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A review of occupational therapy services within an acute public tertiary hospital in KwaZulu-Natal, South Africa

ABSTRACT**Introduction:** The provision of occupational therapy services in providing a minimum essential service in public health institutions in South Africa are currently guided by a quality control measure by the National Department of Health.**Aim:** To review the occupational therapy services in an acute, public tertiary hospital from 2015–2019 and to compare this with the expectations of these services in a tertiary hospital to identify potential gaps in service delivery.**Method:** A single site, retrospective quantitative audit from 2015–2019 was completed at one tertiary hospital. Patient-related and occupational therapy service data were included. 18579 patient entries were captured. The analysis included descriptive and inferential statistics of mean, standard deviations, frequency tables, percentages, and ANOVA.**Results:** Findings indicated a consistent decline in the mean values of, the number of therapists attending to patients, number of patients, assistive devices issued, total time of patient units and consultations, total time spent on ward rounds, clinics, and meeting attendance. The number of student therapists attending to patients, splints, pressure garments and issued wheelchairs showed an increase in trend across the reviewed years.**Conclusion:** Inadequate human resources and budget systems are potential gaps in occupational therapy service delivery in an acute public tertiary hospital.

INTRODUCTION

The provision of occupational therapy services in public health institutions in South Africa is currently guided by the National Core Standards, which is a quality control measure implemented by the National Department of Health (NDOH)¹. These activities are considered critical in providing a minimum standard of essential service¹. Human resources, infrastructure, and essential equipment, among other criteria, are highlighted as minimum standards to deliver a service². High-quality, cost-effective rehabilitation services are of paramount importance in providing positive outcomes for the recipients of the services³.

In South Africa, the restructuring of the health system in South Africa is anticipated through the impending introduction of a National Health Insurance Scheme (NHI) aims to include access to quality healthcare whilst minimising financial risk. Documenting a comprehensive situational analysis of service delivery will provide evidence on providing appropriate quality and quantity of occupational therapy services in line with the standards set by national health programmes⁴. However, there are limited documented reviews on occupational therapy services for the various hospital levels in the KwaZulu-Natal (KZN) province. This study aims to review the services rendered in the occupational therapy department of a designated acute public tertiary hospital from 2015 to 2019 and to identify potential gaps in service delivery.

The Occupational Therapy Practice Framework IV (OTPF): domain and process⁵ was used as a framework for this study. The framework articulates the oc-

cupational therapy contribution to promoting the health and participation of persons, groups, and populations through engagement in occupation⁵. With reference to the OTPF, a healthcare organisation is a diverse system influenced by various factors such as performance patterns and skills of human resources, the context of the healthcare setting⁵.

LITERATURE REVIEW

The South African Health Care System

South Africa has an estimated population of 54956900⁷, most of whom access health services through public sector clinics and hospitals. Public health services are divided into primary, secondary, and tertiary and further categorised into district, regional, tertiary, central and specialised institutions to allow an efficient drainage system of the population accessing health services⁸. Currently, the expenditures in both private and public sectors are approximately equivalent and, in combination, total 8.5% of gross domestic product (GDP). The private sector serves 16% of the population, while the public sector serves 84%⁹.

Due to the two-tiered private-public contrast in health-care delivery and the healthcare staffing crises, access to quality and adequate occupational therapy services are limitations confounding persons with disabilities (PWD) living in South Africa¹⁰. High-quality, cost-effective therapy and rehabilitation services are of paramount importance in providing positive outcomes for the recipients of the services³. These services including occupational therapy services are audited to ensure that they meet the compliance standards of the NDOH¹¹.

Rehabilitation Services

Access to appropriate rehabilitation services influences the possibility of and the ability of PWD to lead an economically independent life and actively participate in society¹². In South Africa, hospital-based rehabilitation services are aligned with medical services prescribed by regulation for different hospital categories. However, it is noted that the scarcity of appropriate rehabilitation impairs the quality and type of service, as there is little to no proof of effective service delivery, which could be used to motivate for resources. Limited research has been conducted regarding the outcomes of rehabilitation services at secondary, tertiary, and specialised levels¹³. There is an inequitable distribution and high vacancy rate of rehabilitation service providers at the different levels of care¹³. In addition to the need for healthcare service providers, the NDOH, KZN has instated a moratorium on allied health posts since 2016, which has significantly impacted rehabilitation services and human resources, particularly in occupational therapy¹⁴.

Access to appropriate and affordable assistive devices and technology (mobility, communication, and daily living) which allow PWD to participate equally in society are also evident

within the KZN public health system. These challenges are associated with constrained budgets, poor access, ineffective referral systems and poor knowledge of the prescription and issuing of assistive devices and technology¹⁴. Without access to these devices, person(s) with disabilities, face unsafe discharge or endure prolonged periods of hospitalisation. They remain dependent on institutions providing services and continue to experience difficulties securing rights to education and employment¹².

Occupational therapy in tertiary hospitals

Occupational therapy has been noted as the only spending category that has been shown to reduce hospital readmissions¹⁵, length of stay and successful transition and discharge¹⁶ with the implications of patient flow influencing patient outcomes, staff performance and costs¹⁷. KwaZulu-Natal has four tertiary hospitals supporting 45 district hospitals, and 14 regional hospitals within 11 health districts, with a total of 75 therapists distributed amongst all its hospitals servicing a population of just over 11 million people¹⁴. Thus, occupational therapy intervention at a tertiary hospital is essential for optimal patient functioning and turnover and reducing the burden on the tertiary facility¹⁴, since most KZN district hospitals are not fully equipped with transport, health-care related services, occupational therapy personnel and resources.

A skill set for acute, tertiary care is crucial for successful tertiary occupational therapy services. Currently, in South Africa, there are no documented skills and knowledge sets to define the role of occupational therapy in an acute, tertiary hospital. Furthermore, there are no speciality areas in occupational therapy recognised by the Health Professionals Council of South Africa (HPCSA), which are viewed as vital for tertiary care. Skills such as clinical reasoning, lateral thinking, time management, and further experience and support from senior therapists with specialised skills are also critical for rehabilitation services in an acute, tertiary hospital¹⁸.

Occupational therapy services in the designated acute public tertiary hospital

Human Resources

Disparities in occupational therapy human resource distribution negatively impact rehabilitation service provision and equitable health and rehabilitation outcomes¹⁹. According to the proposed organisation and post establishment for this study site, in 2018, the occupational therapy division should have ideally been staffed with 19 occupational therapy healthcare professionals²⁰. To curb expenditure, the moratorium on allied health posts by the NDOH, KZN (2016) indicates that no more than six posts were filled at this tertiary hospital¹⁴.

Budget Systems

Budget restrictions influenced by medical inflation and ex-

change rate fluctuation cascade through all levels of service delivery²¹. The cost-constrained economic environment does not prioritise equipment and assistive devices budgets, further impinging on services rendered²².

METHODS

This study involved a retrospective occupational therapy file audit over five years at a single site.

Setting

The location of the study is a public, acute tertiary hospital within Pietermaritzburg, uMgungundlovu district. This hospital is a referral hospital offering tertiary services to Area Two of KZN, which comprises the Western half of KZN. It includes the following five health districts: Harry Gwala, Amajuba, uMgungundlovu, uThukela, uMzinyathi, with a total population of 4.5 million⁶. This acute public tertiary hospital currently provides approximately 84% of the total recommended tertiary services. It is fully supported by all services (ICU, radiology, diagnostic, blood bank, laboratory, and other services)²³.

Sampling

All hard-copy statistical data forms over five years (2015–2019) from the occupational therapy department were included in the sample. Patient-related data and occupational therapy service data were reviewed. Outreach clinic statistics were excluded due to the single occasional outreach service, which did not directly affect the study site. The years 2015 to 2019 were selected as statistical data forms were deficient in significant variables before 2015. The year 2020 was excluded due to the effects of the COVID-19 pandemic.

Data Collection, Analysis, and Data Management

A phased approach was used in the overall management of data. The duration of data collection was approximately four months. Collated documents such as hard-copy statistical forms (inpatient, outpatient, monthly summary sheets) and hard-copy wheelchair records were reviewed. These documents were stored within the occupational therapy department and were accessible to the research team. A diagnostic profile category list was compiled with various specialities of surgical, medical, orthopaedics, paediatrics, and oncology; this list included several other diagnostic profiles that were inclusive of the above specialities. The principal author captured all the data and was acquainted with the numerical key-value system and diagnostic profile sub-category list. Workbooks were compiled for patient-related and occupational therapy service data using SPSS version 21 software²⁴. Raw data equivalent to temporal units were converted into time values (hours). The first author captured data for each variable according to the numerical key values in the SPSS system software. The values were inputted on a single-entry basis and organised monthly from January 2015 to December 2019. The data were then cleaned using SPSS software. *Phase 1:* Patient data were aggregated using SPSS software. Patient details such as hospital number, age, gender, patient status (in-patient or out-patient), patient demographics, sub-specialities and diagnostic profile categories, month vis-

ited, base hospital and district, were captured. A categorised diagnostic profile list was developed against the primary diagnoses into surgical, medical, orthopaedics, paediatrics and oncology. These variables were further analysed with descriptive statistics of mean, standard deviation, range, frequencies, and percentages.

Phase 2: Service data of occupational therapists were aggregated as cases per year from 2015 to 2019 and matched accordingly with the variables of (i) time spent on patients, meetings, and ward rounds, (ii) number of patient consultations and (iii) intervention rendered with regards to splints, pressure garments, wheelchairs, and assistive devices and technology.

Analysis also included mean values, standard deviation, and minimum and maximum values on a yearly basis. The statistical differences in the means of patient-related data and occupational therapy service data were evaluated using one-way analysis of variance (ANOVA) throughout the five years of the review with the significance level set at $p < 0.05$.

Ethical Considerations

Ethical approval was obtained from the University of KwaZulu-Natal (UKZN) Humanities and Social Sciences Research Ethics Committee HSSREC/00002364/2021. Ethical clearance was also obtained from the Department of Health (National Health Research and Knowledge Management) NHRD Ref. KZ_202006_033 to allow access to the public acute tertiary hospital. Informed consent was obtained from the chief executive officer of the hospital and the assistant director of the occupational therapy department.

Reliability and Validity

This study's reliability and validity were ensured by having a single user (principal author) input the data according to allocated numerical coding on the SPSS system software. Having one individual input the data ensured that data collection was formed from the same set of data sources, thereby ensuring consistency, reliability, and validity of data collection²⁵. De-identification was observed by allocating each patient a patient code and maintaining the anonymity of personal patient information such as name and surname. Data aggregation occurred by combining related variables to form occupational therapy service data and patient-related data categories. Further data aggregation occurred through descriptive statistics of mean, minimum and maximum values, and ranges of data.

RESULTS

A total of 18579 consecutive patient documentations occurring during 01 January 2015 and 31 December 2019 were reviewed. Of these 43.4% ($n=8069$) were out-patient consultations and 56.5% ($n=10503$) were in-patient occupational therapy treatment sessions.

Human resources: The range of occupational therapists providing services to patients at one point in time was between three to six occupational therapists and zero to four occupational therapy students (Table I, page 19).

Patient care: Patient population consisted of in-patients and out-patients. Monthly, an average of 316 patients received

Table I: Occupational therapy service data (2015-2019)

Occupational Therapy Service Data	Summation of January to December Data per year					
	2015	2016	2017	2018	2019	Total
Range of occupational therapists providing services to patients	4 - 5	5 - 6	3 - 5	4 - 6	4 - 5	3 - 6
Range of occupational therapy students providing services to patients	0 - 2	0 - 1	0 - 1	0 - 3	0 - 4	0 - 4
Total time unit ward rounds and clinics (hours)	315.0	435.5	257.0	201.25	128.75	1337.50
Total time unit meeting (hours)	266.5	342.3	292.8	186.7	107.8	1196.1
Total time of patient (in-patient & out-patient) units (hours)	4623.3	5059.3	4381.3	4722.0	3797.8	22583.70
Total number of patient consultations (in-patient & out-patient)	8347	8297	7634	7583	6176	38037
Total number of patients (in-patient and out-patient)	4058	4235	3650	3904	3167	19014

Table II: Splints, pressure garments, assistive devices, and wheelchairs

Splints, Pressure garments, Assistive devices, and Wheelchairs	Summation of January to December Data per year					
	2015	2016	2017	2018	2019	Total
Total number of splints fabricated (inpatient & outpatient)	593	615	654	672	546	3080
Total number of pressure garments fabricated (inpatient & outpatient)	336	274	330	266	347	1553
Total number of assistive devices issued to patients (inpatient & outpatient)	22	15	4	19	43	103
Total number wheelchairs issued to patients (inpatient & outpatient)	38	23	18	21	26	126

occupational therapy services, an average of 180 in-patients and 136 out-patients. Statistics indicate an increase in patient units in 2016 and 2018, while those from 2015 and 2016 indicated an increase in patient consults (inpatients and outpatients) (Table I, above).

Occupational therapy service data: Statistics indicate a steady decline in time spent on ward rounds, clinics, and meetings since 2017 (Table I, above).

Patient Diagnostic Profile: Of patients were referred, diagnostic data for 18488 was captured and 39.2% were found to have orthopaedic conditions such as upper limb fracture, spinal conditions, tendon, nerve injuries, hand sepsis, brachial plexus injuries, hands not otherwise specified (NOS), upper limb amputations and orthopaedic NOS. Over a quarter (26.2%) of patients were paediatric, with paediatric neurology NOS, prematurity, and cerebral palsy (CP) being the most common diagnosis. Surgical patients constituted 22.5% of the patient profile, with most referrals from plastics and reconstruction and burns units. Medical patients (9.3%) included cerebrovascular accidents (CVA), neurological conditions NOS and medical conditions NOS being the most common. A small percentage (2.7%) of the patient profile was oncology (See Figure 1, adjacent). The highest percentage of patients were from Northdale hospital (NDH) (14.9%), Edendale hospital (EDH) (3.2%), Church of Scotland hospital (COSH) (4.1%) and Greytown hospital (2.7%) respectively, and the health districts with the highest percentage of referrals include uMgungundlovu (19.4%), uMzinyathi (7.9%) and uThukela (4%) (Figure 1, adjacent).

Orthoses and Assistive devices and Technology

The results demonstrate a steady incline in the yearly average of splints fabricated (3080), wheelchairs issued (110),

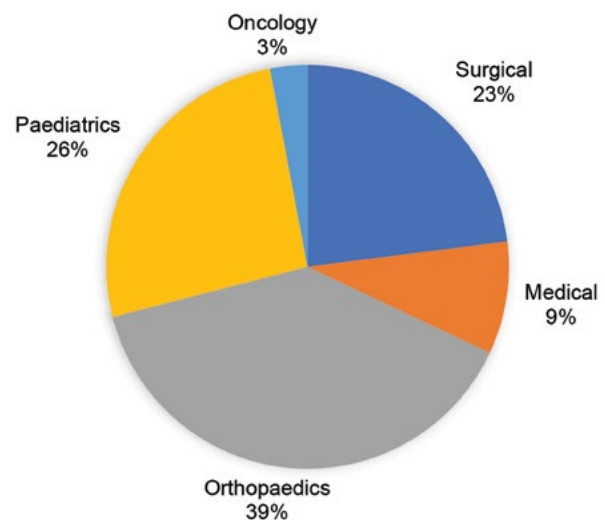


Figure 1. Patients' Diagnostic Profile (2015-2019) (n=18488).

pressure garments fabricated (1553), with a steady decline of assistive devices issued (119) for the period 2015 to 2019 (Table II, above).

During this review, a comparison between patient-related and occupational therapy service data was made to identify trends for the five years under review (Table III, page 20). The analysis reveals statistically significant differences in the number of occupational therapists providing services to patients, the yearly number of student therapists attending to patients, the number of patients, total time of patient units and consultations, total time spent on ward rounds, clinics and meeting attendance and the total number of assistive devices issued. However, fabricated splints, pressure garments, and issued wheelchairs were not statistically

Table III: Differences in patient-related and occupational therapy service occupational therapy service data (2015-2019)

Patient-related and occupational therapy service data	F= value	p value
Number of occupational therapists providing services to patients	4.963	0.002*
Number of occupational therapy students providing services to patients	14.177	0.000*
Total time of patient (inpatient & outpatient) units (hours)	4.144	0.005*
Total number of patient consultations (inpatient & outpatient)	3.820	0.008*
Total number of patients (inpatient and outpatient)	3.903	0.007*
Total time unit ward rounds and clinics (hours)	9.398	0.000*
Total time unit meeting (hours)	4.806	0.002*
Total number of splints fabricated (inpatient & outpatient)	1.053	0.388
Total number of pressure garments (PG) fabricated (inpatient & outpatient)	1.034	0.398
Total number of assistive devices (AD) issued to patients (inpatient & outpatient)	3.270	0.018*
Total number wheelchairs (WC) issued to patients (inpatient & outpatient)	0.206	0.934

*Significant at p<0.05

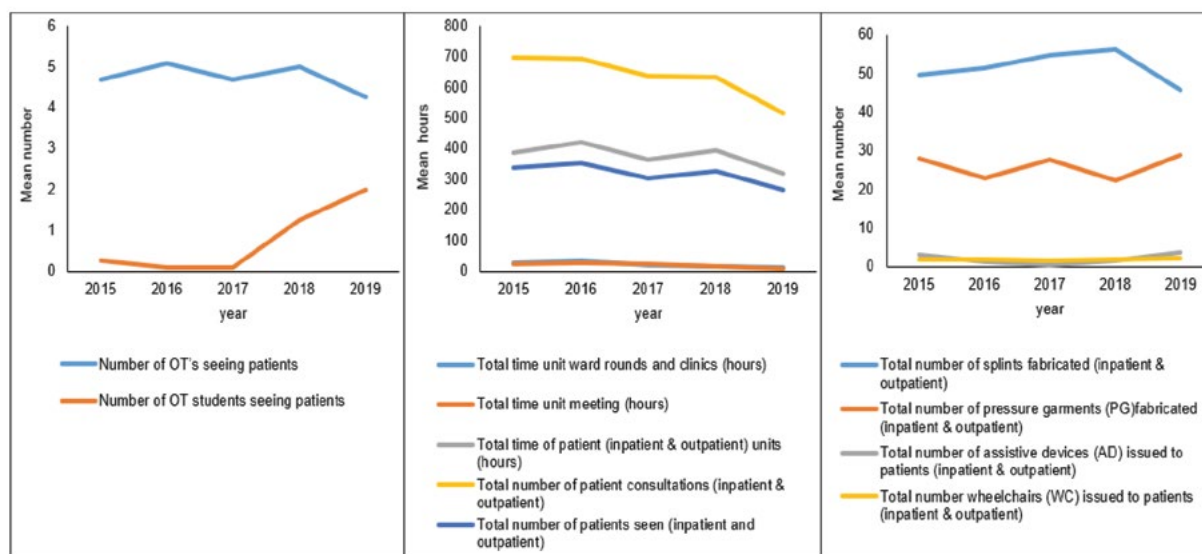


Figure 2. Monthly average of patient-related and occupational therapy service data (2015-2019).

significant across the reviewed years.

A cursory review of the yearly trends of the variables and further analysis revealed a consistent decline in the mean values of these variables from 2015 to 2019 except for variables such as the number of occupational therapy students, the number of splints, pressure garments fabricated, and wheelchairs issued. These variables portrayed an increasing yearly trend in their mean values in Figure 2, above

DISCUSSION AND IMPLICATIONS

This study reviewed the trends of services rendered by one occupational therapy department situated in a public, acute tertiary hospital in KZN and determined the potential gaps in service delivery. The implications from this study will guide the operational plans and services of the occupational therapy department at this public, acute tertiary hospital.

In terms of **human resources**, the occupational therapy services in KZN are widely spread, with the recommendation being one occupational therapist to 10000 head population²⁶. However, the study outcomes show an average of three to six occupational therapists is servicing a population of 4.5 million. Based on the World Federation of Occupational Therapy recommendation, 450 occupational therapists should service the given population, this further indicates

the paucity of employment of occupational therapists in KZN and a significant weakness in South African health systems is inadequate human resources²⁷. Only 31% (6/19) of posts were filled at any given time in this public, acute tertiary hospital. The moratorium on allied health posts in KZN since 2016 impacted recruitment.

Although the United Nations Convention for Person(s) with Disabilities (UNCRPD) (2006) outlined the necessity to meet global needs for Person(s) with Disabilities, with challenges being the inequitable distribution of rehabilitation workers²⁸ the moratorium inferred that rehabilitation posts could be sacrificed to save costs for patient care¹³. Occupational therapy posts remained on the essential health service list but with no prioritisation of these services, to date, occupational therapy human resources remain strained in KZN's public health system¹⁴.

In terms of **patient care (units and consults)**, a recommended service ratio ranges from one occupational therapist to 100 patients²⁹. This public, acute tertiary hospital has seen an average range of 363-1072 patient consults between three to six occupational therapists, indicating the patient care services are within and beyond the recommended service ratio range.

Concerning **occupational therapy service data**, administrative tasks, clinical tasks, and ward rounds are pivotal in

hospital-based care, enhancing the quality of care, improving communication; patient care and strengthening multi-professional training³⁰. This public, acute tertiary hospital demands that essential job duties include clinical work that encompasses ward rounds, clinic attendance, case studies, etc. and meetings to co-ordinate care. Statistics indicate a steady decline in time spent on ward rounds and clinic attendance since 2017, after which more time was spent on direct patient contact than meetings, ward rounds and clinic attendance. The OTPF indicate that healthcare contexts, performance patterns and skills of healthcare human resources directly influence occupational therapy service data⁵.

Considering **orthoses, assistive devices, and technology**, splinting maintains mobility, prevents the development of contractures, promotes the functionality of the limb, and assists with good cosmetic and functional results³¹. A widespread modality of scar and oedema management is utilising pressure garment therapy³². The number of fabricated splints, pressure garments or assistive devices issued is always a priority in using equipment and budget expenditure. Other variables may include the capacity at a base hospital to manufacture these items, availability of material and equipment and waiting times, and the diagnostic profile. There may be various contributing factors to fluctuations in splint design and construction, pressure garment design and fabrication and issue of assistive devices; in relation to the OTPF which include client factors of clients, performance patterns and skills of human resources and health care contexts⁵.

In terms of the **patient diagnostic profile**, occupational therapists are involved in rehabilitation programmes for orthopaedic, medical, neurological, and paediatric patients. Services range from provision of splinting, pressure therapy, activities of daily living (ADLs), training of activities mobilisation programmes, vocational rehabilitation, therapy and education, leisure management, home visits and adaptation of home environments³³. Concerning the OTPF intervention of client factors are directly influenced by healthcare contexts and performance skills and patterns of human resources⁵.

With reference to the **specific diagnostic intervention**, the following findings prevail:

- Occupational therapy role in Orthopaedics focuses on community resettlement, splinting and independence in ADLs³⁴. Based on the occupational therapy intervention, it can be assumed that most orthopaedic conditions require splinting, assistive device issues and rehabilitation.
- Occupational therapy intervention for Paediatrics promotes engagement and participation in daily life roles³⁵. Occupational therapy therapeutic intervention could involve rehabilitation, wheelchair or buggy provision and splinting.
- The role of occupational therapy in Surgical involves rehabilitation, oedema management, prevention of contractures and deformities through splinting, mobilisation, scar management and ADLs³¹. Based on the occupational therapy intervention, it can be assumed that most surgical and burn injuries will require splinting management or scar management.
- Occupational therapy in Medical is an imperative field of practice; neurological conditions affect performance

in ADLs. Occupational therapy attempts to diminish or compensate for cognitive, perceptual, or motor deficiencies³⁶. Occupational therapy intervention in neurological conditions could involve splinting and or assistive device issue and rehabilitation.

- Occupational therapy in Oncology is centred around supportive care and includes ADLs, lymphoedema, strength, range of motion, cognitive and perceptual intervention, pain management and palliative care³⁷. Occupational therapy intervention includes rehabilitation, assistive devices and technology, and wheelchair procurement. Oncology is the most underserved discipline in this public, acute tertiary hospital.

This public, acute tertiary hospital follows specific referral channels⁶. The highest percentage of patients are from Northdale hospital (NDH) (14.9%), Edendale Hospital (EDH) (3.2%), Church of Scotland hospital (COSH) (4.1%) and Greytown hospital (2.7%). The health districts with the highest percentage of service include uMgungundlovu and uMzinyathi and uThukela indicating that these three districts are supported more than the other two districts. Several outpatient statistical forms were incomplete for base hospital entries, and therefore, a conclusive percentage was unable to be achieved for patient profile demographics.

The recommendations from this study include, policy and protocol review and implementation to guide the specific services within an acute public tertiary hospital, a further diagnostic classification category system to guide specific diagnostic profile categories, departmental influence to ensure proper documentation of statistics and further studies occupational therapy best practice guidelines that are contextually appropriate to various healthcare institutions.

Limitations of the study

Hard copies of statistical forms were consulted thus, illegible handwriting influenced data collection. Several statistical entries were incomplete for demographics, gender, and diagnostic profile categories, therefore, influencing patient-related data. Furthermore, wheelchair statistics were incorrectly recorded on the statistical forms, thus influencing assistive devices and technology data. Not all diagnostic profile categories have been included in the diagnostic profile list thus limiting and containing the diagnostic profile category for this study.

CONCLUSION

Challenges facing the healthcare system in South Africa are unequal distribution of resources, and slow progress in restructuring the healthcare system, including strategies adopted by the government to improve the quality of healthcare delivery²⁷. The study results affirm the inter-relatedness of the occupational therapy practice framework domains of occupations, contexts, performance patterns and skills and client factors⁵. A tertiary hospital demands expertise and appropriate resources to provide an effective and efficient service. Based on the trends demonstrated in this study, it can be assumed that human resources and budget systems will define the next decade within the occupational therapy department as these directly affect the occupations, per-

formance patterns and skills of human resources in this field of practice and ultimately the intervention and outcomes of the healthcare system. A possible influencing variable may be the lack of knowledge about occupational therapy service delivery hence the moratorium on posts. Another influencing factor may be the channelling of an already constrained budget. Representation and participation in management evaluations, interventions and processes could improve the intervention and outcomes in a public, acute tertiary hospital. Innovation and pathway referrals remain some of the solutions to constraints in an acute public tertiary hospital.

Author contributions

Prashika Ghela completed this study towards a master's degree in occupational therapy degree and was responsible for the conceptualisation of the study, data collection, analysis and drafting of the original manuscript. Pragashnie Govender and Michael Olgunlana were supervisors of the study and guided the process from conceptualisation and design of the study to drafting and revision of the manuscript. All authors approved the manuscript for publication.

Conflicts of interests

The authors have no conflicts of interests to declare.

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