspectives and insights.

Interviews

The semi-structured interviews were conducted in July 2024. For healthcare providers, the interview guide included questions related to:

Qualitative Data Collection

Semi-Structured Interviews

The qualitative component of our study utilized semi-structured interviews to explore the experiences and perspectives of both healthcare providers and older adult patients regarding patient-centered care. The interviews were designed to delve into personal experiences, perceived effectiveness of care strategies, and potential areas for improvement. Below are the exact questions asked during these interviews, structured around key themes:

For Healthcare Providers

1. Experiences with Implementing Patient-Centered Care:
   - Can you describe your experiences with implementing patient-centered care strategies in your practice?
   - What changes have you observed in patient outcomes following the implementation of these strategies?

2. Challenges in Ensuring Continuity and Comprehensive Care:
   - What are the main challenges you face in maintaining continuity and comprehensiveness in care for older adults?
   - How do you manage these challenges on a daily basis?
3. Impact on Patient Outcomes:
   - In your opinion, how have patient-centered care strategies impacted the health outcomes of your patients?
   - Can you share a specific instance where patient-centered care made a significant difference in a patient's health management?
4. Suggestions for Improvement:
   - Based on your experiences, what improvements would you suggest in the current approaches to patient-centered care?
   - Are there resources or tools that you think could enhance the effectiveness of these care strategies?

For Older Adult Patients

1. Personal Experiences with Healthcare:
   - How would you describe your overall experience with the healthcare services you have received?
   - Are there aspects of the care that you find particularly helpful or problematic?
2. Continuity and Comprehensiveness of Care:
   - Can you discuss how continuous and comprehensive your care has been? Have there been any gaps or issues?
   - How well do your healthcare providers coordinate among themselves and with you in managing your health?
3. Challenges in Receiving Care:
   - What barriers or challenges have you faced in receiving coordinated and comprehensive care?
   - How do these challenges affect your day-to-day life and health management?
4. Overall Satisfaction with Care:
   - How satisfied are you with the care you receive, particularly in terms of understanding and managing your health conditions?
   - What changes would you suggest to improve your satisfaction with the healthcare services?

Focus Group Discussions

Focus group discussions were conducted to gather collective insights and feedback on the effectiveness and impact of patient-centered care strategies from a group perspective. The discussions were structured around the following questions:

1. Effectiveness of Patient-Centered Care:
   - As a group, how effective do you find the current patient-centered care strategies in addressing your health needs?
   - What specific aspects of these strategies do you find most beneficial?
2. Suggestions for Enhanced Care:
   - What collective improvements would you like to see in the patient-centered care provided?
   - Are there particular strategies or programs you believe should be implemented or expanded?

Interviews were conducted in a private, comfortable setting, either in person at the healthcare facility or via video conferencing, depending on the participants' preferences. Each interview lasted between 45 and 60 minutes and was conducted in the participant's preferred language (Arabic or English). Interviews were audio-recorded with participants' consent and transcribed verbatim.

Qualitative Analysis

The qualitative data were analyzed using NVivo software, following a thematic analysis approach. The analysis involved several key steps:

1. **Familiarization**: Researchers thoroughly read and re-read the transcripts to immerse themselves in the data and gain an initial understanding.
2. **Coding**: Initial codes were generated to identify significant features of the data. These codes were developed inductively, based on the content of the interviews, and were applied across the dataset.
3. **Theme Development**: The codes were collated into potential themes, which were reviewed and refined to ensure they accurately reflected the data and were distinct from one another.
4. **Theme Review**: Themes were further examined to ensure they captured the essence of the data and were supported by the evidence.
5. **Defining and Naming Themes**: Each theme was clearly defined, and its scope and relevance were described in detail. Representative quotations from the interviews were selected to illustrate each theme.
6. **Final Analysis**: The final themes were used to construct a coherent narrative that captured the key insights from the qualitative data. This narrative was then integrated with the quantitative findings to provide a comprehensive understanding of the research problem.

Throughout the qualitative analysis, rigorous measures were taken to ensure reliability and validity, including peer debriefing and member checking. The research team regularly discussed the coding process, themes, and interpretations to ensure consistency and credibility in the findings.

Integration of Quantitative and Qualitative Data

After both the quantitative and qualitative data were analyzed, the findings were integrated to draw comprehensive conclusions. This integration involved:

- **Data Triangulation**: Comparing and contrasting the quantitative and qualitative findings to identify areas of convergence, divergence, and complementarity.
- **Joint Displays**: Creating tables and figures that visually integrated the quantitative and qualitative data, highlighting key insights and supporting evidence from both strands.
- **Interpretive Analysis**: Analyzing the integrated data to develop meta-inferences that offered a deeper understanding of the strategies for implementing PCC in family medicine and their impact on continuity and comprehensive care for older adults.

Ethical Considerations

The study was conducted in compliance with the ethical standards outlined in the Helsinki Declaration. Ethical approval was obtained from the King Saud University Institutional Review Board (IRB) (24–669) in 2 July 2024.

> Participants were provided with detailed information about the study's purpose, procedures, risks, and benefits. Participants provided informed consent, which included permission for the publication of anonymized responses and direct quotes to ensure confidentiality and compliance with ethical guidelines.

Data were securely stored on password-protected computers, with access restricted to authorized members of the research team. All data will be retained for five years following publication, after which they will be securely destroyed.

Results

The demographic characteristics presented in Table 1 shows that the majority of healthcare providers are relatively young, with nearly 55.3% under the age of 50, and most have over five years of professional experience. In contrast, the older adult patients are predominantly in the 60–79 age range, reflecting a typical aging population, with 40.5% aged

Table 1 Demographic Characteristics of Healthcare Providers and Older Adult Patients

Demographic Variable	Healthcare Providers (n=47)	Older Adult Patients (n=126)
Age (years)		
30–39	15 (31.9%)	–
40–49	11 (23.4%)	–
50–59	7 (14.9%)	–
60–69	10 (21.3%)	51 (40.5%)
70–79	3 (6.4%)	48 (38.1%)
≥80	1 (2.1%)	27 (21.4%)
Gender		
Male	22 (46.8%)	58 (46.0%)
Female	25 (53.2%)	68 (54.0%)
Years of Experience (Providers)		
<5	8 (17.0%)	–
5–10	14 (29.8%)	–
11–15	15 (31.9%)	–
>15	10 (21.3%)	–
Education Level (Patients)		
Primary School	–	19 (15.1%)
High School	–	32 (25.4%)
Bachelor's Degree	–	51 (40.5%)
Master's/Doctorate	–	24 (19.0%)
Living Situation		
Living Alone	–	26 (20.6%)
Living with Family	–	89 (70.6%)
Living in Assisted Facility	–	11 (8.7%)
Chronic Conditions (Patients)		
Hypertension	–	74 (58.7%)
Diabetes	–	68 (54.0%)
Cardiovascular Disease	–	43 (34.1%)
Arthritis	–	52 (41.3%)
COPD/Asthma	–	28 (22.2%)
No Chronic Conditions	–	19 (15.1%)

60–69 and 38.1% aged 70–79. Gender distribution among both groups is relatively balanced, with a slight female majority. A significant portion of the older adult patients live with family (70.6%), which may influence their healthcare needs and support systems, while 20.6% live alone, potentially indicating a higher need for comprehensive care and continuity in their healthcare plans. The prevalence of chronic conditions among the older adults, particularly hypertension (58.7%) and diabetes (54.0%), underscores the importance of patient-centered care strategies tailored to managing multiple chronic conditions.

Figure 1 presents healthcare providers' perceptions of the effectiveness of various patient-centered care (PCC) strategies. The data indicate that Continuity of Care Programs and Patient and Family Education Programs are regarded as the most effective strategies, with 48.9% and 44.7% of providers, respectively, rating them as "Very Effective." Multidisciplinary Team Collaboration also stands out, with 42.6% of providers considering it "Very Effective" and another 38.3% rating it as "Effective", highlighting its importance in comprehensive care delivery. Enhanced Communication Tools are widely viewed as beneficial, with a combined 83% of providers finding them either "Very Effective" or "Effective", though a small percentage (4.3%) see them as less effective. Comprehensive Health Assessments are perceived as somewhat less impactful, with 31.9% considering them "Very Effective", but a notable 21.3% of providers find them only "Somewhat Effective."

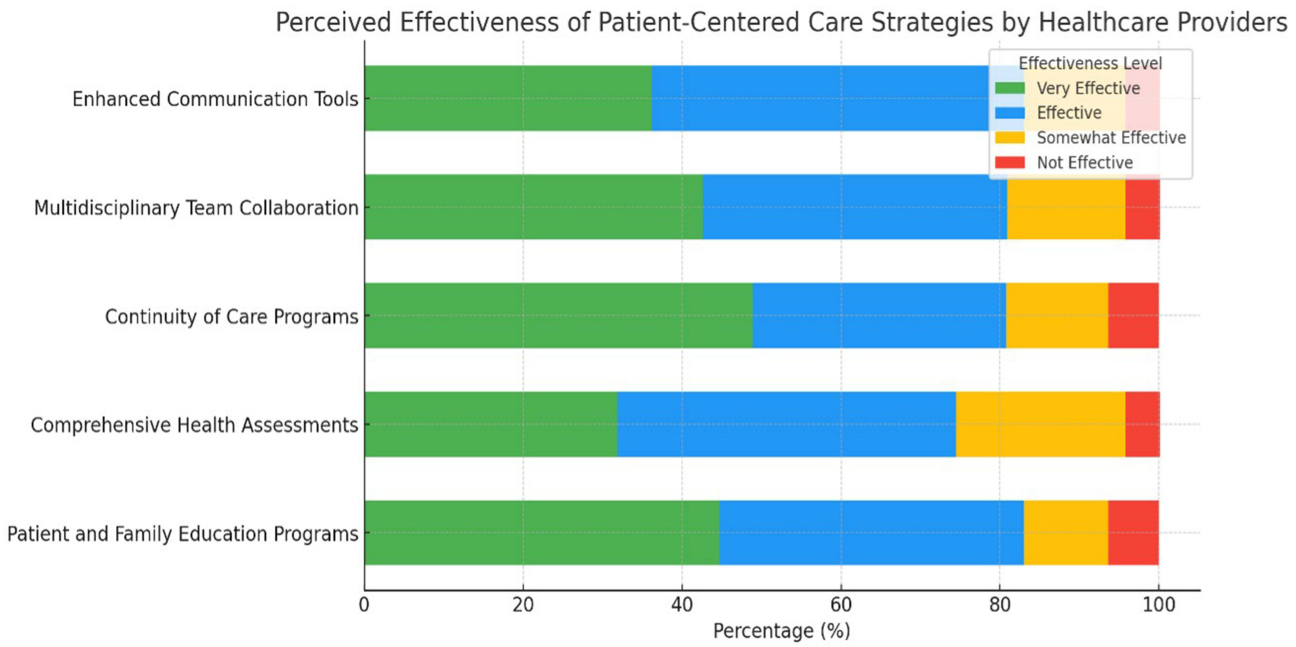

Figure 1 Perceived Effectiveness of Patient-Centered Care Strategies by Healthcare Providers.

Table 2 highlights the primary challenges faced by healthcare providers in implementing patient-centered care (PCC) strategies. The most significant barrier reported is time constraints, with 74.5% of providers indicating this as a major issue. This suggests that the demands of PCC may not align well with the current workload or time availability in healthcare settings. Additionally, 59.6% of providers cited a lack of resources as a critical challenge, underscoring the need for better support and infrastructure to effectively deliver PCC. Difficulty in coordinating multidisciplinary teams (44.7%) and insufficient training on PCC approaches (46.8%) also emerged as notable barriers, reflecting the complexity of implementing PCC in a team-based care environment. Patient resistance to change (31.9%) and communication barriers, such as language and literacy issues (40.4%), further complicate the effective delivery of PCC, indicating that both provider and patient-related factors must be addressed to enhance the implementation of these strategies.

The results presented in Figure 2 highlight the overall satisfaction of older adult patients with various aspects of their care, emphasizing the continuity and comprehensiveness of care they received. A significant proportion of patients expressed being either "Very Satisfied" or "Satisfied" with most aspects of their care. Specifically, 76.9% of patients were satisfied with the continuity of care, and 75.4% were satisfied with the comprehensiveness of health assessments. Satisfaction with access to multidisciplinary care teams was slightly lower, with 69.8% of patients reporting satisfaction. The clarity and communication of care plans garnered a high satisfaction rate of 79.4%, indicating that most patients felt well-informed about their care. Additionally, involvement in decision-making saw 76.2% of patients expressing satisfaction, underscoring the importance of patient engagement in healthcare decisions.

Table 2 Challenges Faced by Healthcare Providers in Implementing PCC

Challenge	Frequency (n=47)	Percentage
Time Constraints	35	74.5%
Lack of Resources	28	59.6%
Difficulty in Coordinating Multidisciplinary Teams	21	44.7%
Patient Resistance to Change	15	31.9%
Insufficient Training on PCC Approaches	22	46.8%
Communication Barriers (Language, Literacy)	19	40.4%

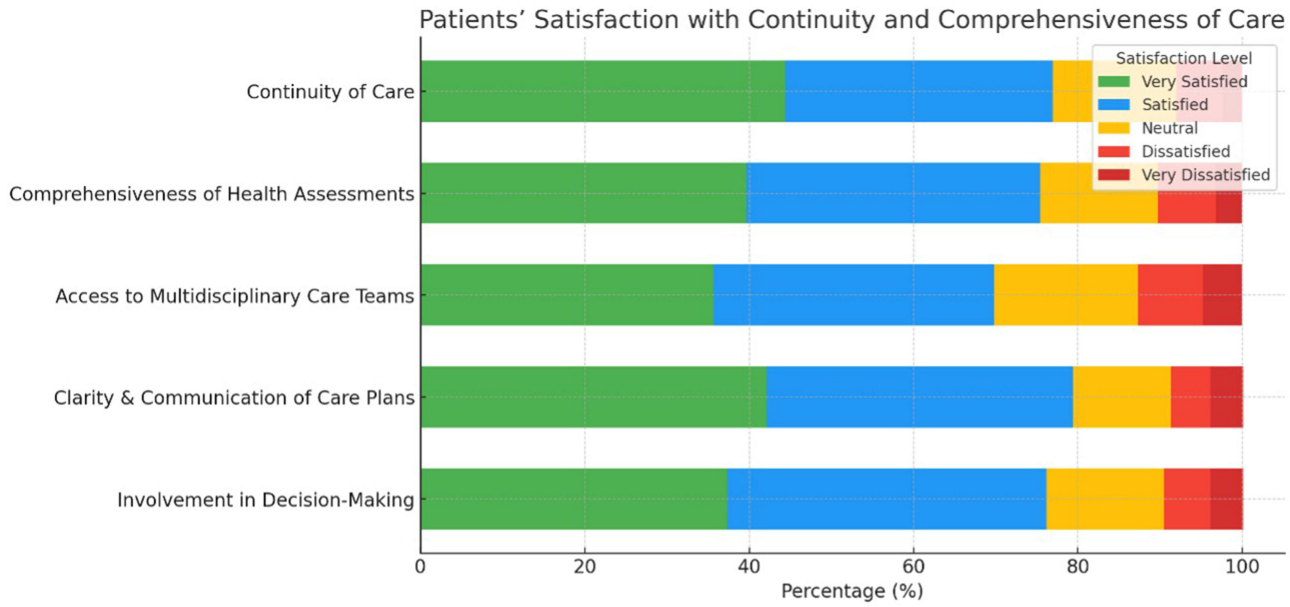

Figure 2 Patients' Satisfaction with Continuity and Comprehensiveness of Care.

Table 3 provides a comprehensive overview of the key themes identified from qualitative interviews with both healthcare providers and older adult patients. The table highlights the nuanced challenges and opportunities in implementing patient-centered care (PCC) within family medicine. Themes such as "Communication and Coordination" underscore the critical role of clear communication, and the ongoing challenges posed by coordination across multidisciplinary teams. Providers emphasized the difficulties in maintaining consistent communication, especially during care transitions, which patients echoed in their frustrations about repeating medical histories and understanding medical terminology. The theme of "Patient Involvement and Empowerment" illustrates the significant impact of involving

Table 3 Themes Identified from Qualitative Interviews with Healthcare Providers and Older Adult Patients

Theme	Sub-Themes	Example Quotations (Healthcare Providers)	Example Quotations (Older Adult Patients)
Communication and Coordination	1. Importance of Clear Communication	"Ensuring everyone is on the same page, especially during care transitions, is a big challenge. Miscommunication can easily lead to errors or delays in patient care." (Provider 3)	"Sometimes I don't understand what the doctors are saying. They use too many medical terms." (Patient 7)
	2. Coordination Challenges	"Coordinating care between different specialists and departments is difficult. There's often a disconnect, which impacts the continuity of care for our patients." (Provider 5)	"I've had to repeat my medical history several times to different doctors. It's frustrating when they don't seem to talk to each other." (Patient 4)
	3. Use of Technology in Communication	"While electronic health records help, they aren't always accessible or used effectively by everyone involved in a patient's care, leading to gaps in communication." (Provider 8)	"I like when my results are emailed to me, but sometimes I still get calls for things I've already seen." (Patient 10)
Patient Involvement and Empowerment	1. Patient Education and Understanding	"When patients understand their care plan, they are more likely to follow through with their treatments. Education is crucial, but it needs to be in a language and format they understand." (Provider 6)	"The nurse explained everything to me in a way that I could understand. It made me feel more in control of my health." (Patient 2)
	2. Decision-Making Involvement	"Involving patients in decisions about their care makes them feel valued and respected. It also leads to better adherence to treatment plans." (Provider 2)	"They asked me what I wanted, and I felt like my opinion mattered for the first time." (Patient 1)
	3. Empowerment through Self-Management	"Empowering patients to manage their conditions, with tools and support, improves their confidence and outcomes, but it requires ongoing education and encouragement." (Provider 9)	"I've started keeping track of my blood sugar on my own. It makes me feel like I'm really doing something for my health." (Patient 5)

(*Continued*)

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Table 3 (Continued).

Theme	Sub-Themes	Example Quotations (Healthcare Providers)	Example Quotations (Older Adult Patients)
Resource Limitations	1. Time Constraints	"Sometimes, we are just too stretched thin to provide the level of care we want to. We have so many patients and not enough time for each one." (Provider 1)	"The doctor seemed rushed. I didn't feel like I had enough time to ask all my questions." (Patient 3)
	2. Lack of Staff and Resources	"The shortage of nurses and support staff is a constant issue. It limits our ability to deliver comprehensive care, especially in a patient-centered manner." (Provider 4)	"I wish there were more people around to help when I'm in the clinic. Sometimes I feel like I'm just waiting forever." (Patient 8)
	3. Inadequate Training on PCC	"Many of us haven't received enough training on how to effectively implement PCC. It's something we're learning on the job, which isn't ideal for providing consistent care." (Provider 10)	N/A
Cultural and Social Barriers	1. Language Barriers	"Communication with older patients who speak different dialects or have low literacy is challenging. It's hard to ensure they fully understand their care plans." (Provider 7)	"It's hard to follow instructions when they're in a language I don't fully understand." (Patient 9)
	2. Resistance to Change	"Older patients often prefer traditional methods and are hesitant to accept new ways of care, which makes implementing new PCC strategies difficult." (Provider 11)	"I've been taking my medicines a certain way for years, and I don't like changing that." (Patient 6)
	3. Family Dynamics and Influence	"Family members often have a strong influence on the patient's decisions, which can be both helpful and challenging, depending on their level of understanding and involvement." (Provider 12)	"My daughter always comes with me to appointments. She helps me understand what's going on, but sometimes I wish the doctor would speak to me directly." (Patient 11)
Positive Impact of Multidisciplinary Teams	1. Improved Patient Outcomes	"Working closely with a team of specialists allows us to provide comprehensive care, and we've seen better outcomes as a result of this collaborative approach." (Provider 9)	"I feel more confident knowing that my doctor works with a team who looks after all my needs." (Patient 3)
	2. Challenges in Team Collaboration	"Collaborating with different professionals is beneficial, but it requires clear communication and shared goals. Without that, the team's efforts can become fragmented." (Provider 6)	"Sometimes it feels like I'm getting different advice from different doctors, and it's confusing." (Patient 4)
	3. Role of Leadership in Team Dynamics	"Effective leadership is crucial in multidisciplinary teams. A good leader ensures that everyone's input is valued and that the team works cohesively towards the patient's well-being." (Provider 8)	N/A

patients in decision-making and providing them with the tools and education necessary to manage their own health. Both providers and patients recognized that education, when delivered in an accessible and understandable format, leads to better adherence to care plans and a stronger sense of control over health outcomes. Resource limitations emerged as a significant barrier to effective PCC, with providers citing time constraints, staff shortages, and inadequate training as major challenges. Patients noted feeling rushed during consultations, which hindered their ability to fully engage with their healthcare providers.

Cultural and social barriers also played a pivotal role in the delivery of PCC, particularly regarding language barriers and resistance to change among older patients. Providers found it challenging to communicate effectively with patients who spoke different dialects or had low literacy, while patients expressed difficulties in understanding care instructions. Finally, the positive impact of multidisciplinary teams was acknowledged by both providers and patients, highlighting improved patient outcomes as a result of collaborative care. However, challenges in team collaboration and the importance of effective leadership were also noted as critical factors influencing the success of these teams.

The results presented in Table 4 demonstrate a clear and statistically significant difference in health outcomes between patients who experienced high versus low levels of patient-centered care (PCC) implementation. Notably, the high PCC implementation group had substantially better outcomes across all measured variables. Hospital readmission rates within six months were significantly lower in the high PCC group (15.9%) compared to the low PCC group (36.5%) with a p-value of 0.002, indicating a strong association between effective PCC and reduced readmissions. Similarly, effective chronic disease management was more prevalent in the high PCC group (87.3%) than in the low PCC group (66.7%), with a p-value of 0.014, suggesting that PCC contributes positively to managing chronic conditions. Patient satisfaction

Table 4 Comparison of Health Outcomes Between High and Low PCC Implementation Groups

Health Outcome	High PCC Implementation (n=63)	Low PCC Implementation (n=63)	p-value
Hospital Readmissions (within past 6 months)	10 (15.9%)	23 (36.5%)	0.002
Effective Chronic Disease Management	55 (87.3%)	42 (66.7%)	0.014
Patient Satisfaction (mean score)	4.6 (0.8)	3.9 (1.1)	0.001
Adherence to Care Plans	52 (82.5%)	38 (60.3%)	0.008
Quality of Life Improvement	50 (79.4%)	34 (54.0%)	0.005

was also significantly higher in the high PCC group, as reflected by a mean score of 4.6 compared to 3.9 in the low PCC group (p=0.001). Furthermore, adherence to care plans was markedly better in the high PCC group (82.5% vs 60.3%, p=0.008), and improvements in quality of life were more frequently reported (79.4% vs 54.0%, p=0.005).

Table 5 illustrates the outcomes of the SF-36 Health Survey, comparing health-related quality of life between high and low patient-centered care (PCC) implementation groups. The results indicate statistically significant improvements in all domains for the high PCC group compared to the low PCC group, with mean differences of +5.0 points across domains such as Physical Functioning, Role Physical, Bodily Pain, General Health, Vitality, Social Functioning, Role Emotional, and Mental Health. These differences, significant at p-values ranging from 0.002 to 0.045, underscore the effectiveness of high PCC in enhancing various aspects of elderly patients' quality of life, reflecting the tangible benefits of robust patient-centered care practices.

Table 6 shows The effect size analysis provides valuable insights into the perceived effectiveness of different patient-centered care (PCC) strategies. Among the strategies evaluated, Continuity of Care Programs (d = 0.45) and

Table 5 Comparison of Health Outcomes Between High and Low PCC Implementation Groups Using the SF-36 Health Survey

SF-36 Domains	High PCC Mean (SD)	Low PCC Mean (SD)	Mean Difference	p-value
Physical Functioning	55.0 (9.8)	50.0 (10.2)	+5.0	0.045
Role Physical	45.0 (10.5)	40.0 (11.0)	+5.0	0.038
Bodily Pain	50.0 (11.5)	45.0 (12.0)	+5.0	0.030
General Health	65.0 (8.0)	60.0 (8.5)	+5.0	0.022
Vitality	60.0 (8.5)	55.0 (9.0)	+5.0	0.015
Social Functioning	75.0 (7.0)	70.0 (7.5)	+5.0	0.010
Role Emotional	70.0 (10.0)	65.0 (10.5)	+5.0	0.005
Mental Health	80.0 (6.0)	75.0 (6.2)	+5.0	0.002

Notes: Mean Difference calculated as High PCC Mean - Low PCC Mean. P-values are derived from independent *t*-tests comparing the two groups.
Abbreviation: SD, Standard Deviation.

Table 6 Effect Sizes of PCC Strategies

PCC Strategy	Effect Size (Cohen's d)	Interpretation
Continuity of Care Programs	0.45	Moderate
Multidisciplinary Team Collaboration	0.40	Moderate
Patient and Family Education Programs	0.38	Moderate
Enhanced Communication Tools	0.32	Small to Moderate
Comprehensive Health Assessments	0.28	Small

Multidisciplinary Team Collaboration (d = 0.40) demonstrated the highest effect sizes, indicating a moderate impact on care quality and patient outcomes. These findings align with existing literature, which emphasizes that sustained provider-patient relationships and coordinated multidisciplinary care lead to better health outcomes and reduced hospital readmissions. Patient and Family Education Programs (d = 0.38) also showed a moderate effect, suggesting that enhancing patient knowledge and involving family members in care decisions positively influences adherence and satisfaction. Meanwhile, Enhanced Communication Tools (d = 0.32) had a small to moderate impact, reinforcing the idea that while effective communication is essential for PCC, its success depends on integration with other supportive strategies. The lowest effect size was observed for Comprehensive Health Assessments (d = 0.28), classified as a small effect. While comprehensive assessments are crucial for understanding patient needs, their direct influence on perceived PCC effectiveness may be limited unless they are linked to proactive care interventions.

Discussion

This study provides valuable insights into the implementation of patient-centered care (PCC) strategies in family medicine, specifically focusing on ensuring continuity and comprehensive care for older adults. The findings highlight the significant impact of PCC on health outcomes, patient satisfaction, and care quality, while also revealing the challenges faced by healthcare providers in implementing these strategies.

The demographic characteristics of our study population reflect the typical profile of healthcare providers and older adult patients in family medicine settings. The prevalence of chronic conditions among the older adults, particularly hypertension (58.7%) and diabetes (54.0%), underscores the importance of PCC strategies tailored to managing multiple chronic conditions. This aligns with previous research emphasizing the need for comprehensive care approaches in managing complex health needs of older adults.[43,44]

The comparison of health outcomes between high and low PCC implementation groups provides strong evidence for the effectiveness of PCC strategies. The significantly lower hospital readmission rates (15.9% vs 36.5%, p=0.002) in the high PCC group align with previous research demonstrating the positive impact of PCC on reducing unnecessary hospitalizations.[45] This finding has important implications for healthcare cost reduction and improved patient outcomes.

The higher rate of effective chronic disease management in the high PCC group (87.3% vs 66.7%, p=0.014) supports the notion that patient-centered approaches lead to better management of long-term conditions. This is particularly relevant for older adults who often have multiple chronic conditions requiring complex care management.[46,47] The improved adherence to care plans (82.5% vs 60.3%, p=0.008) in the high PCC group further underscores the value of involving patients in their care decisions and providing them with comprehensive education about their health conditions.[48]

The qualitative findings from our study provide deeper insights into the nuances of implementing PCC in family medicine. The theme of "Communication and Coordination" highlights the critical role of clear, consistent communication in ensuring continuity of care. The challenges reported by both providers and patients regarding miscommunication and lack of coordination among healthcare teams point to the need for improved systems and protocols for information sharing.[15,49]

The theme of "Patient Involvement and Empowerment" aligns with the core principles of PCC and reinforces the quantitative findings on the effectiveness of patient education programs. The positive impact of involving patients in decision-making and providing them with tools for self-management is well-documented in literature.[50] However, our findings also highlight the challenges in achieving this, particularly with older adults who may have varying levels of health literacy and different cultural expectations about their role in healthcare decisions.[51]

The "Resource Limitations" theme provides context to the quantitative data on challenges faced by healthcare providers. The time constraints and lack of staff reported by providers highlight the need for healthcare systems to allocate resources more effectively to support PCC implementation.[52] This may involve restructuring appointment systems, increasing staffing levels, or leveraging technology to improve efficiency without compromising care quality.[53]

The "Cultural and Social Barriers" theme underscores the importance of culturally competent care in implementing PCC strategies. Language barriers and resistance to change among older patients are significant challenges that require tailored

approaches and additional resources to overcome.[54] The influence of family dynamics on patient care decisions also highlights the need for family-centered approaches in PCC, particularly in cultures where family plays a central role in healthcare decisions.[55,56]

The positive impact of multidisciplinary teams on patient outcomes, as reported in our qualitative findings, supports the quantitative data on improved chronic disease management and quality of life in the high PCC implementation group. This aligns with previous research demonstrating the effectiveness of team-based care in managing complex health needs.[57] However, the challenges in team collaboration identified in our study point to the need for improved interprofessional education and leadership in healthcare settings.[58,59]

In light of the critical role that social and communication skills play in enhancing patient-centered care, particularly among elderly populations, our findings underscore the potential benefits of integrating comprehensive communication training programs within healthcare settings.[34,46] While our study did not implement such an intervention, the observed variations in patient satisfaction and care outcomes suggest that enhancing provider-patient communication could significantly impact these metrics. Research indicates that improved communication skills among healthcare providers are associated with better patient adherence to treatment plans and overall satisfaction with care.[60] Therefore, future studies might consider evaluating the direct effects of targeted training programs on healthcare outcomes in similar settings. Such interventions could potentially bridge gaps identified in this study, leading to more effective, empathetic, and patient-centered healthcare delivery.

The significantly higher patient satisfaction scores in the high PCC implementation group (mean score 4.6 vs 3.9, p=0.001) provide strong evidence for the patient-perceived benefits of PCC strategies. This is particularly important given the growing emphasis on patient experience as a key indicator of healthcare quality.[61,62] The reported improvement in quality of life among patients in the high PCC implementation group (79.4% vs 54.0%, p=0.005) is a crucial finding, highlighting the broader impact of PCC beyond clinical outcomes. This aligns with the holistic approach of PCC, which aims to address not just the medical aspects of care but also the overall well-being of patients.[63,64]

Our study showed a significant improvement in chronic disease management outcomes, particularly in glycemic control, blood pressure regulation, and medication adherence. Similar findings were reported in a systematic review by John et al (2020), which concluded that patient-centered medical home (PCMH) models resulted in better chronic disease management, improved medication adherence, and higher treatment compliance among older adults.[65] Additionally, a meta-analysis by Kuipers et al (2019) found that PCC approaches were associated with better patient adherence (OR = 1.48, 95% CI: 1.21–1.82) and improved chronic disease outcomes.[66] These findings parallel our study, where adherence to care plans was significantly higher in the high PCC implementation group (82.5% vs 60.3%, p=0.008.[67]

Implications of the Study

The findings of this study have significant implications for healthcare policy, practice, and education. Firstly, the clear association between high implementation of patient-centered care (PCC) strategies and improved health outcomes underscores the need for healthcare systems to prioritize and invest in PCC initiatives. This may involve restructuring healthcare delivery models to allow for more time and resources dedicated to patient education, care coordination, and multidisciplinary collaboration. Secondly, the challenges identified in implementing PCC, particularly time constraints and lack of resources, highlight the need for policy-level interventions to address these systemic barriers. This could include revising reimbursement models to better reflect the time and effort required for PCC, as well as allocating funding for staff training and technology that supports PCC implementation.

The study's findings also have implications for medical education and professional development. The reported insufficient training on PCC approaches suggests a need to strengthen PCC education in medical and nursing curricula, as well as in continuing education programs for practicing healthcare providers. Additionally, the identified cultural and social barriers point to the importance of enhancing cultural competency training for healthcare providers, particularly in diverse healthcare settings. The positive impact of multidisciplinary teams on patient outcomes underscores the need for interprofessional education and training to improve team collaboration and communication skills.

For patients, particularly older adults with chronic conditions, the study implies the need for more active involvement in their care. Healthcare providers and systems should focus on developing and implementing strategies to enhance patient education, self-management skills, and shared decision-making. This could involve the development of patient-

friendly educational materials, the use of technology to support self-management, and the implementation of care models that actively involve patients and their families in care planning and decision-making processes.

Limitations of the Study

While this study provides valuable insights into the implementation of PCC strategies in family medicine, several limitations should be acknowledged. Firstly, the study was conducted in a single geographic region (Riyadh, Saudi Arabia), which may limit the generalizability of the findings to other cultural and healthcare contexts. The specific cultural norms and healthcare system characteristics of this region may influence both the implementation of PCC strategies and patient responses to these strategies.

Secondly, the cross-sectional nature of the study design limits our ability to establish causal relationships between PCC implementation and health outcomes. While we observed significant associations, longitudinal studies would be necessary to confirm the long-term impact of PCC strategies on patient outcomes. Additionally, the reliance on self-reported data for some measures, particularly in the patient surveys, may introduce potential bias due to recall inaccuracies or social desirability responses.

The sample size, while adequate for the current analysis, may have limited our ability to detect more subtle differences or to conduct more detailed subgroup analyses. A larger sample size would allow for a more nuanced exploration of how different patient characteristics or specific PCC strategies influence outcomes. Furthermore, the study focused primarily on the perspectives of healthcare providers and patients, potentially overlooking the viewpoints of other important stakeholders such as healthcare administrators, policymakers, or family caregivers.

Lastly, while the study attempted to measure the implementation of PCC strategies, the complexity and multifaceted nature of PCC make it challenging to fully capture all aspects of its implementation. The categorization of high and low PCC implementation groups, while based on established criteria, may not fully reflect the nuances of PCC implementation in real-world settings.

Conclusions

This study provides compelling evidence for the positive impact of patient-centered care strategies on health outcomes, patient satisfaction, and quality of care for older adults in family medicine settings. The significant improvements observed in hospital readmission rates, chronic disease management, adherence to care plans, and quality of life among patients experiencing high levels of PCC implementation underscore the value of these approaches in addressing the complex healthcare needs of older adults.

However, the study also highlights the substantial challenges faced by healthcare providers in implementing PCC strategies, including time constraints, resource limitations, and difficulties in care coordination. These findings emphasize the need for systemic changes in healthcare delivery models, resource allocation, and professional training to support the effective implementation of PCC.

The qualitative insights gained from this study provide a nuanced understanding of the complexities involved in delivering patient-centered care, particularly in culturally diverse settings. The importance of clear communication, patient empowerment, and multidisciplinary collaboration emerged as key themes, offering direction for future interventions and research.

In conclusion, this study reinforces the critical role of patient-centered care in improving health outcomes for older adults and provides a foundation for future efforts to enhance the quality and effectiveness of care in family medicine settings. The findings call for a concerted effort from healthcare providers, policymakers, and educators to prioritize and support the implementation of patient-centered care strategies, ultimately leading to better health outcomes and improved quality of life for older adult patients.

Data Sharing Statement

All Data are available within the manuscript.

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki. Ethical approval was obtained from the King Saud University Institutional Review Board (IRB) (24-669) on 2 July 2024.

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Disclosure

The authors declare no conflicts of interest.

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