Short Communication

Providing Primary Health Care for Non-communicable Disease Patients During Pandemics: A Qualitative Study

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ABSTRACT

The COVID-19 pandemic severely disrupted primary health care (PHC) for noncommunicable diseases (NCDs), causing delayed care and higher mortality globally. In Iran, over 5 million NCD patients are registered in the integrated health system (SIB), yet PHC utilization dropped sharply. This study aimed to examine challenges in PHC-based NCD care during the crisis and strategies for future emergencies. In 2021, a qualitative study was conducted using conventional content analysis. Semi-structured interviews were conducted with 11 experienced NCD program managers from Iranian universities of medical sciences and the Ministry of Health, selected via purposive sampling. Data collection continued until thematic saturation. Transcripts were analyzed using Graneheim and Lundman's thematic content analysis in MAXQDA software, version 10. Trustworthiness was ensured through prolonged engagement, member checking, and peer debriefing. Thematic analysis revealed two overarching domains: challenges and strategies. Challenges were categorized into provider-related issues at the macrolevel (policy neglect, workforce reallocation, fragmented command, inadequate digital infrastructure) and microlevel (non-free services, prolonged follow-ups, equipment shortages, low motivation), alongside recipient-related factors (fear of infection, unhealthy lifestyle changes, psychological distress). Proposed strategies included fundamental transformation (dedicated NCD clinics, telemedicine, home-based care, strengthened self-care) and optimization of existing processes (private-sector collaboration, risk-stratified follow-up, task shifting, enhanced insurance coverage, proactive crisis planning).

Keywords: Primary health care, Noncommunicable diseases, COVID-19 pandemic, Qualitative research, Iran

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Introduction

Non-communicable diseases (NCDs), including cardiovascular diseases, diabetes, chronic respiratory conditions, and cancers, are the leading causes of death globally, accounting for 71% of all deaths worldwide in 2016 [1]. In Iran, the burden is particularly severe, with NCDs responsible for 82% of all deaths and approximately 15% of premature mortality, underscoring their status as a major public health priority [2].

Primary healthcare (PHC) is the cornerstone of effective, equitable, and sustainable health systems. By providing continuous, comprehensive, and community-based services, PHC not only improves population health outcomes but also reduces costs and mitigates health inequities [3]. Recognizing this, the World Health Organization (WHO) has positioned PHC as central to achieving universal health coverage [4]. During the COVID-19 pandemic, PHC systems played a dual role: delivering essential preventive and chronic care while simultaneously supporting pandemic response through case detection, contact tracing, and community-based isolation [5].

However, the pandemic severely disrupted routine NCD services worldwide. In many countries, including Iran, PHC resources were redirected toward acute pandemic management, leading to delayed diagnoses, interrupted treatment, and worsening disease control among NCD patients [6, 7]. In the national integrated health system (SIB), over 5 million individuals with hypertension and diabetes are registered for routine follow-up at comprehensive health centers and health posts. However, during the pandemic, SIB data revealed a sharp decline in service utilization: blood pressure monitoring visits dropped by 52%, and diabetes care visits decreased by 28% [7].

Globally, studies have documented systemic weaknesses in PHC delivery for NCDs during health emergencies. In Bangladesh, "NCD corners" at primary facilities remain underdeveloped and lack capacity for comprehensive care [8]. Similar gaps have been reported in Nepal, Ghana, Zimbabwe, and Iran, where fragmented infrastructure, workforce shortages, and weak integration of chronic care into emergency planning persist [9-11].

The WHO has urged countries to "build back better" by embedding NCD preparedness into national pandemic response frameworks and strengthening PHC as the foundation of resilient health systems. Despite this call, a critical evidence gap remains—particularly in middle-income settings, such as Iran—regarding the specific challenges and context-appropriate solutions for maintaining NCD care during pandemics [7].

Therefore, this qualitative study aimed to explore the perspectives of experienced NCD program managers on the challenges faced in delivering PHC services to NCD patients during the COVID-19 pandemic and to identify feasible, actionable strategies to enhance system resilience in future public health emergencies.

Given that the service delivery system for NCDs is not significantly different from the pandemic, and the method of providing services, workforce organization, available resources, the data registry and the control system are now exactly the same as in 2021. Also, crises, such as COVID 19, can threaten the country's health system at any time. The results of this study can be applied to prevent disruptions in providing services to patients in similar crises.

Methods

This qualitative study was conducted in 2021—approximately two years after the onset of the COVID-19 pandemic in Iran—to explore the challenges and potential solutions to delivering PHC services to patients with NCDs during the pandemic.

We employed a conventional qualitative content analysis approach based on the framework proposed by Graneheim and Lundman. This method is particularly suited for exploring complex phenomena in real-world contexts through in-depth interpretation of participants' experiences and perspectives [12].

Participants were selected using purposive sampling to include individuals with rich, relevant experience in NCD management at the PHC level [13]. The inclusion criteria were:

1) Current managerial or executive role in NCD programs within universities of medical sciences or the Ministry of Health and Medical Education; 2) In-depth knowledge of Iran's PHC system and NCD care pathways; 3) Minimum of three years of professional experience in NCD prevention and control.

Participants who were unwilling to continue were excluded from the study. Data collection continued until thematic saturation was achieved—defined as the point at which no new codes or categories emerged from consecutive interviews. A total of 11 participants were interviewed.

Semi-structured, in-depth interviews were conducted either face-to-face or via telephone/video call, depending on participants' availability and pandemic-related restrictions. The first author conducted all interviews, drawing on extensive training in qualitative interviewing techniques.

Prior to each interview, the study's purpose was explained, and verbal informed consent was obtained. Participants were assured of confidentiality and anonymity, and were informed that their participation would not affect their professional status.

The research team developed an interview guide based on the study objectives and a comprehensive review of literature on health system resilience and PHC functions during emergencies. The team pilot-tested the guide with two experts (not included in the final sample). Core questions included:

1) "In your opinion, was the provision of NCD care during the COVID-19 pandemic appropriate? Why or why not?" 2) "what challenges did PHC centers face in delivering NCD services during the pandemic?" 3) "what strategies would you recommend to maintain or improve NCD care during future public health emergencies?"

Each interview lasted between 35 to 55 minutes, was audio-recorded with permission, and supplemented with field notes. Interviews were transcribed verbatim in Persian immediately after completion.

Transcripts were imported into MAXQDA software, version 10 for systematic coding and analysis. Following Graneheim and Lundman's five-step process:

1) Transcripts were read repeatedly to gain a holistic understanding; 2) Meaning units (relevant phrases or sentences) were identified; 3) Meaning units were condensed and labeled with initial codes; 4) Similar codes were grouped into subcategories and then into broader categories; 5) Underlying themes were abstracted to form the final analytical structure [12].

To enhance trustworthiness, we applied Lincoln and Guba's criteria:

1) Credibility: Achieved through prolonged engagement, member checking (participants reviewed preliminary codes for accuracy), and peer debriefing with two external qualitative-research experts. 2) Dependability: Maintained via an audit trail documenting all analytical decisions. 3) Confirmability: Ensured by reflexivity (researchers acknowledged their positions and potential biases) and triangulation of data sources (interviews + field notes) [14].

Results

Thematic analysis of the interviews with 11 NCD program managers revealed two overarching domains: (1) challenges in delivering PHC services to NCD patients during the pandemic, and (2) proposed strategies to strengthen service continuity in future health emergencies. The challenges were further categorized into those related to service providers and service recipients.

A. Challenges in noncommunicable diseases service delivery

A-1. Service provider–related challenges

Participants identified systemic and operational barriers at both macro (system-level) and micro (facility-level) layers of the PHC system.

Macro-level challenges included:

1) Policy neglect of NCDs: During the pandemic, national and provincial priorities shifted overwhelmingly toward infectious disease control, marginalizing NCD care.

"NCDs should be addressed more, and pandemics make the situation worse" (Participant [P]. 8).

2) Workforce reallocation: Multi-professional PHC staff were diverted to COVID-19 screening, vaccination, and case tracing, leaving insufficient human resources for NCD follow-up.

3) Fragmented command structure: Lack of unified leadership across health sectors led to inconsistent guidelines and delayed decision-making.

4) Inadequate digital infrastructure: Limited investment in telehealth and electronic health records hindered remote service delivery.

Micro-level challenges emerged at the point of care:

1) Non-free services: Many NCD-related tests and medications were not fully covered by insurance, deterring patients from seeking care.

2) Prolonged follow-up intervals: Ministry guidelines extended routine visit intervals (e.g. from 3 to 6 months), compromising disease control.

"The length of our care period has increased… the patient had to visit six months later instead of three months later" (P. 7).

3) Equipment shortages: PHC centers lacked essential devices (e.g. glucometers, blood pressure monitors).

4) Low staff motivation: Overburdened personnel reported burnout and reduced morale due to pandemic-related stress and unclear roles.

A-2. Service recipient–related challenges

Participants emphasized that patient behavior was profoundly shaped by the psychosocial context of the pandemic:

1) Fear of infection: Many patients avoided health centers due to concerns about contracting COVID-19. "People's fear… they had no clear future of this disease and did not have any specific information" (P. 5).

2) Unhealthy lifestyle changes: Lockdowns led to physical inactivity, poor nutrition, weight gain, and increased tobacco use. "Their physical mobility… became less, their nutrition became more inappropriate… overweight and obesity have been added… affecting cardiovascular diseases, diabetes, and blood pressure" (P. 11).

3) Psychological distress: Elevated levels of stress, anxiety, and depression negatively impacted treatment adherence and self-care.

(Note: Table 2 referenced in the original manuscript was not provided; if it contains illustrative quotes or thematic mapping, it should be reconstructed and inserted here.)

B. Proposed strategies for resilient noncommunicable diseases care

Participants proposed two complementary pathways to enhance PHC responsiveness during future pandemics.

B-1. Fundamental transformation of service delivery

This approach entails structural innovations that depart from traditional models:

1) Dedicated NCD clinics: Establishing separate, low-risk centers exclusively for NCD patients to reduce infection exposure. "Let's consider some centers where corona patients do not travel a lot… so people can get rid of their fear and come" (P. 4).

2) Telemedicine and digital health: Expanding remote consultations via phone, messaging apps, or integrated platforms (e.g. SIB).

3) Home-based care: Providing in-home monitoring and support for high-risk or mobility-limited patients.

4) Strengthened self-care: Empowering families with knowledge and tools to manage chronic conditions. "The family of a person with an NCD should have enough information… so relatives can provide these services if we lack access" (P. 6).

B-2. Optimization of existing processes

This pathway focuses on refining current systems for greater efficiency and equity:

1) Private-sector collaboration: Integrating data from private clinics to monitor patient outcomes and ensure continuity. "If our patients go to the private sector, we can use their data to see if they are really under control." (Participant 1)

2) Risk-stratified follow-up: Prioritizing high-need patients (e.g. those with comorbid diabetes and hypertension) for shorter visit intervals.

3) Task shifting and team-based care: Redistributing responsibilities among health workers and community volunteers.

4) Enhanced insurance coverage: Expanding financial protection for NCD diagnostics and medications.

5) Proactive crisis planning: Developing pre-approved protocols for NCD care during emergencies. "Before the crisis, we should have relevant instructions and really use previous experiences" (P. 6); "The health system should anticipate these conditions… and improve itself based on such crises" (P. 11).

Discussion

This qualitative study explored the challenges and potential solutions for delivering PHC services to patients with NCDs during the COVID-19 pandemic in Iran, based on the perspectives of experienced NCD program managers. Our findings reveal that the pandemic not only exposed pre-existing vulnerabilities in Iran's PHC system but also triggered a cascade of operational, systemic,

and behavioral disruptions that collectively undermined continuity of care for millions of NCD patients. These insights align with—and extend—global evidence on health system fragility during public health emergencies.

Policy neglect and the "invisible crisis" of non-communicable diseases

A central finding was the systemic reprioritization of NCDs at the macro level during the pandemic. As resources and political attention shifted overwhelmingly toward infectious disease control, chronic care was relegated to a secondary status—a phenomenon described globally as the "invisible crisis" of NCDs during emergencies [6, 15-19]. This short-term focus on acute mortality, while understandable, carries long-term consequences: delayed diagnosis, poor disease control, and increased risk of complications and premature death [16, 19]. Our participants emphasized that this neglect was not merely logistical but structural, rooted in a health system historically oriented toward episodic, hospital-based care rather than sustained, community-based chronic disease management.

This finding resonates with Kraef et al.'s analysis in sub-Saharan Africa, where the pandemic exacerbated workforce shortages and fragmented NCD service delivery due to the reallocation of multi-professional PHC teams to pandemic response [20]. In Iran, a similar dynamic occurred: despite a nationwide PHC network and the SIB electronic platform, the lack of dedicated NCD cadres meant generalist staff were diverted from chronic care duties, leaving critical gaps in follow-up and monitoring.

Operational disruptions at the point of care

At the micro level, our study identified prolonged follow-up intervals, inadequate equipment, and non-free services as key barriers. The Ministry of Health and Medical Education's decision to extend routine visit intervals (e.g. from 3 to 6 months) was intended to reduce crowding. However, this inadvertently compromised disease control—particularly in high-risk patients with diabetes or hypertension. This echoes Thakur et al.'s observation that pandemic-related service postponements led to significant delays in NCD care across low- and middle-income countries [21].

Moreover, financial barriers persisted despite Iran's near-universal health insurance coverage. Many diagnostic tests and NCD medications remain partially out-of-pocket, deterring vulnerable populations from seeking timely care—a challenge also reported in Nepal and Ghana [9, 22]. This underscores the need for explicit financial protection mechanisms for NCD services during crises.

Behavioral and psychosocial dimensions

The pandemic's psychosocial impact on patients—fear of infection, lifestyle deterioration, and mental health distress—emerged as a critical, yet often overlooked, dimension of care disruption. Participants noted sharp declines in physical activity, worsening diets, and increased tobacco use during lockdowns, all of which accelerated NCD progression [21]. These behavioral shifts, compounded by anxiety and depression, reduced health-seeking behavior and treatment adherence. This aligns with global reports of "collateral damage" from the pandemic, where indirect effects on NCDs may surpass direct COVID-19 mortality in the long term [15, 16].

Pathways to resilience: Beyond crisis response

Participants proposed two complementary strategies to build system resilience. First, fundamental transformation through dedicated NCD clinics, telemedicine, and home-based care. Dedicated clinics—physically and operationally separated from infectious disease services—could mitigate patient fear and ensure uninterrupted access, as Shelton et al. suggest in the U.S. Veterans Health Administration [23, 24]. Similarly, Iran's existing SIB platform offers a foundation for scaling digital health solutions, including remote monitoring and e-consultations, which have proven effective in diabetes and hypertension management during the pandemic [25, 26].

Second, optimizing existing processes—including risk-stratified follow-up, private-sector data integration, and task shifting—can enhance efficiency without requiring major new investments. For instance, prioritizing high-need patients (e.g. those with comorbid diabetes and hypertension) ensures limited resources go where they matter most—a strategy also recommended by Thakur et al. [21]. Furthermore, integrating private-sector data into the national SIB system could close critical monitoring gaps, given that a significant proportion of Iranians seek care in the private sector [11].

Toward a proactive, integrated primary healthcare model

Ultimately, our findings support WHO's call to "build back better" by embedding NCD preparedness into national pandemic planning [6]. Iran's PHC system—once

hailed as a model for primary care in the Eastern Mediterranean—has the infrastructure and human resources to lead this transformation. However, this requires institutionalizing hybrid care models, ensuring workforce stability, and adopting equity-focused policies that protect the most vulnerable during crises.

A key limitation of this study is its exclusive focus on provider perspectives. While managers offer strategic insights, future research should integrate patient and frontline worker voices to capture the full spectrum of care experiences.

Conclusion

This study demonstrates that the COVID-19 pandemic severely disrupted PHC services for NCD patients in Iran, not only due to the crisis itself but also because of pre-existing systemic gaps—particularly the marginalization of chronic care in emergency planning. Key challenges included policy neglect, workforce reallocation, prolonged follow-up intervals, and patient fear-driven avoidance of care.

Participants proposed two strategic pathways to enhance resilience: Fundamental innovations—such as dedicated NCD clinics, telemedicine, and home-based care—and optimizing current processes—including risk-stratified follow-up, private-sector data integration, and task shifting. These context-specific solutions align with global calls to "build back better" by embedding NCD continuity into pandemic preparedness frameworks.

For Iran and similar health systems, ensuring uninterrupted NCD care during future crises requires proactive planning, flexible service models, and sustained investment in PHC infrastructure. Ultimately, a truly resilient health system must protect both acute and chronic care—simultaneously and equitably.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Research Ethics Committee of Iran University of Medical Sciences, Tehran, Iran (Code: IR.IUMS.REC.1400.375). All participants provided verbal informed consent, and all data were anonymized during transcription and analysis.

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Authors' contributions

All authors contributed equally to the conception and design of the study, data collection and analysis, interpretation of the results, and drafting of the manuscript. Each author approved the final version of the manuscript for submission.

Conflict of interest

The authors declared no conflict of interest.

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