BMC Nursing

RESEARCH

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Management of resources during COVID-19 pandemic at an academic hospital in Gauteng, South Africa: nurse managers' experiences

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Abstract

Background The onset of the COVID-19 pandemic required the mobilization of resources specifically for managing patients during the pandemic. The need for the mobilization of resources at the time of COVID-19 increased the nurse managers' responsibilities regarding the management of resources. Failure to prioritize the requirement for resource mobilization during COVID-19 can result in several adverse effects, notably in terms of nurse managers' obligations. Such a negative incident could result from decreased quality and patient safety. The study, therefore, sought to examine the nurse managers' resource management experiences under the new context caused by the pandemic.

Objective The study aimed to explore and describe nurse managers' experiences regarding managing resources during the COVID-19 pandemic in an academic hospital in the Tshwane District of the Gauteng Province.

Methods A qualitative, exploratory, descriptive, and contextual research design was followed. Twenty-six purposefully sampled nurse managers attended semi-structured interviews. A thematic analysis was conducted to identify patterns and themes within the data collected.

Results The following three themes emerged: The nurse managers experienced budget constraints to address the patient's health needs. More human and material resources are needed, which makes monitoring patient care challenging. Lastly, the hospital infrastructure needed to be Inadequate and unsupportive for easy management of the pandemic.

Conclusion The management of resources is critical for managing crises. Therefore, the managers must actively participate in the strategic plans and budget allocation meetings. The nurse manager's active involvement in budgetary plans will enable the managers to pre-empt administrative challenges in case of disaster. Consequently, the nurse managers may have control over finance, human, and material resources in their roles as accounting officers.

Contribution The findings provided some insights into the experiences of nurse managers in managing resources during the COVID-19 pandemic. It will assist nurse managers in reviewing existing contingency plans to address intensified and prolonged crises like COVID-19 pandemic.

Keywords Experiences, Nurse managers, Management of resources, COVID-19

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Introduction and background

COVID-19 refers to a global coronavirus outbreak, an infectious disease characterized by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) [1]. The 19 Covid cases were first discovered in China in December 2019, followed by a rapid infection rate globally [2]. According to the global statistics, the virus infected over 687 million people worldwide [3]. Although the Covid 19 produced mild to moderate symptoms in patients, most patients presented with severe and life-threatening complications that warranted admission to the intensive care units (ICU) of the hospitals [4]. Consequently, the admission rate in the ICU has risen by close to 70%. Unfortunately, most of the infected patients lost their lives, as evidenced by a death toll of almost 6.87 million [5].

The management of resources in the nursing management context refers to the efficient and effective deployment of the resources necessary for the provision of patient care [6]. The resources necessary for the provision of patients' care include personnel, medical supplies and equipment, and financial and infrastructural resources [6]. Nurse managers are responsible for ensuring a balance between the supply of resources and clinical demands for the resources [7]. Therefore, the nurse managers, as accounting officers, are responsible for drawing budgets based on the needs of their respective wards [7]. The nurse manager is regarded as an expert in their respective wards and represents their wards during strategic and operational plans of the hospital [8]. In such settings, the nurse managers are responsible for presenting their plans to manage and monitor the proper utilization of human, financial, and material resources [9]. The role and responsibility of the nurse managers were altered by the onset of the coronavirus disease 2019 (COVID-19) pandemic.

The detrimental effects of COVID-19 in a global health context resulted in the need to mobilize human, material, and infrastructural resources to contain the virus. However, the mobilization of these resources had direct implications on the roles and responsibilities of the nurse managers. The accelerated admission rates posed a threat to the already existing shortage of staff. Consequently, the hospitals were obliged to seek additional human resources to deal with a high influx of patients [10, 11]. On the other hand, the accelerated admission rates in the ICU required the mobilization of ICU-trained and experienced personnel, which narrowed the pool of nurses to be recruited [12]. In addition, there was a need to mobilize the ICU-specific equipment necessary to care for the patients needing respiratory support [11, 12]. The study explored and described nurse managers' experiences managing resources during the COVID-19 pandemic.

Study setting

The study was conducted at an academic hospital in Pretoria, Gauteng Province, and the Tshwane region. The hospital is divided into 44 wards (eight for COVID-19 patients) and 10 outpatients departments (OPDs), with 1 652 approved beds and 1 370 usable beds. The hospital under study is a level 3 hospital with referrals from other provinces, such as North West and Limpopo Provinces, with an overall combined population of 1.7 million. At the time of COVID-19, the hospital had eight wards designated for COVID- 19.

Research design

Method

A qualitative approach, an exploratory and descriptive study design, was followed to explore in-depth the lived experiences of nurse managers regarding resource management. The study was contextualized to understand resource management by nurse managers in an academic hospital.

Sampling

A non-probability purposive sampling method was used to select 30 nurse managers from the population of 90 nurse managers in the academic hospital. The nurse managers needed to meet the following inclusion criteria to be included in the sample.

- Nursing managers with three years of experience in hospital management
- with a qualification in Nursing Administration and
- willingness to take part in the study.

The exclusion criteria

- All nursing managers with less than three years of experience were excluded.
- Professional nurses heading the unit but not appointed as operational managers or acting as assistant managers over the years were also excluded.

A total of 26 nurse managers participated in the study, which resulted in an 87% response rate.

Data collection

Interviews to collect qualitative data were conducted between June and July 2022. Data collection only commenced upon approval from the SMU Research Ethics Committee to conduct the study and approval from the hospital's Chief Executive Officer (CEO). The researchers arranged a meeting with the nursing services manager who acted as gatekeepers regarding the research to address the entire target population, including both day and night staff. The researcher gave a 20-minute

PowerPoint presentation of the proposed study at the meeting. The researcher circulated the invitation leaflet to those interested in participating. Thirty participants showed interest and signed the consent form. Data saturation for was reached at the 19th participant. The researcher conducted seven more interviews to confirm the data saturation. There were 26 participants at the end of data collection, representing about 87% of those initial respondents who had been initially scheduled to be interviewed. A researcher conducted a semi-structured face-to-face interview within 30–45 min, voice recorded in the selected hospital's boardroom upon obtaining consent for participation and audio recording. The central question emanating from the research objective was developed to get in depth information of the phenomenon under study. All participants were asked one central question:

> *As a nurse manager, what is your experience managing resources during the COVID-19 pandemic in an academic hospital?*

Based on the participants' responses to the central question the participants were probed to elaborate and provide examples supporting their statements. The probes were used to obtain thick and rich data from the participants. The following sample of probes were extracted from the transcribed data:

- You mentioned that you needed to contravene overtime policies to mitigate the shortage. May you please elaborate?
- You mentioned that most of the nurses did not have the necessary skills to adequately meet the needs of an ICU patient, May you please explain that further?
- I heard you say it was a learning opportunity for everyone, what might those learning opportunities be?
- May you please elaborate more on the statement "The nurses showed resilience throughout?

Ethical consideration

The study received ethical approval from the SMU Research Ethics Committee, ethics number 108/2022—permission to conduct the research granted by the CEO of Academic Hospital. The study involved human participants. Therefore, consent was sought to participate in the study. The study is qualitative in nature therefore the clinical trial number is not applicable. Additionally, the privacy, confidentiality, and anonymity of participants were ensured by not naming them participants. Codes specific for data collection, analysis, and discussion were generated. The data about the study was saved in a password-encrypted electronic file accessible to the researchers.

Trustworthiness

To increase the trustworthiness of the study, we adhered to five principles of credibility, transferability, dependability, confirmability, and authenticity [13]. Credibility was ensured by thorough documentation of the research processes and ensuring that data was collected until data saturation was reached. Services of the independent coder were employed to analyze data and were followed by a consensus discussion meeting to agree on the themes. A code recode process was followed, thereby achieving dependability. The participants' demographic information justified their selection and relevance for participation in the study, thereby achieving transferability and generalizability of the findings [13].

Data analysis

Qualitative data was collected from 26 participants and their demographics are summarized in Table 1 below.

The qualitative data from the semi-structured interviews was analyzed using Six steps of thematic Analysis [14]. The researcher listened to the voice recordings and read the transcriptions intensely to familiarize self with the data. The researcher kept field notes of the dataset, enhancing the data quality [15]. The immersive reading enabled the researcher to highlight the phrases to generate codes that were examined, labelled, and re-examined. Lastly, the codes were compiled into a complete analysis of nurse managers' experiences managing the academic hospital's resources during the COVID-19 pandemic. An independent coder with experience in qualitative research was employed to analyze transcribed data. A consensus meeting was arranged to discuss and conclude the data analysis findings. Table 2 summarizes the findings of the findings of the study.

Theme 1: Budget constraints

The nurse managers dealt with severe budget constraints, exceeding the budget for medical supplies and human resources because of the increased in-hospital admission rate.

Category 1: The day-to-day running of the hospital exceeded the allocated budget

The increased in-hospital admission rate led to an even higher demand for supplies necessary for the day-to-day running of the hospital wards. The high influx of patients resulted in an imbalance between the demands and supplies, as the initial budget plans did not include COVID-19. Consequently, the nurse managers had to revisit their budget plans. Nurse managers elaborate:

> *It was difficult to control the institution's budget because we did not have enough to cater for COVID (P15)*

Table 1 Details of the demographic characteristics of the participants

Participants codes	Age	Gender	Unit	Position	Years of experience	Highest qualification
P 1	45	Female	Neurosurgical	OPM	5	Master's degree
P 2	48	Female	Trauma ward	OPM	3	Bachelor's Degree
P 3	36	Male	Paediatric ward	OPM	3	Bachelor's Degree
P 4	48	Female	General surgery	ASM	5	Honours degree
P 5	51	Female	Medical ward	OPM	3	Bachelor's Degree
P 6	42	Female	COVID-19 Ward	OPM	3	Master's degree
P 7	46	Male	MHCU	OPM	6	Postgraduate Diploma
P 8	48	Female	A&E	ASM	10	Diploma
P 9	58	Female	Operating Theatre	ASM	5	Bachelor's Degree
P 10	58	Female	Critical care cluster	ASM	20	Master's Degree
P 11	48	Female	Night supervision	ASM	3	Master's Degree
P 12	55	Female	IPC	ASM	5	Master's degree
P 13	59	Female	Operating theatre	OPM	3	Bachelor's Degree
P 14	56	Female	Night manager	ASM	7	Bachelor's Degree
P 15	36	Male	Night manager	OPM	3	Diploma
P 16	53	Female	OPD	OPM	6	Bachelor's Degree
P 17	59	Female	Night manager	ASM	4	Bachelor's Degree
P 18	41	Female	Postnatal ward	OPM	3	Bachelor's Degree
P 19	50	Female	Postnatal ward	OPM	3	Bachelor's Degree
P 20	57	Female	Reproductive health	OPM	8	Master's degree
P 21	49	Female	OPD	ASM	4	Bachelor's Degree
P 22	47	Female	M&C cluster	ASM	4	Bachelor's Degree
P 23	59	Female	Gynae oncology	OPM	3	Bachelor's Degree
P 24	58	Female	M&C cluster	AMM	14	Bachelor's Degree
P 25	59	Female	Critical care cluster	ASM	4	Bachelor's Degree
P 26	59	Female	Nursing directorate	SNM	24	Doctoral Degree

Key:

Units: MHCU = Mental health care Unit; A & E = Accident and Emergency; IPC = Infection prevention and control; OPD = Outpatient Department. M&C = Mother and Child

Positions: OPM: Operational manager; ASM; Assistant Manager; SNM: Senior Nursing Manager

Table 2 The summary of findings

Theme	Category
1. Budget constraints	• The day-to-day running of the hospital exceeded the allocated budget.
	• Overtime payment costs overrun
2. The critical shortage of human and material resources	• Shortage of staff
	• Shortage of medical supplies
	• Shortage of medical equipment ventilators
3. Inadequate and unsupportive infrastructure	• Limited isolation rooms
	• Limited critical care units

Shoo! What a long meeting discussion on the limited budget that was quickly running out. COVID was not budgeted for, but when we were informed that there is COVID, we had to alter the budget accordingly (P26)

The sudden increase in the costs of daily running of the hospital prompted the nurse managers to relook their budgets and reprioritize items such as overtime schedules and the related costs for staff payment. The need to increase overtime was a challenge as it was not projected in the initial budget discussions and allocations.

Category 2: Overtime payment costs overrun

The high influx of patients required an even number of nurses to manage the complicated patients' needs. Therefore, the nurse managers needed to spend more on overtime costs to keep the nurses on duty. The nurse managers explained:

There was a shortage of staff. P 5

Most of the time, there were few personnel to that shortage caused by new ward with many patients, and we had to call nurses for overtime (P7)

The nurse managers expressed that they found themselves contravening the paid overtime policy for the nurses because of a critical staff shortage. Nurse managers elaborate:

They had to work extra hours, like exceeding 30% of their salaries, which is against the policy. P 25

The accelerated admission rates patients required manpower. The nurse managers had to motivate staff overtime to mitigate the already existing critical shortage of nurses, which inadvertently impacted on the material resources.

Theme 2: Critical shortage of human and material resources

Amidst the pandemic, most of the nurse managers experienced a critical staff shortage, medical supplies, and equipment needed "to provide specific healthcare services to COVID-19 patients. The critical shortage of human and material resources resulted in a decline in the quality of nursing Care.

Category 1: Shortage of staff

The nurse managers experienced that the existing nursing staff shortage escalated with the pandemic's resurgence. The Nurse managers expressed that the accelerated infection and admission rate of patients widened the imbalance in the nurse-to-patient ratio. The nurse managers explained:

Our admission rate increased dismally, While the country was going through COVID-19 waves, most of the people also needed to be admitted. Again we needed nurses, a lot of them! (P16)

As they opened new wards, we had to take the nurses from the already short- staffed teams to new wards. It was bad. (P11)

The nurse managers expressed that the infection rate amongst the nursing staff required the infected staff members to be isolated to recover from the infection, reducing the total number of staff members on duty. The nurse managers elaborated.

The number of absenteeism was unbelievably increasing due to either being sick from contracting the virus or in contact with COVID-19 person. (P3)

The staff members who became contacts had to be isolated and could not be on duty P21

Unfortunately, some of the nursing staff members succumbed to the detrimental effects of the virus, which generated fear among the staff members and contributed to absenteeism.

At the beginning of the COVID pandemic, some got sick. We lost some of the colleagues and their families. P 22

COVID-19 was very terrifying; fear was written all over the face of staff members and patients. (P3)

The nurse managers were prompted to make recommendations for recruiting the nursing staff. The nurse managers expressed that the various complications experienced by the Covid 19 patients prompted them to attempt to recruit the ICU experienced and trained nurses, which was challenging. Consequently, the COVID-19 patients were nursed by nursing staff who needed in-depth knowledge and understanding of the ICU. Nurse managers elaborated:

On doing rounds in ICU, I developed a deep feeling that those patients needed to be cared for by experienced ICU trained nurses because of their high acuity level, yet they are very few (P24)

They [Some of the nurses]were not skilled, lacked critical care nursing experience, they were not informed P 4

The imbalance in the nurse-to-patient ratio and the need for more experienced and trained nurses in the ICU raised the nurse managers' concerns about the quality of care the patients received. Consequently, the nurse managers were prompted to organize in-service training sessions for the nursing staff, which was an added responsibility. The nurse managers explained:

You find that you take nurses who are not ICU experienced to nurse, a patient who needs a specialist in this, so that's compromising the patient care. (P11)

So, you had to orientate them with so many things, including even the least of them all, having to take blood pressure, having to record, having to write, so you would wonder whether they qualified or not. P 16

On a positive note, the nurse managers were impressed by the resilience of the nurses who remained on duty during the pandemic despite the risk of being infected. Nurse managers applauded the nursing staff:

Despite the difficulty we experienced, some nurses expressed their willingness to work overtime. P 5

Staff members were willing to help even would vol-

unteer to work in a COVID situation… willing to help at any needed time. (P 2)

The critical shortage of staff was exacerbated by the cross-infection rate amongst the staff members which resulted in absenteeism due to COVID-related illnesses and complications. The quality of nursing care was a concern as some of the nurses with expertise in critical care were required to be isolated from work. The nurse's resilience and willingness to work was commendable amidst challenging circumstances including critical shortage of medical supplies necessary for nursing care.

Category 2: Shortage of medical supplies

The increase in in-hospital admissions was detrimental to the medical supplies. The nurse managers expressed an even higher usage of medical supplies needed for patient care during the pandemic than before. The nurse managers indicated.

My biggest concern was a shortage of PPE where you find that the staff do not have enough PPE, which also puts them at risk when they have to use PPE for the whole day. They have to take it off and take it on when they return from tea or lunch breaks. (P2)

The nurse managers expressed that the need to comply with Covid 19 guidelines to prevent cross-infections between patients and staff resulted in the high usage of personal protective equipment (PPE) such as masks, gloves, and protective clothing. The nurse managers had to carry the responsibility of issuing the PPE to the staff daily. The nurse managers elaborated.

… because of the scarcity, senior managers had to put a rigid measure of controlling PPE in the office; they will count the mask and protective clothing per number of staff in the ward one by one. P 1

The rapid use of the COVID-19 specific medical supplies in clinical facilities across the country resulted in the scarcity of these supplies as their demands became higher. The imbalance between the demand and supply of the PPE resulted in availability and purchasing of counterfeit PPE. The nurse managers were aware that PPE needed to be endorsed by the South African Bureau Standards (SABC). Nurse managers expressed.

It was difficult to balance the supply and demand of PPE because, despite the urgency of PPE, nurse managers had to follow a process of the supply chain to order, which was prolonged. P10

I am not sure that the PPE we received was according to set standards because they were easily tearing. P 4

The nurse managers highlighted that the low quality of the PPE used by the nursing staff may have contributed to the high infection rate amongst the staff members.

Because of poor quality PPE, many staff contracted COVID-19 virus. P13

The nurse managers were concerned about the safety of nurses caring for COVID-19 patients as there was inadequate protection against the infection. The study concluded that the scarcity and the quality of the PPE threatened the safety of the nurses and other staff members. The nurse managers were also concerned about the patients amidst the critical shortage of life-saving medical equipment such as ventilators.

Category 3: Shortage of medical equipment: ventilators

Amidst the accelerated in-hospital admission rate, the nurse managers highlighted that most patients required admission to the ICU for respiratory support. There were insufficient ventilators to assist all the patients in need. Consequently, some patients who required ventilators had to wait for the availability of ventilators, which compromised the quality of nursing care. Nurse managers narrated:

Most COVID-19 patients needed to be either in high care or ICU because COVID-19, as it is, is a respiratory disease…. but we didn't have enough ventilators, to admit patients in those units. P6

Eventually, the hospital was responsive to the recommendations made by the nurse managers to provide additional ventilators. The nurse managers explained:

I was happy when it was announced in the meeting that the institution received additional ventilators as a donation. 26

The nurse manager moved from concerns regarding the shortage of ventilators to a sense of relief when additional equipment was made available for use on patients in need of respiratory support. Unfortunately, the nurse managers still had concerns regarding the infrastructure which was unsupportive of COVID-19 guidelines.

Theme 3: Inadequate and unsupportive infrastructure

The Nurse managers expressed that the hospitals had limited spaces for the isolation rooms and critical care units.

Category 1: Limited isolation rooms

The COVID-19 guidelines mandated the isolation of patients with the virus and a social distance of 1.5 meters between the hospital beds to prevent cross-infection. The nurse managers expressed the social distancing of 1.5 meters in between beds. The reduced bed capacity of all the wards made it challenging for the hospital to manage the high influx of patients adequately. Nurse managers elaborated:

> *The spacing of beds, reduced number of beds, you know… so the limited facility issues. (P 10)*

> *The statistics of new admissions increased our bed occupancy rate and that really worried me. (p 17)*

Most of the patients had an active infection, which required isolation rooms to prevent cross-infection. Consequently, the available isolation rooms were insufficient to admit all the patients that required isolation. The nurse managers explained:

> *The ever-increasing COVID-19 infection rate was frightening, and we had to isolate the patients suspected of COVID-19*

> *At least the first ward we had was a 15-bedded ward that could be modified to accommodate patients under investigation and with positive COVID-19 results. P 26*

Although it was mandatory for patients suspected of COVID – 19 to be isolated, the hospital did not have adequate rooms for isolation to limit cross infections. Nurse managers were also worried about some of the patients who had respiratory complications and required admission in critical care units.

Category 2: Limited critical care units

The nurse managers reiterated that most patients had severe respiratory complications that required admission to the ICU. The nurse managers expressed that the total number of patients with critical conditions exceeded the bed capacity of the available ICU. The nurse managers explained:

> *Most of the time, there were few personnel in the ward which contributed to the shortage. The new wards which were opened allowed admission of patients and we now needed even more nurses (P7)*

> *Not everyone who needed ICU was readily admitted in the ICU ward. P11*

The critical shortage of ICU facilities was mitigated by the refurbishing of the general wards and were converted into critical care facilities, and the ICU was created to provide critical care services to those who needed them. The nurse managers explained:

> *So, during that pandemic, many wards had to be declared high care ICUs with the equipment suitable for those departments. 6*

> *Indeed, the conversion of wards into ICU resulted in the reduction of the hospital beds, because ICU take fewer beds than an ordinary wards. P 12*

The nurse managers were concerned about the quality of care rendered to the patients with respiratory complications and requiring critical care. The admission rate in ICU was slow, as the patients required immediate attention.

Discussion

The study aimed to explore and describe the nurse managers' resource management experiences in the academic hospital in the Tshwane district. It became evident that the nurse managers experienced challenges successfully managing the resources amidst the COVID-19 pandemic. It was clear that the pandemic introduced a new context that altered the nurse managers' span of control of the financial, human, and material resources.

According to the nurse managers the budget al.located for the day-to-day running of the hospital needed to be increased to address the health needs of the patients with COVID-19 adequately. The nurse managers' outcry for the meagre budget is valid and substantiated because the budget al.locations were requested before the beginning of the financial year [16]. Therefore, the 2020/2021 budget was not projected to address the pandemic. According to the existing literature, the daily estimated cost per in-hospital admission of a patient with Covid 19 was R14030,32 [17]. Therefore, considering the accelerated rate of in-hospital admission of patients with a prolonged stay in critical care areas may drastically exceed the allocated budget of R272 billion for healthcare services in South Africa [18].

According to the nurse managers, direct patient care was one of many overrun costs. The high influx of patients further worsened the existing critical shortages of staff. The nurse managers resolved to invite the nurses to perform paid overtime to strengthen the workforce. However, the critical shortages led to nurses exceeding 30% allocated overtime and payments. Overtime refers to the total number of hours employees have worked outside their regular and official working hours [19]. According to the Basic conditions of employment, an employee

is allowed to work at least 40 h per week (BCESA) [20]. In terms of remuneration, care must be taken for the overtime payments to be at most 30% of employees' earnings, which is the policy nurse managers knowingly contravened because of a shortage of staff [20].

The COVID-19 patients had critical conditions that required the application of critical care knowledge, skills, and experience, which most nurses lacked. This finding is consistent with the existing outcry for the shortage of ICU-trained nurses due to attrition and retirement [21]. The nurse managers were concerned about the quality of nursing care and resorted to empowering nurses to provide critical care to critically ill patients. The empowerment of nurses to perform critical and life-saving interventions is not a new phenomenon. This finding affirms the scholarly work in trauma and emergencies nursing where It is a usual practice to enrol nurses in short learning programs for clinical skills advancement [22]. The knowledge and skills advancement are reported in midwifery, where midwives are enrolled in essential steps in managing obstetric emergencies (ESMOE) [23].

The nurse managers highlighted a critical shortage of medical supplies, and PPE was a significant challenge. According to the literature, using PPE was the primary defence against contamination and infection by the virus [24]. Using PPE as a last line of defence against COVID-19 automatically caused a rise in the demand for PPE with limited supply [25]. Consequently, the national inventories of PPE were depleted, leading to the unauthorized invention of PPE by independent suppliers [26]. Unfortunately, using PPE from unauthorized suppliers resulted in nursing staff being prone to COVID-19 infections, which may explain the high infection rate among the nurses [27]. The high infection rate among the nurses contributed to the mortalities amongst the nurses, which caused a further imbalance in the nurse-to-patient ratio [11]. The nurse managers thought that accelerated infection rates and mortalities contributed to the fear of contracting the infections and dying from the virus [28]. However, the nurses continued to render nursing care. The nurse managers were appreciative of the nurse's commitment to patient care. The nurse managers were astonished that nurses continued to work selflessly even when they were at a greater risk of contracting the COVID 19 virus. This finding is consistent with the study's findings in primary healthcare settings, which found that nurses subconsciously prioritize patients' health needs over their own [29].

The nurse managers echoed that the in-hospital admission patients with COVID-19 were critical and required respiratory support. Unfortunately, there was a critical shortage of ventilators, which compromised the quality of care received by the patients. The nurse managers who experienced a shortage of ventilators confirmed the speculations made by health authorities in the public and private sectors about the looming shortage of ventilators [30]. The literature confirms that, with severe hypoxemic respiratory failure and hemodynamic instability as a complication of COVID-19, the total number of available ventilators was insufficient to address the pandemic [30]. The projections and speculations of the critical shortage may have motivated the rapid procurement of ventilators to prepare the hospital to manage the pandemic [31].

The nurse managers echoed that the hospital infrastructure was Inadequate and unsupportive for managing COVID-19 patients. The Covid-19 guidelines included the isolation of all the suspected and active cases of Covid-19, however, there was no adequate space to allow for isolation rooms. The nurse managers reiterated that most patients needed the ICU, which made it challenging to deal with such a high influx of patients. On a positive note, the hospital infrastructure was refurbished to increase COVID-19-friendly wards and the ICU. The hospital's refurbishment in South Africa was consistent with the occurrence in China, where the hospital was built in less than a week to cater to patients with Covid 19 [32].

Strengths and limitations of the study

The sample size comprised 26 participants, which was significant in ensuring the quality and richness of qualitative data. The study sheds light on the quality of nursing care during a pandemic from the lens of the nurse managers, which contributes to the need for contingency plans to be in place for health emergencies such as another pandemic. The study was limited to a single academic hospital in South Africa; although the findings are significant, they cannot be generalized to the South African context. The population included only the nurse managers; the involvement of medical managers, such as the heads of departments of the various wards, could have strengthened the descriptions of resource management in the academic hospital.

Conclusion

A qualitative and descriptive research design described the nurse managers' experiences regarding the management of resources in the academic hospital in Tshwane district. The study revealed that nurse managers undoubtedly experienced challenges in managing financial, human, and material resources. The need for reprioritization of the budgets and involvement of the nurse managers is imperative as the nurse managers have deep insights about the needs of their respective units. Implementation of nurse managers contributions to the budgetary allocations could be a point of departure in addressing the existing resource constraints. The nurse managers had an opportunity to coordinate and

supervise the nursing care under very challenging circumstances. The willingness and resilience shown by the nurses that worked during COVID-19 proved to the nurse managers that nurses are passionate and patient centred health practitioners. This experience may be used to prompt the nurse managers to show deep appreciation to the nurses and their professional development. The COVID 19 shown knowledge and skills gaps between nurses in general hospital units and critical care. This demonstrates a need for continued professional development of nurses in management of critical patients. The study suggests that in a strained country, it is imperative that proper planning, which includes contingency plans for disasters, be included during budgetary meetings. The study highlighted that although nurse managers are not directly nursing patients, their management of resources is driven by patient's needs.

Abbreviations

ESMOE	Essential steps in management of obstetrical emergencies
ICU	Intensive care unit
PPE	Personal protective equipment

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12912-025-02982-5.

Supplementary Material 1

Acknowledgements
This article is a derivative of the original master's degree study completed at the Sefako Makgatho Health Sciences University. The authors like to thank the nurse managers who took their invaluable time to participate in the study and relived their challenging moments during the phase of COVID-19.

Author contributions
MMM conducted the main research under the supervision of JML and KPT. MMM drafted the manuscript. KPT analysed data and revised the themes. JML reviewed and confirmed the themes. All Authors reviewed the manuscript prior to the submission.

Funding
The study is derived from self-funded master's study.

Data availability
No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate
The study adhered to the Declaration of Helsinki for health science research with human participants. The Sefako Makgatho Health Sciences University Research Ethics Committee (SMUREC/H/108/2022:PG) granted permission to conduct the study. Further approval was obtained from the National Department of Health to conduct the health science related research. The participants are nurse managers who are experts in their respective fields and not vulnerable. Consequently, they were approached and invited into the study through the gatekeeper. Prior to participating in the study, the research information was presented to the participants and subsequently, all the participants granted their informed consent for participation.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

Received: 5 November 2024 / Accepted: 13 March 2025
Published online: 26 March 2025

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