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Perception of healthcare workers and patients about the impact of health facility infrastructure on healthcare services in eThekwini Municipality, KwaZulu-Natal, South Africa

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ABSTRACT

Background: Although there are several health facilities with infrastructure to cater to healthcare services, there are still healthcare facilities with inadequate infrastructure in eThekwini Municipality, KwaZulu-Natal Province, South Africa, to provide comprehensive healthcare services. This study investigates the perceptions of healthcare workers and patients about the impact of health facility infrastructure on the provision of healthcare services in KwaZulu-Natal.

Objectives: This study aims to determine the perception of healthcare workers and patients about the impact of health facility infrastructure on healthcare services at Goodwins Clinic in eThekwini Municipality, KwaZulu-Natal, South Africa.

Method: This qualitative study applied a phenomenological design by conducting in-depth interviews with individual patients ($n = 20$) and healthcare workers ($n = 10$) purposively selected in 2022. Data were analysed using Colaizzi's phenomenological analysis framework.

Results: Participants reported that health facility infrastructure affects healthcare services. Furthermore, old facility structures, scattered structures and limited working spaces were found to be the leading factors affecting healthcare services in the facility.

Conclusion: The facility's structural design factors need to be considered to ensure that the health facility structure is adequate to deliver healthcare services and motivate radical transformation in measuring and managing healthcare facilities.

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Perception; health infrastructure; health service delivery; patients; healthcare workers; health facility

Introduction

Health facility infrastructure is the key pillar in health systems where the provision of healthcare services depends on it and supports the fundamental aim of promoting an improved standard of care and well-being for patients [1]. An overall description of health facility infrastructure includes the building structure and supporting elements such as equipment, access, information technology, systems and processes, sustainability initiatives and staff [1]. Therefore, a good health facility infrastructure should outline the following core principles: physical availability and physical quality of facilities, facility density and distribution, facility design, facility amenities and safety equipment, and precautions [2]. The type of health facility and healthcare services available in countries worldwide depends on factors such as the type of healthcare system in place, target population size, disease profile and the country's political state [3]. If the health facility fails to cater for the needs of healthcare provision, this can negatively affect systems and may constitute a threat to human survival [4]. The deterioration in health facility infrastructure has adversely affected healthcare delivery in African countries [5]. This has caused some to frequent spiritual houses for medical care, while others choose self-medication or expensive private hospitals with the hope of receiving adequate infrastructure and thus, better medical care [4].

Countries around the world have documented the association of health facility infrastructure and quality of healthcare, and there are still gaps in ensuring sufficient facility amenities, safety precautions, and equipment mostly in low-to-middle-income countries (LMIC) [2]. Countries such as Nigeria, for instance, have managed to investigate the state of Primary Healthcare Centre (PHC) facilities infrastructure in LMIC, where 59% of health facilities lacked reliable energy sources, 50% lacked piped water on the premises, and 33% lacked improved sanitation facilities [6]. The investigated countries have shown that only 2% of health facilities provide services such as water, sanitation, hygiene and waste management [6]. Inequalities in healthcare service coverage in urban versus rural settings have shown statistical significance in managing

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authorities, facility type and sub-national administrative units [6]. A study conducted on the accessibility of electricity at PHC facilities between 2001 and 2012 in 11 sub-Saharan African countries showed that 26% of these PHC facilities had no access to electricity, only 28% had reliable electricity, and 7% used only generators [7].

Looking at the South African context, health facilities and healthcare services depend on the two-way parallel system, which includes public and private healthcare [8]. However, this system can be affected by factors such as socioeconomic status [8], lack of infrastructure [9], limited healthcare staff [8], and financial mismanagement [8]. This system gives the country uneven healthcare services and health facility infrastructure across all provinces. Most of the middle-income class population can afford quality health care while the low-income population cannot. The percentage of the low-income population is much higher, which makes them dependent on government-owned healthcare facilities, which mainly comprise poor health structures. In addition, a study which made observations on 40 HCF in the Eastern Cape (EC) and KwaZulu-Natal (KZN) provinces of South Africa found the following to exist: safe drinking water (20–25%), electricity (45–85%), flush toilet (40% – 75%), and operational telephones (5–40%) [10]. This study also interviewed nursing professionals, and 80% in both provinces indicated that other indicators interfering with the quality of healthcare service delivery were basic resources and cultural practices [10].

Following the observations done in 2010 [10], another study conducted by Ritshidze [11] later in 2021 on the state of health in KZN found that 16% of monitored facilities in different districts were in bad condition, including eThekwini municipality facilities (19%). The most common reasons for poor conditions included old buildings with broken or cracked roofs, walls and floors [11]. The other concerns found included no light/or no working lights in some areas of the facilities, broken furniture, no running water, broken windows or doors, and rubbish piles [11]. Although these studies have reported poor facility infrastructure, there are few or no findings on the effect of health facility infrastructure on service delivery in SA. To ensure all populations have timely access to healthcare requires sufficient facility infrastructure, geographic accessibility, and determination of the most common problems within the community [12]. The target investigated clinic was among the 12 health facilities found to have poor infrastructure, poor service delivery and poor working conditions [11]. Therefore, this study decided to investigate the perception of healthcare workers and patients about the impact of health facility infrastructure on the provision of healthcare services at Goodwins Clinic in eThekwini Municipality, KwaZulu-Natal, South Africa.

Materials and methods

Study methods and design

A qualitative phenomenological design was used to determine the perception of healthcare workers and patients about the impact of health facility infrastructure on healthcare services at Goodwin's clinic in eThekwini Municipality, KZN. Phenomenology is a research approach that seeks to describe the essence of the phenomenon by exploring it from the perspective of participants' lived experiences [13].

Study setting

The Primary Healthcare Centre (PHC) in eThekwini Municipality, KZN province of South Africa, was targeted as the study setting. The municipality has different levels of health facilities, which includes 99 public PHCs, 8 community health centres, 3 district hospitals, 5 regional hospitals, 2 provincial tertiary hospitals, and 1 national central hospital. One public PHC facility, Goodwins in KwaMashu Township (E section), in eThekwini Metropolitan Municipality, shown in Figure 1, was randomly selected from the four facilities that had a high percentage of reported poor infrastructure, poor service delivery, and poor working conditions.

Study population

The study targeted two groups of participants for a broader understanding of the effect of health facility structure on healthcare services. The first participants were patients (Group 1) visiting the PHC for the second time, with no severe medical condition and who were literate and legally allowed to give consent. The second participants (Group 2) were healthcare workers working on a full-time basis for two months at the target PHC. The following inclusion and exclusion criteria were used to ensure the proper selection of the target population:

Inclusion criteria

- Patient and health care workers who signed consent forms
- Patients attending Goodwins Clinic for the second time
- Healthcare workers working/stationed at Goodwins Clinic for more than two months
- Patients and healthcare workers who were 18 years and older
- Illiterate patients (these participants will be assisted by researchers).

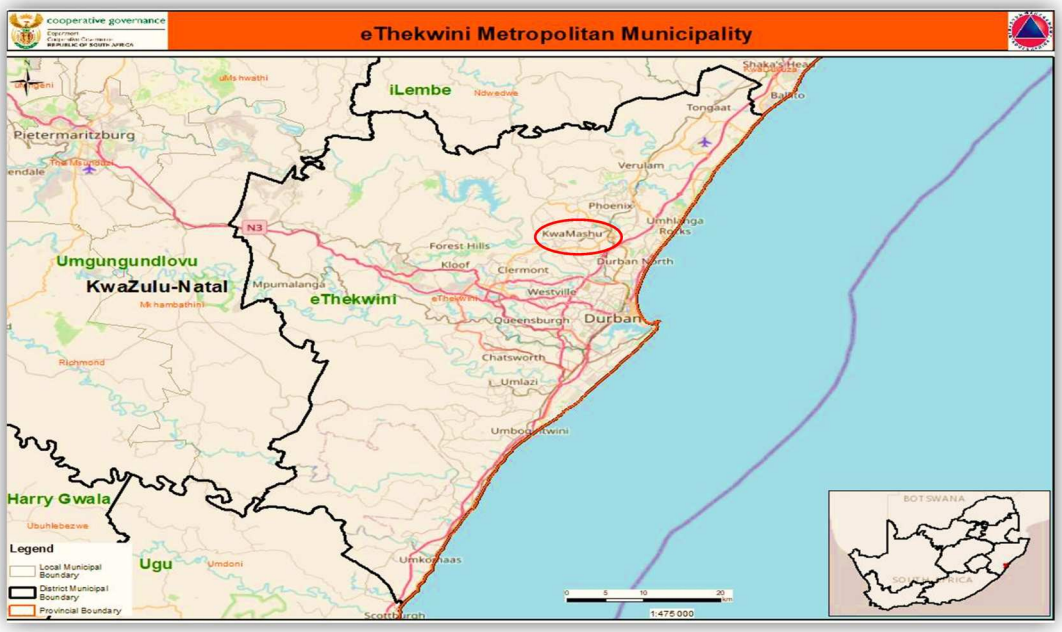

Figure 1. eThekwini Metropolitan municipality map showing Kwamashu Location [25].
Note: Study location indicated by red circle.

Exclusion criteria

- Patients and health workers who refused to sign the consent form
- First-time patients attending Goodwins Clinic on the day of data collection
- Visiting healthcare workers at Goodwins Clinic
- Patients who did not understand isiZulu and English
- Minor patients
- Patients who are critically ill
- Healthcare workers who are off duty on the day of data collection.

Study sampling strategy

Purposive sampling was used to select healthcare workers and patients. After the study received KZN Provincial and District approval, the researcher obtained a clinic daily roster from the PHC manager and selected every fifth person on the roster. The total number obtained amounted to ten healthcare workers. The selected participants were personally informed a week after the main staff meeting before data collection, and they confirmed their availability. Thereafter, the details about the study were shared with them. In total 10 healthcare workers and 20 patients were interviewed.

Data collection

The study received statistical and University of Pretoria Faculty of Health Sciences Research ethics approval (**Ethics no.** 278/2022). Thereafter, data was physically collected during clinic operating hours (07h30–16h00) within two months. All participants preferred to use isiZulu as the language of communication; thus, data was collected using the preferred language. After agreeing to participate in the study, participants signed the consent forms and received the study information sheet. The data collection method was interviews, and two types of data collection tools were used: the interview guide and an audio recorder. Two separate adopted interview guides named QA for Group 1 and QB for Group 2 were used. Both interview guides were developed using the *Primary Healthcare Performance Initiative Guide: An Improvement Strategies mode* [2]. The guides were also translated using a language translator and verified by a Zulu language-speaking person. These guides were structured into two parts, which were demographic information and participant interviews. Questions designed for participant interview sections were open- and closed-ended questions. During data collection, the researcher also took into consideration non-verbal communication. Participants were allowed to express their thoughts freely and were listened to respectfully. All audio-recorded information was transcribed verbatim, and each day after data collection, the collected information was iteratively analysed until a point of data saturation was reached [14,15].

Measurements

The effect of health facility infrastructure on healthcare service delivery is presented as the main outcome of the study. Both groups of study participants were asked to describe how the infrastructure of the facility

affects the quality of the services provided in the clinic, and the responses to the options were based on their perceptions. The description of health facility infrastructure was treated as a dependent variable and healthcare service delivery as an independent variable. Both study participants' ratings of the level of healthcare services provided in the clinic were ordinal variables with optional responses such as excellent, very good, fair, poor, and others. Furthermore, both participants were asked how satisfied (satisfied, not satisfied, and others) they were with the cleanliness of the physical environment (e.g. waiting area, toilets) of the clinic, the availability of drinking water, and the availability of adequate waiting area or seating arrangement. Demographic variables of healthcare workers were age category, department placed to work, occupation, gender, number of years working in the facility, type of employment contract (temporary or permanent), and level of education. Healthcare workers also described the types of problems they experienced when providing healthcare services, which were measured as staff negative attitude, poor management, discrimination, mistreatment, and others. The ability to access other medical and supporting equipment was also measured as always having access, not having access, restricted access, and other.

The patients' demographic variables were the participants' used language (if illiterate, please specify), name of department found, employment status, age, gender, and highest level of education. These participants were asked to rate the effectiveness of treatment and formation provided at the clinic (Excellent, Good and Fair); explanation given with regards to the treatment plan (Excellent, Good and Fair); the level at which given medicine and their side effects were explained (Excellent, Good and Fair), their satisfaction on the healthcare workers' explanation of the purpose and necessity of any tests to be done (Excellent, Good and Fair); and the level of helpfulness and responsiveness of the staff at the clinic (Excellent, Very good, Good, Fair and Poor). The distance it takes patients to come to the clinic was also determined by using estimated time of less than 15, 15–30, 30–45 min, and more than 45 min. Patients were also asked to describe the types of problems they encountered when accessing healthcare services at Goodwins Clinic (Staff negative attitude, Prolonged waiting period/hours, Discrimination, Inequality, Provision of incorrect type of service, and Others).

Thematic analysis

The data obtained between September 2022 and October 2022 was filed separately for both groups in labelled files. Recorded audios were safely saved using participants' labels (e.g. HCW as QB, Participant 1 = QB1) and they were secured on a password-based file. The recorded data underwent transcription and was combined with each participant's answer sheet a day after data collection. The Zulu-speaking data collector translated the data into English. Following data collection, the seven steps of Colaizzi's thematic analysis framework [16] was implemented using NVIVO 14 to assist with coding.

First, the researcher went through all the transcripts to obtain a detailed understanding of each healthcare worker and patients' perceptions. Following the first step, all significant statements were extracted from the read transcripts, and these were further analysed for code allocation using NVIVO. Third, the meaning of each significant statement was determined. Fourth, a cluster of themes was created from these statements. Fifth, the study results were integrated into a detailed representation of the perception of healthcare workers and patients on the effect of health facility infrastructure on healthcare services. Sixth, the perception of the effect of facility infrastructure on healthcare services was divided into superordinate themes, themes and subthemes. Lastly, the collected data was verified by comparing the audio and written raw data, as well as a spreadsheet with developed themes.

Table 1. Analysis codes and their definitions.

Codes	Code definitions
Health facility infrastructure description	Any description of health facility structure including each department in the facility, the whole facility structure, building structure, roof, ceiling, materials, doors, windows, and support equipment used on a daily basis to provide healthcare services.
Impact of facility infrastructure on healthcare services	Any or every facility infrastructure that will impact the provision of healthcare services.

Study results

The study findings are summarised into three tables which are analysis codes and their definitions (Table 1), demographic characteristics of respondents (Tables 2, 3), and formulated themes (Table 4).

Analysed codes and definitions

Participants characteristics

Table two and three illustrates the health care workers (HCWs) and demographic characteristics of participants who participated in the study.

Themes

Table 4 illustrates the overarching themes emanating from the thematic analyses of the participants'

Table 2. Demographic characteristics of health care workers.

Participant's code	Gender	Age	Education	Position	Number of years working	Employment status
Participant-QB1	Female	50	ND	ENA	16	Employed
Participant-QB2	Male	38	Diploma	EN	11m	Employed
Participant-QB3	Female	41	AC	LC	18	Employed
Participant-QB4	Female	34	Diploma	EN	2	Employed
Participant-QB5	Female	59	Bachelors	RPN	19	Employed
Participant-QB6	Female	47	Diploma	EN	16	Employed
Participant-QB7	Female	42	Bachelors	FIO	16	Employed
Participant-QB8	Male	34	NSC	LC	11	Employed
Participant-QB9	Male	42	NSC	Security	16	Employed
Participant-QB10	Female	47	Diploma	EN	2	Employed

Notes. AC: Advanced Certificate; EN: Enrolled Nurse; ENA: Enrolled Nursing Assistance; FIO: Facility Information Officer; ND: National Diploma; NSC: No Secondary School; RPN: Registered Professional Nurse.

Table 3. Demographic characteristics of patients.

Participant's code	Gender	Age	Education	Position	Number of years working	Employment status
Participant-QA1	Female	26	NSC	–	–	Employed
Participant-QA2	Male	27	NSC	–	–	Employed
Participant-QA3	Female	31	Grade 11	–	–	Unemployed
Participant-QA4	Male	26	NSC	–	–	Student
Participant-QA5	Female	40	NSC	–	–	Unemployed
Participant-QA6	Female	55	Grade 10	–	–	Unemployed
Participant-QA7	Female	26	NSC	–	–	Student
Participant-QA8	Female	47	Grade 11	–	–	Employed
Participant-QA9	Female	67	NE	–	–	Pensioner
Participant-QA10	Male	52	NSC	–	–	Employed
Participant-QA11	Male	48	Grade 6	–	–	Employed
Participant-QA12	Male	34	NSC	–	–	Employed
Participant-QA13	Male	31	NSC	–	–	Employed
Participant-QA14	Male	32	NSC	–	–	Employed
Participant-QA15	Female	55	Grade 5	–	–	Unemployed
Participant-QA16	Male	28	NSC	–	–	Employed
Participant-QA17	Female	36	Grade 11	–	–	Employed
Participant-QA18	Female	35	Grade 10	–	–	Self-employed
Participant-QA19	Male	32	NSC	–	–	Employed
Participant-QA20	Female	47	NSC	–	–	Unemployed

Note. ND: National Diploma; NSC: No Secondary School.

depicted experience on the impact of health facility infrastructure on service delivery. The responses were first grouped into themes, then emergent themes and finally, clusters of themes.

Table 4. Summary of formulated themes.

Overarching Theme	Main Themes	Subthemes
Health facility infrastructure description	Theme one: Departmental structure	1. Poor structure 2. Small space 3. Old clinic structure 4. Unhygienic 5. Good clinic infrastructure
	Theme two: Working and physical environment	1. Not safe 2. Limited space
Impact of facility infrastructure on healthcare services	Theme one: Poor service	1. Insufficient equipment 2. Shortage of medicine 3. Old facility structure
	Theme two: Insufficient service	1. Limited facility structure. 2. Unsafe structure
	Theme three: Disrupted service	3. Scattered facility structure

Overarching theme: Health facility infrastructure description

The study's findings revealed that departmental, working and physical structures were potential descriptors of the whole health facility infrastructure.

Theme one: Departmental structure

The study's results showed that participants who were patients and HCWs indicated poor structure, small space, old clinic structure, and unhygienic in their descriptions of the facility department's structure. A few patients who participated positively revealed that some departmental structures they visited had good infrastructure.

Subtheme: Poor structure

The findings indicated that the departmental structure was not good, i.e. substandard, which means that the facility structure might not be well structured:

> 'The waiting area is not good as it is outside; I am afraid that if it rains people will be wet'. [**Participant-QA2**]

> 'The toilets are clean, but the doors are not lockable which makes it not good and not private'. [**Participant-QA7**]

Other participants mentioned that due to the open top of the consultation rooms, they felt like their information could be heard by everyone, compromising safety and confidentiality:

> 'The consultation rooms are not closed on top, so everyone can hear when the nurse is talking to you'. [**Participant-QA20**]

Subtheme: Small space

Participants indicated that the facility departments had small or limited space:

> 'Feels like the toilets are too small and consultations rooms, they need the extension'. [**Participant-QA4**]

The study further revealed that the facility had too many compartments or sections:

> 'The structure is not good; there are too many sections'. [**Participant-QA13**]

Subtheme: Old clinic structure

Based on the study's findings, one of the main problems with the facility structure was that it was old:

> 'Other parts of the clinic structure are ok, but most parts are old and not good'. [**Participant-QA17**]

> 'The clinic structure is old'. [**Participant-QA9**]

Subtheme: Unhygienic

The study's findings showed that the facility departments were unhygienic:

> 'As a person working with contagious diseases, such as COVID-19, I have to go to the other section to wash my hands after seeing a patient, which is a bit of a distance'. [**Participant-QB10**]

> 'We do not have water near our working station, which makes it unhygienic, and sometimes we use toilet water'. [**Participant-QB9**]

Subtheme: Good clinic infrastructure

The study also found that some of the facility departments had good structure:

> 'One part of the clinic infrastructure is good, especially the newly built structure'. [**Participant-QA6**]

Theme two: Working and physical environment

The study revealed that the working and physical environment had the same descriptions as the departmental structure. These descriptions were only provided by the HCWs, who mentioned that the working and physical environment was not safe and had limited space.

Subtheme: Not safe

The study's results indicated that the working and physical environment was not safe:

> 'The working environment is not safe'. [**Participant-QB7**]

> 'There is a big hole in my office, which can cause you to fall. It once trip one nurse and she got injured'. [**Participant-QB5**]

Subtheme: Limited space

The study revealed that the working environment and physical environment had limited space:

> 'There is limited space and only two toilets used by patients'. [**Participant-QB9**]

Overarching theme: Impact of facility infrastructure on healthcare services

The study's findings indicated how patients and HCWs described the impact of facility infrastructure on healthcare services. The impact of health infrastructure caused poor service delivery, insufficient service and disrupted service delivery.

Theme one: Poor services

The study's findings revealed how facility infrastructure affects healthcare services. These indicated that insufficient equipment, shortage of medicine and old facilities caused poor services.

Subtheme: Insufficient equipment

The study revealed that participants had perceptions of the effect of facility infrastructure on the healthcare services that were provided. They perceived that the lack of equipment did cause poor service provision in the clinic, which indicated the relationship between the facility's infrastructure and healthcare services. This is revealed in the following statement:

> 'There is no equipment that I need to work; I bought my laptop and data to use them for work purposes, the chairs are not comfortable and there is no ventilation. This makes me not to provide the right health services'. [**Participant-QB7**]

Subtheme: Shortage of medication

The study's participants had perceptions of the effect of facility infrastructure on the healthcare services that were provided. They indicated that the shortage of medication meant they could not provide full services. This indicated the relationship between the

facility's infrastructure and healthcare services as depicted in the following statement:

> 'There is always a shortage of medication, which makes us not provide full service'. **[Participant-QB1]**

Subtheme: Old facility structure

According to the study's findings, old facility structure poorly affected the provided healthcare services:

> 'The facility's main building is too old, there are too many containers, which makes the service not well provided'. **[Participant-QB9]**

Theme two: Insufficient service

According to the study's findings, the participants disclosed that limited facility space and unsafe structure resulted in insufficient healthcare service in the facility:

Subtheme: Limited facility structure

The limited space was described as one of the causes of insufficient healthcare services, as the following statement indicates:

> 'Limited space and structure not good to provide other services'. **[Participant-QB2]**

Subtheme: Unsafe structure

Some of the participants in the study revealed that the unsafe structure compromised the healthcare services to be provided, for instance:

> 'One day, the ceiling board fell a minute after I walked out of the department, which was so scary; there are also too many holes around the clinic which can injure patients and HCW will lead to staff shortage while affecting the level of service'. **[Participant-QB5]**

Theme three: Disrupted service

Subtheme: Scattered facility structure

Scattered facility structures were shown to disrupt the healthcare service. Some participants also indicated that having scattered facility structure affected the provided healthcare service:

> 'The infrastructure of the facility is scattered wherein you must go far to collect things to work, which makes patients wait for a longer time'. **[Participant-B8]**

> 'Too many sections can make you end up not getting the service that you want'. **[Participant-QA13]**

> 'The structure is not good and well arranged, and some people are thinking of going to the other clinic'. **[Partcipant-QA14]**

Discussion

The study's findings showed that health facility infrastructure affects healthcare services that are provided in the target study settings. The facility infrastructure and the support equipment were among the factors which affected healthcare services. These findings agreed with the study conducted in Nigeria on mistrust of health system, which indicated that participants had mistrust on infrastructure in the Nigerian health system [17]. This mistrust of infrastructure is 'linked to a jeopardized educational system, low morale of health workers due to poor remuneration, lack of professionalism among health workers, misinterpretation of laboratory investigation results leading to misdiagnosis, dilapidated medical equipment, unavailability of ambulances, inaccessibility to essential services, shortage of health workers, absence of patient-centered care, and poor healthcare financing' [17]. In addition, a report by the South African Human Rights Commission [18] revealed that the physical structure of health facilities is overcrowded, leading to compromised quality of healthcare service due to lack of privacy, poor cleanliness, and outdated technology, and the workload has increased shift work, which causes long working hours. The high probability of dying in public health facilities was also found to be affected by hospital infrastructure and quality of service [18]. Furthermore, the current study showed the relationship between the health facility infrastructure and healthcare service, revealing that insufficient equipment, limited facility space, unsafe structures and old facilities affected the level of healthcare service provided. Notably, the current study's findings concur with the study conducted to investigate the impact of the technological infrastructure of the quality of health services in the Nigerian health sector. The Nigerian study's results indicated that the impact of staff/infrastructure inadequacy on quality of service shows statistically significant relationships ($p < 0.05$) with gross mismatch of patients and healthcare workers [4]. These results showed a significant impact of infrastructure on the quality of healthcare service [4].

In addition, the Office of Health Standards Compliance (OHSC) issued an annual inspection report aimed at determining whether health establishments complied with prescribed norms and standards [19]. This report covered four functional areas around the maintenance of health infrastructure. Among the litany of adverse findings, the outstanding outcomes included the non-existence of maintenance plans for most facilities across the eight audited SA provinces [19]. In addition, adverse outcomes related to the maintenance of buildings, equipment, and vehicles were outlined in this report [19]. Ultimately, Manyisa and van Aswegen [20] further showed that poor health

facility infrastructure, inadequate resources and staff shortage were the major factors contributing to poor working conditions.

Service delivery is linked with all other elements in the health system [21]. The availability of resources, such as qualified staff and effective organisation of their skills determines the possibilities for service provision studies [21]. In most countries, the government takes responsibility for determining the optimal models for delivering different health services to the public and steers and motivates providers to behave accordingly. A cross-sectional study assessing patients' perception of quality nursing care and services in an emergency department in Jordan found that there was a high level of patients' perception of quality nursing care and related emergency department services [22]. Al-Saidat et al's [22] study looked at both private and public health facilities and reported low quality of health service in the public sector, which correlates with the current study's findings, whereby the healthcare service was rated as poor by 15% and 20% of patients and HCWs, respectively. Despite these ratings, positive feedback was recorded by both patients and HCWs in the current study. In addition, another study that evaluated the level of satisfaction of patients hospitalised at Ibn Al Jazzar University Hospital in Kairouan in 2018 [23] supported our findings of poor healthcare services. The study's results reported that patient satisfaction was low regarding the quality of the services provided, mostly in the areas related to the conditions of stay and the globality of care [23].

Health facility infrastructure constitutes a major component of the structural quality of a health system [24–26], and is one of the reasons that enables the rendering of health services. Health facility infrastructure in many countries differs depending on the government's support. The current study described health facility infrastructure by looking at how each department is structured and the work and the physical environment. This study's results described the departmental structure as insecure, old and unhygienic, with limited space and also with good structure. Some descriptions were the same as the ones for the work and physical environment (insecure and limited space). These were similar to a rapid assessment conducted in Tanzanian OHCs, which covered seven PHCs ranging from a dispensary to a district hospital [27]. This rapid assessment encompassed the facilities as entities, as well as 42 facility buildings and 80 pieces of technical medical equipment [27]. A complete and rapid assessment of facility infrastructure was undertaken by healthcare professionals and facility staff and the results revealed serious infrastructural deficiencies [27]. However, no interviews were conducted during these rapid assessments to explain the study's aim.

In addition, another study, which looked at the perceptions of HCWs on facility infrastructure in an East Ethiopian hospital, reported that 59.3% of the respondents perceived that their hospital did not place enough emphasis on the quality of service provided, and 69.6% reported that there were inadequate facilities [19]. In addition, a study conducted to investigate the impact of technological infrastructure on the quality of service in Nigerian health sectors reported inadequacy of human resources and utilities and extremely inadequate laboratory equipment [4]. Moreover, a study exploring quality standards implementation at South African municipality's health facilities reported that the interviewed participants observed dilapidated infrastructures in the target health facilities which contributed to the noncompliance with quality standards [24].

Furthermore, patients' perceptions also showed a gross inadequacy of human resources, with a mean of 1.94, 1.88, 1.65, and 1.50 for doctors, nurses, ward aids, and laboratory staff, respectively, with laboratory staff being the most inadequate, similar to the perception of the hospital workers [4]. These results concur with a monitoring report conducted by Ritshidze [11] on the state of health in KZN. This report found that 16% of monitored facilities in different districts were in poor condition [11], which agrees with the current study findings. The most common provided reasons for poor conditions were old buildings (64%) and broken or cracked roofs, walls, and floors (36%) [11]. Other concerns found included no lights/no working lights in some areas of the facility, broken furniture, no running water, broken windows or doors, and rubbish piles [11]. Ultimately, the current study showed how the health facility infrastructure impacted healthcare services. Health facility infrastructure remains one of the core skeleton pieces of the health systems; thus, if health facilities are not well structured and customised to provide public health service, this can lead to a negative strain on the health system, an increase in double burden diseases, an increase in mortality, and a negative impact in human resources (HCWs).

Study limitations

The current study was limited to one KwaZulu-Natal municipality, the eThekwini Municipality. The study included only two types of participants to gain a broader understanding of the effect of health facility structure on healthcare services. The first participants were patients who were only visiting the PHC for the second time onwards, with no medical condition severity, who were literate, and who were legally allowed to give consent. The second participants were healthcare workers who had been working full-time at the target PHC for over two months. Data

was collected from participants willing to participate in the study and signed a consent form. The study's findings were based on healthcare workers and patients; however, the perceptions of facility managers and other non-governmental organisations' which were supporting the facility was missing in the study. These limitations should be borne in mind when interpreting the explored perceptions in this study.

Study implications and recommendations

The current study has practical and theoretical implications. The practical implication of this study is that the obtained results will assist the government in allocating more funds to improve health facility infrastructure in KZN and other provinces. This funding increase can help improve healthcare services and reduce the incidence of morbidity and mortality caused by poor healthcare services. The results will help to motivate a review of the current health infrastructure guidelines and policies, including their evaluations and monitoring. Further value will be added by assisting health facilities in being well-prepared structurally for the implementation of the proposed National Health Insurance (NHI) and execution of the National Infrastructure Plan by 2050. Few studies conducted in SA examine patients' and HCWs' perceptions of health facility infrastructure and service delivery; the only studies close to the current study are reports and assessments [1, 2]. This means the data obtained from this study will provide theoretical aspects to the existing studies, as well as the conceptual framework addressing the impact of health facility infrastructure on service delivery.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

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