

# Referral Process Enhancement: Innovative Approaches and Best Practices

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## Abstract

**Objective:** This study aimed to enhance the efficiency of the referral system at the Sultan Qaboos Comprehensive Cancer Care and Research Centre (SQCCCRC) in Muscat, Oman by reducing the average time for new patients' acceptance and the delay between patient acceptance and their first appointment. **Methods:** A one-group pretest-posttest quasi-experimental project was conducted from Quarter 2 of 2022 to Quarter 2 of 2023. Data collected during the pretest and posttest phases were compared to evaluate the impact of interventions on the average days for patient acceptance and the time to first appointment after acceptance. The intervention involved developing a comprehensive referral system incorporating technology development, improved accessibility, orientation materials, internal training, policy formulation, criteria definition, and tailoring acceptance criteria to specialty programs. Awareness campaigns were also conducted to educate patients about the referral process and available transportation options. The project followed the FOCUS PDCA (Find, Organize, Clarify, Understand, Select, Plan, Do, Check, Act) approach for implementation. **Result:** Significant improvements were observed in the oncology referral process, with the average days for patient acceptance decreasing from 4.3 days to 1.3 days post-implementation. Statistical analysis confirmed the significance of this change (F-value = 46.25,  $p < .0001$ ). Similarly, the average days to first visit appointment after acceptance decreased from 8.6 days to 4.0 days, with statistical support (F-value = 6.29,  $p < .0$ ). **Conclusion:** This study represents a significant advancement in optimizing the oncology referral process. When considered in conjunction with previous research findings, it underscores the importance of ongoing efforts to enhance efficiency in patient referrals.

**Keywords:** Oncology Setting- FOCUS PDCA- Referral Process- SQCCCRC- Oman

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## Introduction

The World Health Organization (WHO) defines the referral process as a systematic procedure in which a healthcare provider at a certain level, when faced with limited resources or expertise, seeks assistance from a more specialized facility at the same or higher level to effectively manage a patient's case. In oncology, this process is particularly crucial due to the intricate nature of cancer treatment and the necessity for interdisciplinary collaboration [1].

Efficiency in a new patient referral system is of paramount importance for several reasons. Firstly, it plays a vital role in ensuring prompt access to specialized care, especially critical in fields like oncology where delays can significantly impact patient outcomes and

survival rates [2]. Secondly, an efficient referral system facilitates smooth transitions between healthcare providers and services, promoting continuity of care tailored to individual patient needs, which is essential for effectively managing chronic conditions and optimizing outcomes [2]. Additionally, such a system helps optimize resources within the healthcare system by directing patients to the most suitable providers and services, reducing unnecessary duplication of tests and treatments, thereby leading to cost savings and improved efficiency [3]. Moreover, it enhances patient satisfaction and experience by simplifying the referral process, minimizing confusion, and engaging patients in navigating the healthcare system more effectively, ultimately fostering trust and confidence in the healthcare delivery system [4].

Numerous studies have explored strategies aimed at

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optimizing cancer patient referral processes, focusing on technology, process standardization, system development, and patient involvement. Efforts in technology development have resulted in the creation of a comprehensive referral system addressing both external and internal dimensions, facilitating seamless communication between healthcare providers [5]. Improved accessibility through the dissemination of referral system links across various platforms enhances collaboration and expedites referrals [4]. Additionally, the development of informative and user-friendly orientation materials offers clear guidance on navigating the referral system, enhancing its usability [6]. Internal staff education initiatives are also crucial, ensuring that healthcare professionals are adept at utilizing the referral system effectively [7]. Standardizing the referral process ensures consistency and efficiency [8], including defining clear criteria for patient acceptance and streamlining decision-making processes [2].

Policy formulation is essential for guiding the acceptance process and ensuring transparency and consistency in referrals [9]. Defining specific criteria for patient acceptance based on various programs and specialties directs patients to the most appropriate care setting [3]. Tailoring acceptance criteria to specific specialty programs further enhances the efficiency and effectiveness of referrals. Patient involvement is fundamental in optimizing referral processes. Developing awareness campaigns to educate patients about the referral process and available transportation options engages them in navigating the healthcare system effectively [10].

FOCUS-PDCA (Find, Organize, Clarify, Understand, Select, Plan, Do, Check, Act) represents a pioneering approach to continuous quality improvement, initially introduced by American hospital organizations and rooted in the PDCA cycle. This model ingeniously combines the FOCUS methodology with the principles of continuous cycle improvement (PDCA), resulting in an enhanced management paradigm. Characterized by a hierarchical structure consisting of primary and secondary rings, incremental progress, and rigorous statistical analysis, FOCUS-PDCA finds wide-ranging applications in diverse domains, including patient care, pharmaceutical management, and medical record administration [11].

At the Sultan Qaboos Comprehensive Cancer Care and Research Centre (SQCCRC) in Muscat, Oman, there exist gaps in understanding the factors contributing to the prolonged duration of the new patient referral process. Specifically, the research problem centers around investigating the reasons behind the average time taken for patient acceptance (4.3 days). Simultaneously, the average interval between patient acceptance and the first visit appointment was found to be 8.6 days.

Therefore, the objective of this study was to enhance the efficiency and patient-centeredness of the referral system by reducing the average time for new patient acceptance and minimizing the delay between patient acceptance and the first appointment using the FOCUS-PDCA approach at the Sultan Qaboos Comprehensive Cancer Care and Research Centre (SQCCRC) in Muscat, Oman.

## Materials and Methods

### Setting

The research was conducted at the Sultan Qaboos Comprehensive Cancer Center in Muscat, Oman, from the third quarter of 2022 to the second quarter of 2023.

### Design

Utilizing a one-group pretest-posttest quasi-experimental design, the study aimed to assess the impact of implemented interventions (refer to Table 3) on key performance indicators within the oncology referral process before and after the intervention. This quasi-experimental design involved evaluating a sample group at two distinct time points: pretest and posttest, eliminating the need for a separate control group. By comparing data from these two phases, the study sought to determine the effectiveness of the interventions on the identified performance indicators [12].

The performance indicators included the average duration for patient acceptance and the time taken for the first visit appointment after acceptance for newly referred patients. Data for these indicators were collected by the Quality and Accreditation Department through an analysis of patient records in the Patient Flow Office. All newly referred patients during the project's quarters were included in the indicator calculation, thus no sampling techniques were employed.

### FOCUS PDCA approach

The project implementation followed the FOCUS-PDCA approach, a structured methodology that combines "Find, Organize, Clarify, Understand, and Select" in the FOCUS phase with "Plan, Do, Check, and Act" in the PDCA cycle. This systematic framework provided guidance for driving the project's progress and ensuring its success (Table 1) [11].

### Finding and Selecting Critical Areas for Improvement (Find Phase)

The project focused on identifying significant areas for improvement within discharge plans, specifically targeting key performance indicators. The pre-data assessment included two crucial indicators: the average time for new patient acceptance, which was 4.3 days, and the average duration for newly accepted patients to consult with the medical team, which was 8.6 days.

### Organizing the Team (Organize Phase)

A collaborative team consisting of experts from various departments, including the Admission Discharge Transfer Office, nursing, quality and accreditation, informatics and cybersecurity, and physicians, was assembled to execute the project.

### Clarifying the Situation (Clarify Phase)

The project team created a flow chart illustrating the current referral process (Figure 1). The process begins with the patient presenting their medical reports at the center. Subsequently, patient registration can be initiated through two pathways: facilitated by the Clinical Nurse

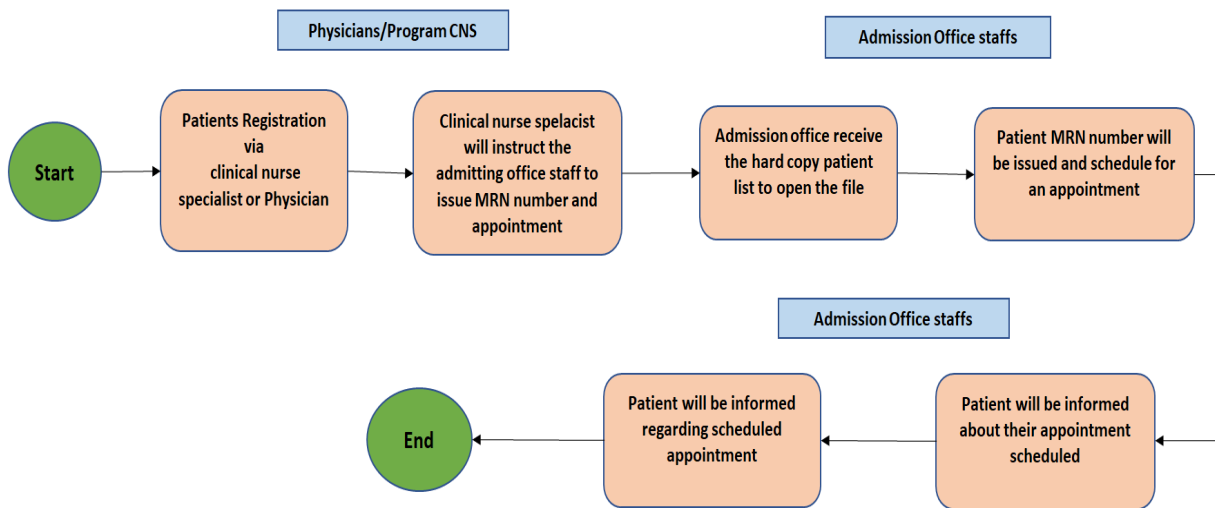


Figure 1. Previous Practice for New Patient Referral Appointment

Specialist (CNS) or directly with a Physician. If the CNS is involved, they communicate with the Admission Office staff to guide them on the patient’s registration. Following this, the Admission Office staff assigns a unique Medical Record Number (MRN) to the patient and schedules an appointment simultaneously. The MRN serves as the patient’s distinct medical identity within the center’s records. The patient receives both an MRN and an appointment for a specific date and time, ensuring a structured flow from initial entry to registration, MRN issuance, and appointment scheduling, with effective coordination among all involved parties. Subsequently, barriers in the current referral process were identified (Table 2).

*Understanding the Root Causes (Understand Phase)*

To comprehensively understand the root causes behind the challenges encountered in the referral process, the “Understand Phase” was initiated. A systematic approach was employed, utilizing the Fishbone (Ishikawa) diagram tool as a central method to identify underlying causes contributing to the identified issues through brainstorming techniques (Figure 2).

*Selecting Areas of Improvement (Select phase)*

Areas of improvement were selected based on

previous steps and available studies (13-22). These areas included technology development and enhancement, process modification, system modification, and patient involvement (Table 3).

*PDCA Cycle*

Subsequently, operational plans were developed by the project team and relevant stakeholders with full support from leadership (Table 3). The implementation of PDCA cycles occurred from the fourth quarter of 2022 to the second quarter of 2023. Monthly follow-ups, checks, and discussion meetings were conducted by analyzing indicators to assess improvements during plan implementation. Education on new plans and follow-ups were conducted to enhance processes and maintain achievements.

*Process Modification*

A new process was established to address previous barriers (Figure 3). Referrals are initiated through a provided link, facilitated by external healthcare facilities. The referral journey continues as the admission office coordinates the seamless transfer of the referral to the appropriate program, aligning with the relevant healthcare team. The designated program team then conducts a comprehensive assessment of the patient’s unique needs,

Table 1. FOCUS PDCA Approach Description

Phase	Description
Find	Identifying critical areas for improvement in the organization
Organize	Organizing the quality improvement team
Clarify	Clarifying the current process to understand the barriers and risk factors
Understand	Identifying the root causes that leads to improper outcomes
Select	Selecting areas of improvement within the process to improve the current outcome
Plan	Developing the SMART operational plans for improvement based on the areas of improvement within the process
Do	Implementing the plans
Check	Checking the improvement using the key performance indicators
Act	Maintaining the achievement and making informed adjustments based on the evaluation findings

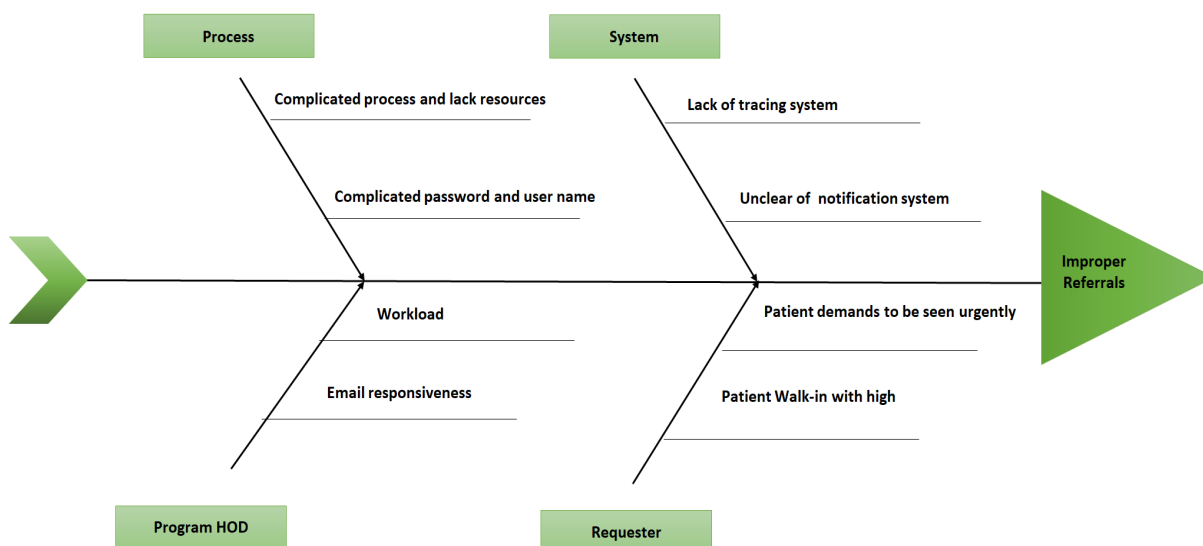


Figure 2. Cause- Effect Analysis for Improper Referrals Appointments for New Patients

determining the most suitable course of action.

A continuous feedback loop is crucial in this process, enabling the communication of essential information. This feedback mechanism ensures that the referral’s progress and assessment outcomes are conveyed back to the admission office through a robust system, promoting ongoing exchange of vital details and efficient coordination.

Once the assessment is complete, the insights obtained are promptly communicated not only to the initiator of the referral but also to the patient. This transparent communication ensures that all relevant parties are well-informed about the status and progress of the referral process. In cases where patients present their referral documents in physical form, the system accommodates their inclusion by digitizing and integrating these

materials. This digitization process ensures consistency and uniformity, aligning these cases with the established digital referral process. Ultimately, the admission office plays a pivotal role in processing referral documents, regardless of their format, ensuring that the steps taken for processing referrals in paper format mirror those undertaken for their digital counterparts, maintaining cohesion and effectiveness throughout the entire referral process.

*Developing the New Referral Tracing System*

The implementation of the “Referral Tracing System” action represents a significant leap towards improving the efficiency of the referral process in healthcare. This multifaceted initiative integrates various strategies, including technological advancements and strategic

Table 2. Barriers in the Current Process of Referral Process

Areas	Barriers
Email Issues	Delayed replies Complicated user names and passwords
Patient Reports	Handling physical documents Potential loss or misplacement of hardcopy documents Unclear or illegible documents Slow scanning process Large volume of documents from patients Sharing of scanning equipment with others Staff using personal devices for document scanning
Incomplete Document to Process Referral	Documents missing critical information Inadequate documentation to complete the referral process
Sending Email to Head of Department	Difficulty in tracking sent emails Challenges in identifying the appropriate recipient Pending decisions or responses due to communication delays or coordination issues Staff using personal devices for document scanning Documents missing critical information

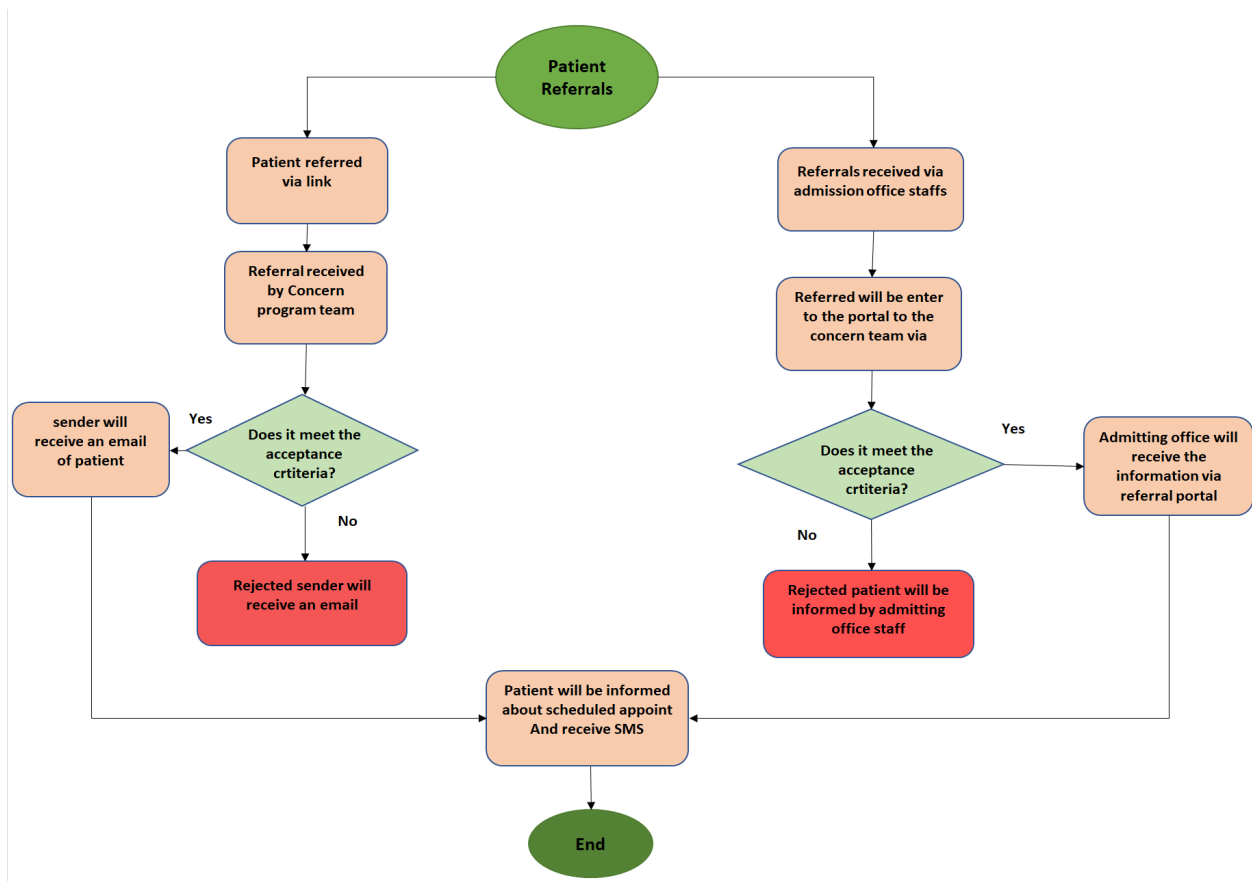


Figure 3. New Process for New Patient Referral Appointment

enhancements, to facilitate seamless referral exchanges between healthcare entities. Central to this effort is the establishment of a comprehensive referral system, leveraging advanced technology to serve as a centralized hub for managing referrals both externally and internally. Through strategic dissemination of referral system links and educational materials, the action ensures accessibility and provides guidance for users navigating the system.

Moreover, comprehensive training initiatives empower internal staff to effectively manage incoming referrals, contributing to a cohesive acceptance process within the organization. By prioritizing technology, accessibility, and staff empowerment, the “Referral Tracing System” underscores the organization’s commitment to streamlining referrals, promoting collaboration, and ultimately enhancing patient care outcomes.

Table 3. Improvement Areas and Operational Plans for the Quality Improvement

Main Area of Improvement	Plans
Technology	<ol style="list-style-type: none"> <li>1. Technology Development: Creation of a comprehensive referral system addressing both external (referred organization) and internal (acceptance process) dimensions.</li> <li>2. Enhanced Accessibility: Publishing the referral system link across all relevant facilities and organization websites, ensuring convenient access for external parties.</li> <li>3. Orientation Materials: Development of informative and user-friendly orientation materials on the organization's website, providing clear guidance on navigating the referral system.</li> <li>4. Internal Training: Implementation of internal staff education initiatives to effectively educate and empower team members about utilizing the referral system adeptly.</li> </ol>
Process	Standardize the process of referral (internal and external process) Figure 3
System and policy management	<ol style="list-style-type: none"> <li>1. Policy Formulation: Develop a comprehensive referral policy that outlines the objectives, scope, and principles guiding the acceptance process for patients.</li> <li>2. Criteria Definition: Define clear and specific criteria for patient acceptance based on the various programs and specialties offered. These criteria could include medical condition severity, treatment availability, and program suitability.</li> <li>3. Specialty Programs Criteria: Tailor the criteria for acceptance to the specific specialty programs available. Different programs may have unique requirements, ensuring that patients are directed to the most appropriate care setting.</li> </ol>
Patient involvement	Develop awareness campaigns to educate patients about the referral process, including transportation options available to them.

Table 4. Impact of Intervention on Patient Acceptance and First Appointment Scheduling Times Pretest and Post Test

		Month	Mean	F	p value
Average number of days for the acceptance of new patients	Pre-data	22-Jul	4.3	46.25	<0.0001
	Post intervention	22-Oct	1.3		
		22-Nov	1.3		
		22-Dec	1.6		
		23-Jan	1.6		
		23-Feb	1.4		
		23-Mar	1.3		
Average days between the patient acceptance and first visit appointment	Pre-data	22-Sep	8.6	6.29	0.002
	Post intervention	22-Oct	6.4		
		22-Nov	6.9		
		22-Dec	7		
		23-Jan	5		
		23-Feb	4		
		23-Mar	4		

### *Policies and Acceptance and Rejection Criteria*

The initiative focused on improving the referral process through policy development centered on creating a standardized and transparent framework for referral acceptance and rejection. This comprehensive policy, governing both internal and external aspects, established clear guidelines ensuring fairness and consistency. By fostering communication and collaboration among stakeholders, the policy facilitated seamless information exchange between referring organizations and healthcare teams. Additionally, streamlining the referral process involved refining acceptance and rejection criteria, ensuring equitable treatment for referred patients. These well-defined parameters, considering factors like medical condition severity and treatment availability, guided decision-making to enhance patient care quality and resource allocation. The integration of policy development with criteria refinement reflected the organization's dedication to fairness, consistency, and patient-centered care throughout the referral process.

### *Data Analysis*

SPSS version 23 was utilized for data analysis. The average mean was employed to assess pre- and post-intervention data. ANOVA and p-values were calculated to determine differences in results and evaluate the effectiveness of the intervention.

### *Ethical Considerations*

This study underwent a comprehensive review and received approval from the Institutional Review Board at the Center. The researchers obtained ethical approval, including an assigned approval number, to ensure adherence to ethical guidelines.

## **Results**

The results of the intervention study reveal a significant reduction in the average number of days for new patient acceptance and the average days between patient

acceptance and the first visit appointment.

Regarding the average number of days for new patient acceptance, the pre-intervention data collected in July 2022 indicated an average of 4.3 days. Following the intervention, there was a notable decrease in the time taken to accept new patients, with averages ranging from 1.3 to 1.6 days between October 2022 and March 2023. The most substantial reduction occurred immediately after the intervention in October 2022, with the average number of days decreasing to 1.3. This improvement was sustained in the subsequent months, confirming a consistent enhancement. Statistical analysis validated this change, yielding an F-value of 46.25 and a p-value of less than .0001, signifying a highly significant impact on reducing waiting times for new patient acceptance.

Similarly, there was a significant improvement in the average days between patient acceptance and the first visit appointment post-intervention. The pre-intervention data collected in September 2022 showed an average of 8.6 days. Following the intervention in October 2022, this time decreased to 6.4 days and continued to improve in subsequent months, reaching as low as 4 days in February and March 2023. The reduction to 5 days in January 2023 and the sustained 4-day timeframe in the last two months underscored the effectiveness of the intervention. Statistical analysis supported these findings, indicating an F-value of 6.29 and a p-value of less than .0, demonstrating statistical significance (Table 4).

## **Discussion**

The planned technical developments and procedural improvements in the referral system represent a significant advancement in enhancing healthcare services. A comparison of these strategies with previous research reveals a deliberate effort to address significant challenges and streamline the patient referral process, offering benefits to both patients and healthcare professionals [10, 13, 14].

In contrast to prior studies, the current methodology

places a strong emphasis on technological advancement. The creation of a comprehensive referral system that encompasses both external and internal components is a novel approach. Previous research often focused solely on either external or internal aspects of referrals, leading to disjointed systems. The proposed solution aims to provide a seamless experience for all stakeholders by integrating both dimensions.

The utilization of facility and organization websites to share the referral system URL represents a notable enhancement. This ensures improved accessibility for external parties and demonstrates an acknowledgment of the contemporary digital landscape in which we operate. This aligns with trends in the digitalization of healthcare and the empowerment of patients through online resources [9, 10, 15, 16]. The development of informative and user-friendly orientation materials is a significant improvement. This approach acknowledges that external entities may lack familiarity with the intricacies of the referral system, and providing clear instructions helps reduce misunderstandings and inefficiencies. Furthermore, the implementation of internal staff education initiatives signals a shift towards comprehensive training [12, 14, 17].

Previous studies may have overlooked the importance of adequately training healthcare personnel in utilizing the referral system. This internal training aligns with research indicating that the successful adoption of technical solutions hinges on the proficiency of employees [10, 18, 19]. The emphasis on standardizing the referral process, both internally and externally, indicates a departure from past practices that relied on inconsistent and unpredictable methods. The proposed strategy aims to enhance referral efficiency by implementing standardized procedures, which can reduce errors, minimize delays, and improve overall effectiveness. This mirrors the quality improvement strategies frequently recommended in healthcare literature, with the objective of optimizing patient care pathways [20, 3, 9].

The implementation of a comprehensive referral strategy signifies a departure from previous research that may have lacked a structured policy framework. This policy serves to establish clear goals and ensure a shared understanding among all stakeholders involved. Another notable advancement is the establishment of precise and explicit standards for patient acceptance. This approach acknowledges the diverse range of medical conditions and specialties, ensuring that referrals are directed to the most appropriate care settings [13, 15, 21, 22]. Previous studies may have relied on broad recommendations, potentially leading to referrals being directed to inappropriate recipients [9]. Customizing admission criteria to align with the specific specialty programs offered is an innovative consideration. This reflects a deep understanding of the complexities inherent in healthcare services. The proposed approach recognizes that different specialties have unique requirements, contrasting with prior research that may have treated all referrals uniformly. Implementing this customized strategy is expected to result in more accurate and efficient referrals, in line with the principles of patient-centered care [3, 5, 12]. Conducting awareness

campaigns to educate patients about the referral process, including transportation options, demonstrates a proactive approach to engaging patients. Previous research may have assumed that patients are already familiar with the process, potentially leading to confusion and delays. By providing patients with information, this strategy aligns with the growing trend of patient empowerment and shared decision-making [3, 16, 22].

The study encountered several limitations and challenges that require acknowledgment. Primarily, its reliance on a one-group pretest-posttest quasi-experimental design limited the ability to establish causal relationships due to the absence of a control group and the potential influence of confounding variables. Additionally, the study's duration spanning four quarters may not have been sufficient to capture the long-term effects of the interventions. Despite efforts to standardize the referral process, variations in patient characteristics and healthcare provider practices may have influenced outcomes. The interventions, which encompassed technology development, policy formulation, and staff training, were multifaceted, making it challenging to pinpoint specific effects on referral process outcomes. Practical challenges, such as stakeholder engagement and resource availability, further complicated the implementation process. Moreover, cultural and contextual factors unique to Oman's healthcare setting could have impacted intervention effectiveness and generalizability. Addressing these limitations is essential for future research to enhance referral system efficiency and patient-centeredness in healthcare. In conclusion, while this study represents a significant advancement in improving the oncology referral process, its efficiency is bolstered when considered in conjunction with insights from prior research. By leveraging existing knowledge and implementing effective interventions, healthcare institutions can continue to enhance patient care and streamline referral processes to enhance healthcare quality and delivery.

## Author Contribution Statement

Mansour AL-Moundhr, Khalid Albamani: supervision of the whole steps of project; Shinnona Hamed AlHarthy, Wisal Al-Mahmoodi, Omar Ayaad, Rawan Ibrahim: Implementing the FOCUS PDCA approach and interventions; Omar Ayaad, Rawan Ibrahim, Khalid Albamani: Preparing manuscripts.

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## Scientific Approval

The study proposal underwent review and approval by the research office at the Sultan Qaboos Comprehensive Cancer Care and Research Centre (SQCCRC) in Muscat,

Oman.

### Ethical Declaration

Institutional Review Board (IRB) approval was obtained from the research office at the Sultan Qaboos Comprehensive Cancer Care and Research Centre (SQCCRC) in Muscat, Oman to conduct the study.

### Conflict of Interest

The authors have no conflicts of interest to disclose.

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