

COVID-19 Health System Challenges and Adaptations: Implications for Resilience and Universal Health Coverage in Zimbabwe

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Abstract

Background: Universal Health Coverage (UHC) seeks to ensure equitable access to quality health services without financial hardship. Progress toward UHC had slowed prior to COVID-19, and the pandemic further exposed systemic gaps. Strengthening resilient health systems is therefore critical to advancing the UHC agenda.

Aim: This study explored health system challenges and service delivery innovations implemented during the COVID-19 pandemic in Bulawayo, Zimbabwe, focusing on nurse managers' experiences in sustaining healthcare delivery.

Methods: A descriptive phenomenological design was employed to capture the lived experiences of nurse managers involved in the COVID-19 response. The study was conducted across two central hospitals and 19 city health facilities. Ten participants were recruited, with the sample size determined by data saturation. Data was collected using in-depth telephone interviews and was analysed using Colaizzi's method.

Results: Three overarching themes emerged: (1) material resource inadequacy, including shortages of oxygen, medicines, and personal protective equipment; (2) human resource constraints, marked by workforce shortages, illness-related absenteeism, and redeployments; and (3) healthcare service delivery

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adaptations. Despite significant pressures, nurses demonstrated resilience and adaptability. Innovations included dedicated COVID-19 centres, quarantine wards, specialised contact tracing teams, and pooled resource strategies that enhanced efficiency and continuity of care. Collaboration among the Ministry of Health, local authorities, and partners strengthened coordination, surveillance, and response mechanisms.

Conclusion: The study highlights the pivotal role of nurses' resilience, resource readiness, and collaborative systems in sustaining healthcare delivery during crises. Findings provide insights for future preparedness and health system strengthening to advance resilience and UHC.

Keywords: COVID-19 pandemic; challenges; health system resilience; nurse managers; service delivery adaptations; collaboration and stakeholder engagement; universal health coverage

Introduction

The World Health Organisation (WHO 2023) defines UHC as a framework ensuring that all individuals and communities can access essential, high-quality health services, including health promotion, prevention, treatment, rehabilitation, and palliative care without challenges. Its origins trace back to the WHO's 1948 declaration, which established health as a fundamental human right and called for equitable access to essential services. Building on this principle, the World Bank (2023) underscores UHC as central to realising this right, emphasising access to quality care without financial hardship. WHO (2025) further highlights UHC as a core component of the United Nations 2030 Agenda, articulated in Sustainable Development Goal 3 on health. However, progress toward UHC has faced significant setbacks, particularly due to the unprecedented disruptions caused by the COVID-19 pandemic.

Zeng et al. (2018) observe that, despite national aspirations for UHC, inequitable access to health services remains a critical challenge in Zimbabwe, with out-of-pocket payments continuing to impose substantial financial hardship on households. Similarly, the pre-pandemic health system was characterised by significant disparities in access, as public financing disproportionately favoured urban, higher-level facilities, leaving rural clinics under-resourced and unable to meet population needs (Chipunza and Nhamo 2023). Evidence from Chari and Kamninga (2025) further highlights persistent challenges related to frequent medicine stockouts across the country. Collectively, these financing and resource gaps have contributed to widespread shortages of essential medicines, constrained diagnostic capacity, and deteriorating infrastructure, particularly within public and rural health facilities.

Zimbabwe's progress toward UHC has been constrained by long-standing economic challenges, high inflation, and rising poverty, which have limited government capacity to meet the Abuja Declaration target of allocating 15% of the national budget to health.

(WHO 2025). Although the UHC service coverage index improved from 30 in 2000 to 55 in 2021, above the African average but below the global score of 68, health system performance remains undermined by severe workforce shortages (WHO 2023). Large numbers of nurses and physicians migrated during this period (Nyandoro et al. 2016; Mangundu et al. 2023). Zimbabwe has only 1.6 physicians per 10,000 people, far below the WHO benchmark of one per 1,000. Nurse density also declined from 2.5 per 1,000 in 2017 to 1.95 in 2019, compared with a global average of 37.7 per 10,000 in 2022. These shortages, coupled with inequitable distribution and skill-mix gaps, continue to impede UHC attainment (WHO 2022).

According to Hussain and Arif (2021), during COVID-19, essential healthcare services were interrupted and inaccessible across the globe; however, the situation was more challenging for countries like Zimbabwe with fragile healthcare systems. This is characterised by chronic medicine shortages, inadequate human resources, antiquated hospital equipment, archaic healthcare infrastructure, and power and water outages. This is further emphasised by Sharpley (2024), who highlighted the fact that the challenges associated with the COVID-19 pandemic demonstrated the weaknesses in healthcare systems globally. According to Adeniji et al. (2025) in their systematic review, emergencies such as the Coronavirus Disease 2019 (COVID-19) caused some disruption to the healthcare system delivery- a situation that called for adaptation to facilitate continuity of essential healthcare services. These widespread disruptions illustrated the necessity of strengthening health system resilience to ensure the continuity of essential services during crises.

Resilient health care is the capacity of a system to adjust its functioning before, during, and after disturbances to sustain essential operations (Hollnagel et al. 2013). Jamal (2020) highlights that such resilience enables continuity of service delivery during extraordinary shocks, a prerequisite for achieving UHC. It reflects the system's ability to absorb, adapt, and transform in response to acute disruptions (Kruk et al. 2025; Barasa et al. 2017). The COVID-19 pandemic further exposed major vulnerabilities, underscoring the urgent need to strengthen resilience to maintain service quality and safety (Wii and O'Hara 2021).

This study explored health system challenges, as well as the service delivery innovations and adaptations implemented during the COVID-19 pandemic to advance the UHC agenda within the framework of resilient health systems. In addition, the researcher also sought to find out what lessons could be drawn from the innovations and adaptations that were implemented during the COVID-19 pandemic in Zimbabwe to further strengthen the healthcare system in a sustainable way.

Materials and Methods

The study employed a descriptive phenomenological design to explore nurse managers' experiences during the COVID-19 response. Rooted in Husserl's philosophy,

descriptive phenomenology seeks to provide detailed accounts of lived experiences as described by those who lived them (Polit and Beck 2024). The researcher aimed at understanding the meaning of these experiences from the participants' perspectives while applying "bracketing" to minimise personal bias (Englander 2012). Open-ended questions guided the interviews, allowing participants to shape the discussion. Reflexivity was maintained throughout the study through the use of a reflexive diary, enabling the researcher to continuously reflect on and manage her own assumptions and emotions during data collection and analysis.

Study Setting

The study was conducted in Bulawayo, the second largest city in Zimbabwe. The study setting included two central hospitals and 19 city health facilities. The central hospital serves as a tertiary-level institution providing specialised healthcare services, while city health clinics are primary health facilities. These clinics provide the following services: provision of care for minor illnesses; management of non-communicable diseases (for example, hypertension, diabetes, and asthma), including monitoring and follow-up; and delivery of HIV testing and counselling, as well as TB screening and treatment. During the COVID-19 period, one central hospital housed a COVID-19 centre where patients who contracted the virus and were severely ill or required critical care were admitted. The other central hospital had created a COVID-19 investigating ward that admitted patients who had non-communicable diseases and were also presenting with COVID-19 signs and symptoms or were waiting for COVID-19 test results. The study setting also included all the clinics in the city, and these played a crucial role in screening for COVID-19, all clients who visited the primary healthcare facilities and did contact tracing.

Participants and Sampling Procedure

The inclusion criteria were as follows: nurse managers working in areas where COVID-19 response activities were implemented, including contact tracing. Participants comprised nurse managers who were drawn from both the central hospital and city health facilities, thereby providing perspectives across different levels of the health system. They oversaw departments or units that provided direct care to COVID-19 patients, those still undergoing investigations, and some were leading teams conducting contact tracing. Nurse managers from both settings participated. This also offered diverse insights into managerial experiences and health system responses during the COVID-19 pandemic. Nurse managers from both settings participated, offering diverse insights into managerial experiences and health system responses during the COVID-19 pandemic.

Following ethical approval for the study, ten participants who met the inclusion criteria were recruited using purposive sampling and snowballing as described by Polit and Beck (2024). This approach allowed initial study participants to refer other nurse

managers who played an active role in COVID-19 activities and made recruitment possible across different health facilities. Snowball sampling was particularly appropriate to access study participants during the COVID-19 pandemic. According to Marshall (1996), participants should be selected based on their ability to provide detailed and relevant information about the phenomenon being studied, and as Creswell and Creswell (2018) emphasise, it is essential that all participants share similar lived experiences of that phenomenon.

Data Collection

Due to COVID-19 restrictions and persistent related concerns, data collection was conducted between December 2021 and February 2022. In-depth, unstructured individual telephonic interviews were used, guided by a central question posed to all study participants.

Given the fact that COVID-19 was a novel disease, the use of unstructured interviews was essential to gain an in-depth understanding of the lived experiences of nurse managers. All interviews were audio-recorded with the consent of the participants as articulated by Van Manen et al. (2016). Each participant was initially asked a grand tour question: *'What have been your experiences in executing your duties as a manager during the COVID-19 pandemic?'* This was followed by probing and follow-up questions that encouraged participants to elaborate on or clarify their responses.

The interviews, conducted in English by the first author, lasted between 30 and 60 minutes, providing each participant sufficient time to share their experiences as nurse managers during the COVID-19 outbreak. All the collected data were transcribed verbatim within 24 to 48 hours, enabling the researchers to begin preliminary analysis promptly. This process facilitated preparation for subsequent interviews and aided in determining data saturation.

A sample size of 10 participants was determined by data saturation. This point signifies a sense of closure, where additional data no longer contribute new insights but rather repeat previously obtained information (Korstjens and Moser 2018; Polit and Beck 2024). Saturation occurred at participant number seven; however, three additional interviews were conducted to confirm consistency and ensure the completeness of the findings, bringing the total to 10. A sample size of 10 participants is appropriate for this descriptive phenomenology study because phenomenological inquiry prioritises depth and richness of participants' lived experience rather than numerical generalizability. Because the methodological aim is to obtain detailed, nuanced descriptions of lived experience, a relatively small sample, typically between four and 10 participants, is considered adequate to support rigorous phenomenological analysis (Polit and Beck 2024).

Data Analysis

Colaizzi's method of data analysis was used to analyse the interview data (Speziale et al. 2011). This approach follows seven steps approach as described below:

First, each interview transcript was read repeatedly to gain a comprehensive understanding of the content, while researchers bracketed their preconceptions. This enabled a deeper exploration of the phenomenon as experienced by study participants themselves (Giorgi 2020; Shosha 2012). Second, significant statements describing nurse managers' experiences during the COVID-19 pandemic were extracted. Two researchers independently reviewed these statements to ensure clarity and accuracy, then compared interpretations and reached a consensus in line with Colaizzi (1978) and Giorgi (2020).

In the third step, meanings were formulated from the significant statements, with both researchers cross-checking interpretations against the original transcripts. An experienced qualitative researcher (LT) further verified the consistency of this process. Fourth, the formulated meanings were organised into clusters of themes, refined into emergent themes, and validated for accuracy by the experienced researcher (Shosha 2012).

During the fifth step, all emergent themes and their associated meanings were synthesised into an exhaustive description of the phenomenon, capturing nurse managers' experiences during the pandemic. This description was reviewed to ensure richness and completeness. In step six, the fundamental structure of the phenomenon was derived by distilling the exhaustive description into core elements that reflected the essence of participants' experiences (Maher et al. 2018).

Finally, step seven involved member checking to validate the findings, following Alase (2017). Results were shared with each participant and discussed in follow-up telephone conversations. Participants confirmed that the findings accurately represented their feelings and experiences. This iterative, collaborative process strengthened the credibility and representativeness of the analysis.

Trustworthiness

Measures were implemented to ensure the trustworthiness and rigour of the study. According to Polit and Beck (2024), to ensure trustworthiness, the research should satisfy four criteria, namely credibility, transferability, dependability, and confirmability. To strengthen trustworthiness and rigour, the study applied Lincoln and Guba's trustworthiness criteria: credibility, transferability, dependability, and confirmability, complemented by the authenticity considerations. Credibility refers to the accuracy of the findings (Lincoln and Guba 1985). To enhance credibility, all interviews were audio-recorded and transcribed verbatim. Member checking was

conducted to enhance the credibility of the findings, with participants confirming that the results accurately represented their perceptions, feelings, and lived experiences.

Additionally, an independent qualitative research expert, external to the study context, reviewed audio recordings, transcripts, emerging categories, and final themes. This independent review, according to Giorgi (2020), helped verify that the findings accurately reflected participants' accounts, further enhancing rigour and credibility. Transferability relates to the ability of the findings to be transferred to other contexts (Polit and Beck 2024). To support this, the researchers thoroughly described the research context, participants, and data collection method, enabling readers to judge the relevance of the findings to their own contexts. To enhance dependability, the research process is described in detail to ensure an audit trail and enable another researcher to replicate the study (Beck 2019). Dependability was further enhanced through repeated coding and recoding, as well as comparison of themes and categories with a co-coder. To ensure authenticity and accurate representation of participants' lived experiences, verbatim quotations were included (Moule and Goodman 2014). Confirmability was strengthened through reflexive bracketing to reduce researcher bias. Acknowledging that participants' experiences are interpreted through the researcher's subjectivity, the primary author engaged in ongoing self-reflection to identify and set aside personal assumptions, emotions, and biases. This reflexive practice, as recommended by Creswell and Creswell (2018), supported greater objectivity and enabled the findings to be presented from participants' perspectives in an open and non-judgemental manner.

Ethical Consideration

Protecting participants' rights constitutes a key ethical consideration in research (Polit and Beck 2024). To ensure full adherence to the study protocol, the informed consent documents and research instruments were reviewed and granted ethical clearance by the Medical Research Council of Zimbabwe (MRCZ/A/2680) before the study commenced. Additional permission to conduct the study was granted by the Ministry of Health and Child Care. Each participant received a comprehensive information sheet outlining the purpose, procedures, and requirements of the study, after which written informed consent was obtained. The consent process emphasised that participation was purely voluntary and that interviews would be audio-recorded only after obtaining explicit permission from each participant. Participants were also informed of their right to decline or withdraw from the study at any stage without any consequences. In addition, they were assured both verbally and in writing that all data would be treated confidentially and reported in a way that does not show identification of the informants. To enhance anonymity, identifying details were removed from transcripts and pseudonyms were used. All data were securely stored on a password-protected computer in the principal investigator's office for a period of five years. Access to the data was restricted only to the research team.

Results

Table 1 presents the demographic characteristics of the study participants, including age, gender, professional role, and years of managerial experience. The sample comprised 10 nurse managers with 10 to 20 years of management experience, the majority of whom (80%) were females.

Table 1: Participant's demographic information

Identity Number	Age Range	Gender	Management Experience	Management Role
ID1	41-45	Female	8 years	Team leader
ID2	46-50	Female	10 years	Facility Manager
ID3	46-50	Female	12 years	Facility Manager
ID3	56-60	Male	15 years	Facility Manager
ID4	51-55	Female	12 years	Team leader
ID5	51-55	Female	14 years	Community Health Manager
ID6	51-55	Female	13 years	Community Health Manager
ID7	56-60	Male	15 years	Community Health Manager
ID8	56-60	Female	16 years	Primary Healthcare Manager
ID9	56-60	Female	14 years	Team leader
ID10	61-65	Male	19 years	Primary Healthcare Manager

Following data analysis, three overarching themes emerged, as shown in Table 2 below.

Table 2: Themes and Sub-themes

Themes	Sub-themes
Material Resources Inadequacy	1.1 Inadequacy of oxygen supplies 1.2 Shortage of medicines and diagnostic equipment. 1.3 Shortage of Personal Protective Equipment
Human Resource Constraints And Resilience	2.1 Workforce shortages 2.2 Redeployment of nurses 2.3 Nurses' Resilience
Healthcare Service Delivery Adaptations	3.1 Integrated management of COVID-19 3.2 Pooling of resources 3.3 Collaboration and stakeholder engagement

Theme 1: Material Resources Inadequacy

This overarching theme that emerged captures the critical shortages that shaped nurse managers' experiences during the COVID-19 pandemic. It comprises three sub-themes outlined below:

Sub-theme 1.1: Inadequacy of Oxygen Supplies

The participants noted that the oxygen supply was inadequate, yet it was crucial for the management of COVID-19 patients, particularly those in respiratory stress. Participants highlighted significant challenges related to oxygen availability and functionality, as illustrated in the following accounts.

One participant said: "The supply of oxygen was just not enough, with some instances of interruption. This was frustrating both the patients and the providers of care. Such a situation influenced patient care".

Another participant had this to say: "Also, where oxygen tanks were available, you find that the necessary connecting equipment, such as the oxygen gauge, was non-functional, or the connecting tubing was leaking".

Participants also described uneven access to piped oxygen across departments, creating significant challenges during emergencies, as was verbalised by one nurse manager: "Although piped oxygen was available in some departments, such as the emergency unit, other wards did not have it. In emergencies like respiratory distress, patients had to be moved to those departments, a really challenging situation."

Sub-theme 1.2: Shortage of Medicines and Diagnostic Equipment

Participants reported that shortages of essential medicines and diagnostic equipment during the COVID-19 pandemic affected patient care and treatment continuity.

A recurring concern among participants was the persistent shortage of essential medicines and diagnostic equipment, which they felt significantly hindered timely and effective patient care and treatment continuity. The following accounts illustrate these challenges.

One participant expressed thus: “Some admitted COVID-19 patients had, in some instances, expected to buy medicines, for example, azithromycin, because it was out of stock in the hospital pharmacy. It was really concerning, relatives had to make efforts to buy these, however it was worse for patients from poor socioeconomic backgrounds”.

On a related concern, another participant expressed the fact that: “There was also a challenge of glucometers in the hospital, some not working and some not having sticks for testing. This scenario, in some instances, forced patients who needed to have frequent blood sugar testing to either purchase the glucometer or the required testing sticks”.

Sub-theme 1.3: Shortage of Personal Protective Equipment

The participants stated that the insufficient personal protective equipment (PPE) supplies were experienced mostly during the first days of the COVID-19 pandemic.

Reflecting on the early days of the pandemic, a participant noted: “There were challenges with PPE; there were not enough during the first days of the COVID-19 pandemic. The nurses expressed so much fear of contracting the disease, worse still with inadequacy of PPE”.

One participant described the situation this way: “As a manager, I felt helpless and incompetent in executing my duties. It was difficult to make sure that the nurses were protected from the COVID-19 infection since there were insufficient supplies of PPE. But with times, the PPE supplies were adequate”.

Theme 2: Human resource constraints and resilience

This theme highlights the dual challenges associated with human resource constraints and the remarkable resilience demonstrated by nurses during the COVID-19 pandemic.

Sub-theme 2.1: Workforce Shortages

This sub-theme is about challenging issues emanating from the shortage of nurses and reassignments during the pandemic, as shown in the following excerpts.

Workforce shortages emerged as a major constrain during COVID-19. The following accounts illustrate these challenges.

One participant described how the staffing shortages were worsened by the pandemic: “Before the start of COVID-19, shortage of nurses was already an existing challenge. The COVID-19 situation and the response-related activities made the situation worse”.

Another manager expanded on this challenge as follows: “The major challenge was the persistent shortage of staff, because some nurses were reassigned for COVID-19 activities. Worse still, in some instances they were sick from the disease or were contacts, hence had to stay home”.

Another participant highlighted the impact of these shortages on workload, emphasising the strain placed on nurses during the pandemic: “Nurses faced excessive workloads due to inadequate staffing and the new COVID-19-related activities. In addition, all these tasks required some form of adjustments”.

One of the effects of workforce shortages was the delay of COVID-19 test results. Another participant noted the following:

Another participant stated: “One of the major challenges during the COVID-19 pandemic was the prolonged turnaround time for test results. In some instances, results were significantly delayed due to high specimen volumes and staff shortages”.

Sub-theme 2.2: Redeployment of Nurses

The pandemic necessitated **workforce redeployment**, with nurses reassigned to COVID-19–related duties to address emerging service demands. The extracts below support that:

One participant described how the city’s COVID-19 response required the reassignment of nurses across facilities, explaining that: “As a way of responding to the calls of the pandemic, as a city, we reassigned nurses from different facilities to specifically conduct COVID-19 activities. This reassignment meant that nurses had to change their work stations”.

Another respondent elaborated on different roles nurses assumed following redeployment, noting that: “There were nurses that were involved in doing COVID-19 contact tracing, tracking, and testing of these contacts as well as counselling of affected families. Some nurses provided care to admitted COVID-19 patients”.

Sub-theme 2.3: Nurses’ Resilience

Nurses’ resilience emerged as a powerful thread across the interviews, with participants describing how nurses continued to display commitment, deliver care despite intense

pressures, shifting responsibilities, and the emotional toll of the pandemic. The following accounts illustrate that.

One participant highlighted nurses' ability to adapt and persist despite immense pressures, stating that: "Despite overwhelming workloads, staff shortages, and constantly shifting COVID-19 demands, nurses adapted to new roles and conditions while continuing to provide care with remarkable perseverance and resilience".

Another participant reinforced this view, describing how nurses continued to persevere even as responsibilities expanded, stating that: "Nurses faced excessive workloads due to inadequate staffing and the new COVID-19 related activities. In addition, all these tasks required some form of adjustments, nurses continue to persevere".

Yet another participant emphasised the determination nurses showed in the face of fear and exhaustion, explaining that: "Despite the increased workload, the long working hours and the fear of contracting the disease, the nurses continued to work and serve the nation".

Theme 3: Healthcare service delivery adaptations

Sub-theme 3.1: Integrated Management of COVID-19

Participants reported that the COVID-19 pandemic prompted major adjustments in service delivery, including establishing dedicated centres, quarantine wards, and contact tracing teams. Participants described a range of innovative measures implemented at institutional and community levels as part of the COVID-19 response:

One participant described the organisational measures introduced to strengthen the COVID-19 response activities, explaining that: "Some organisational strategies were implemented as a way of controlling the pandemic. These included the establishment of a dedicated COVID-19 centre, creation of an investigation ward and quarantine centres".

Another manager elaborated on the establishment of quarantine facilities and stated that: "Quarantine centres were set up to manage and monitor suspected cases, especially those who had been in contact with confirmed patients or had travelled from outside the country."

Further, one other participant highlighted the creation of specialised wards and teams to support surveillance and case management, stating that: "There were wards that were designed specifically to admit suspected or confirmed cases. In addition, specialised teams were formed to coordinate contact tracing and surveillance activities".

One manager also described how designated COVID-19 spaces were created and utilised: "We created a designated COVID-19 centre and an investigation ward where

suspected cases were kept while waiting for their results before being admitted to the main medical wards.”

Sub-theme 3.2: Pooling of Resources

The participants highlighted the fact that, as part of resource mobilisation, human and material resources were pooled together for use in COVID-19 response activities, as shown in the extracts below:

One participant described how coordination across teams strengthened the pandemic response activities, stating that: “There was a lot of coordination among teams to make sure resources were shared efficiently, and that quarantine and isolation centres were well supported”.

Another respondent highlighted the redeployment of nurses into specialised teams, explaining that: “Nurses from different facilities in the city were put in different teams that played a pivotal role, for example, in contact tracing”.

An additional participant pointed to the direct clinical roles nurses assumed in COVID-19 care, stating that: “Some nurses were assigned to directly provide care to COVID-19 patients.”

One manager also emphasised the pooling of material and logistical resources to support the response, noting that: “There was also material and logistical resource pooling. Resources such as vehicles were organised and allocated to different teams”.

Sub-theme 3.3: Collaboration and Stakeholder Engagement

Collaboration and stakeholder engagement were central to the COVID-19 response, with coordinated, multi-sectoral efforts strengthening planning, surveillance, decision-making, and resource mobilisation. The following extracts show that: One participant described coordination activities as follows: “We held meetings that brought together representatives from the City Council, the Ministry of Health, and implementing partners. These meetings focused on identifying successes, gaps, and challenges, and were instrumental in strengthening coordination and contributing to the overall success in containing the pandemic.”

Another participant stated: “There was a surveillance system that was in place, and weekly reports were produced. A trend analysis was done and discussed in these meetings. We also discussed and came up with means of addressing any identified gaps”.

Emphasising the importance of stakeholder collaboration during the pandemic, one manager stated that: “There were coordinated efforts in the management of COVID-19.

This called for strong collaboration with different stakeholders for resource mobilisation.”

Discussion

The study revealed a critical shortage of medical oxygen during the COVID-19 pandemic, a gap that directly compromised the management of patients in respiratory distress. This finding is not unique to Zimbabwe, as Gowda et al. (2022) in a study in India noted that during the COVID-19 pandemic, the inequity of medical oxygen was apparent. In relation to this challenge, Mangipudi et al. (2020) found that in Sub-Saharan Africa, less than half of the hospitals surveyed had a continuous oxygen supply. In the context of UHC, this is concerning. Sodero et al. (2025) indicate that **inequities in medical oxygen access are not accidental** but rather emanate from the **long-standing systemic neglect** of oxygen as a critical public health resource. In addition, the author further advocates for *oxygen justice*, ensuring continuous, transparent access to medical oxygen as a fundamental component of the right to health and well-being. Lucero-Prisno et al. (2020).

This shortage signals deeper systemic weaknesses rather than a temporary crisis. The alignment with findings from India and Sub-Saharan Africa suggests that oxygen scarcity is a structural issue rooted in long-standing underinvestment, not an isolated Zimbabwean experience. This finding shows a broad lack of emergency preparedness and the need for sustained investment in essential life-saving equipment.

Besides the inadequacy of oxygen during the pandemic, a shortage of medicine was also experienced, and with some patients ending up buying their medicine, a situation that was difficult for low-income patients. As in this study, during the COVID-19 pandemic, a critical shortage of medical supplies and PPE was noted in a South African study, as was reported by nurse managers (Tukisi et al. 2025). Several other studies also reported the insufficiency of resources, including PPE, for example, a Sudanese study by Lucero-Prisno et al. (2020) and Bajaria and Abdul (2020) in Tanzania. The critical supply shortages during the COVID-19 pandemic were also highlighted by Ranney et al. (2020). Despite this resource-related challenge, evidence has demonstrated that the use of PPE is crucial to prevent exposure to infectious diseases such as COVID-19, hence the need for accessible, quality-assured personal protective equipment (Park 2020). The literature indicates that a shortage of PPE is experienced across Africa. In this instance, it was compromising staff safety at a very critical time. The findings highlight the tension between standard best practice and the situation obtaining in resource-limited settings. The resource inadequacies observed during the COVID-19 pandemic demonstrate significant gaps in the healthcare system that can affect the attainment of the UHC agenda and hence the emphasis on strengthening health system resilience (Debie et al. 2024).

The study found instances of hospitalised COVID-19 patients having to purchase their own medicines due to stock shortages, posing significant challenges for individuals of low socioeconomic status. Related to this, Al Zoubi et al. (2021) stated that to contain the COVID-19 pandemic, countries came up with policies such as lockdowns, border closures and curfews that affected the drug supply chain, leading to drug shortages. Similarly, Bookwalter (2021) attributes the shortage of medicines experienced during COVID-19 to stockpiling and panic buying, which significantly contributed to supply disruptions. Medicine shortages were due to supply chain disruptions and panic buying due to COVID-19. It is worth noting that these only exacerbated pre-existing fragilities in Zimbabwe's pharmaceutical supply chain. What became evident from the findings was that COVID-19 did not give birth to medicine stockouts but only amplified the existing chronic shortages. This emphasised the need for a robust supply chain governance system.

The shortage of healthcare workers in African countries is a persistent public health challenge (Adeloye et al. 2017), and this has been a contributory factor in failing to achieve SGD 3 and UHC (Ahmat et al. 2022). The shortage of human resources, as identified in this study, was further exacerbated during public health emergencies such as the COVID-19 pandemic (Sharpley 2024). This finding underscores the critical need to strengthen resilient healthcare systems across Africa, not only to withstand health crises but also to sustain service delivery beyond the COVID-19 pandemic (Gebremeskel et al. 2021; Kruk et al. 2025). Despite these persistent challenges, including severe workforce shortages and the adverse conditions imposed by the pandemic, nurses continued to deliver care with notable commitment, adaptability, and resilience.

Research consistently shows that nurses exhibited notable resilience during the COVID-19 pandemic, despite the intense psychological and occupational pressures they faced. Manzanares et al. (2021) found that nurses maintained high resilience under demanding conditions, while Chipps et al. (2025) reported moderate resilience among South African nurses, reflecting their capacity to adapt and cope in adversity. This aligns with broader evidence recognising resilience as a crucial protective factor that buffers the psychological and emotional impacts of traumatic events and public health crises (Labrague 2021; Pollock et al. 2020). Beyond individual responses, resilience was also demonstrated at the health system level, where rapid modifications to health service delivery, including the development of context-specific guidelines and innovative care approaches, were implemented by Ministries of Health, UN agencies and health partners to sustain essential services (Prager et al. 2025). Such findings underscore resilience as both a personal attribute and a structural capacity that enables nurses and health systems to maintain care provision under unprecedented pressures (Wu and Ho 2022).

Due to significant resource constraints, nurse managers and health authorities were compelled to develop innovative approaches to health service delivery to contain the

spread of COVID-19 and maintain the continuity of essential healthcare services. In the context of this study, these adaptations included the establishment of a dedicated COVID-19 treatment centre, the creation of an investigation ward for suspected cases awaiting test results before admission to medical wards, and the setup of quarantine centres. Additionally, human and material resources were pooled, and specialised teams were formed to undertake COVID-19 contact tracing and coordination activities. Similarly, Ammor et al. (2020) reported the repurposing of existing health services, including the allocation of specific clinical units to manage suspected COVID-19 cases. Building on these adaptive strategies, tailored healthcare services and consultations were introduced to ensure continuity of care during lockdowns (Ahmed et al. 2020). Telephone consultations enabled patients to obtain healthcare advice and continuous monitoring for both COVID-19-related conditions and non-communicable diseases, thereby ensuring the continuity of essential health services despite movement restrictions.

The findings suggest that Zimbabwe's health system has a latent adaptive capacity that must be nurtured and institutionalised for robust preparedness for further emergencies.

Conclusion

This study demonstrates that the COVID-19 pandemic simultaneously exposed long-standing systemic weaknesses and revealed the adaptive capacity within resource-constrained healthcare settings. While shortages in manpower and essential resources intensified service delivery pressures, the resilience and commitment of nurses played a pivotal role in sustaining essential care. The study's unique contribution lies in illustrating how frontline resilience interacts with systemic fragilities and how crises can act as catalysts for innovation, collaboration, and health system strengthening in resource-limited contexts. These insights underline the urgent need for policies that prioritise emergency-preparedness financing, workforce capacity building, and supply chain robustness to ensure continuity of care during future health shocks. Strengthening institutional support mechanisms and embedding adaptable service delivery models into routine practice are essential steps for achieving resilient and responsive healthcare delivery.

Ultimately, building such resilience is central to advancing progress toward UHC by safeguarding equitable access to care during both routine operations and public health emergencies.

Limitations

The study was conducted in urban healthcare facilities; therefore, its findings may not be applicable to rural settings, where shortages of material and human resources are

often more pronounced. Nevertheless, despite this limitation, the findings remain valid, and the lessons drawn are invaluable.

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