Rehabilitation outcomes measurement instruments usage in KwaZulu-Natal and Gauteng healthcare

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Thesis presented in partial fulfilment for the degree of Master of Management (in the field of Governance-Public and Development Sector Monitoring and Evaluation) to the Faculty of Commerce, Law, and Management, University of the Witwatersrand.

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DECLARATION

I **Mnqobi Basil Buthelezi** [Student no:2011325] declare that this thesis/dissertation titled 'Evaluating rehabilitation outcomes measuring data instruments usage across rural KwaZulu-Natal, urban Gauteng public-private healthcare' is my own, unaided work. I have acknowledged and referenced all sources that I have used and quoted. I hereby submit it in partial fulfilment of the requirements for the degree of Master of Management (in the field of Governance-Public and Development Sector Monitoring and Evaluation) at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.

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Mnqobi Buthelezi

15 November , 2022, at Johannesburg

Supervisor : Caitlin Blaser Mapitsa

DEDICATION

I dedicate this research to:

Thembeni Norah Buthelezi and Ndabayakhe Lenard Buthelezi my parents, who gave me the opportunity to live and told me that everything is in my hands, haven must be rich with you, I miss you.

Thando my fiancé, who believed in me throughout with patience and encouragement. I love you.

Nkanyezi and Sengamelwe my daughters, I want to say to you 'Roots of education are bitter, but fruits of education are sweeter'.

Nathy-Russia Sibiya, you've been always on line to call and find out how I was copying, ngiyabonga mfwethu, ngiyabonga Sotobe!

Ms Dudu Dube, **Mr Maxwell Luthuli**, **Mrs Xoli Ralasi** , and **MUSIC**, you were my support system. I thank you sincerely.

Lastly and importantly to my supervisor**, Dr. Caitlin Blaser Mapitsa**, accept my endless appreciation for taking me by hand, step-by-step in the journey of my professional development. Thank you for taking me in and mentoring me.

THE ABSTRACT

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Thesis Tittle: Rehabilitation outcomes measurement instruments usage in KwaZulu-Natal and Gauteng healthcare

There is a lack of rehabilitation outcome data collection and use in South Africa. Important to note in this study discussion are Rehabilitation Outcome Measures which are tools (FIM, BI, MRS, FAI, NEADL) used to collect data and measure the extent of change during and post-rehabilitation period. This research purpose aims to evaluate the awareness, and use of rehabilitation outcome data measuring instruments, the available capacity, opportunities of learning and constraints that exist across different settings in public and private rehabilitation healthcare in KZN and GP.

A quantitative research strategy was utilised. A cross-sectional, survey design plan of data collection framework was used. Face-to-face primary data collection was conducted in the proposed research sites. Purposive sampling targeting 13 rehabilitation public-private healthcare facilities in KZN, and GP was used. Stratified sampling together with 100% sampling in a small population was conducted. Community of Rehabilitation Multidisciplinary Teams (RMTs) of seven (7) members in public and private hospitals, composed of medical officer(s), nurse(s), clinical psychologist(s), physiotherapist(s), occupational therapist(s), speech/audio therapist(s) and social worker(s) took part in the study. SPSS assisted in results analysis; frequencies and non-parametric Chi-square of independence statistics were utilised to sort any significant associations.

Results indicated that 253 subjects participated in the study. Analysed results suggested that n=153 (60.5%) participants were not provided with rehabilitation outcome measuring tools by the facility they were working for. Results suggested a significant negative association in Public Rural Settings (FIM=49.7%, BI=43.8%, MRS=41.9%, p=0.001, FAI=17.6%, $p=0.037$) and Public Urban Settings (FIM=43.2%, BI=36.5%, MRS=40.5%, p=0.001 and FAI=35.3%, $p=0.037$) of public healthcare facilities as they were not using rehabilitation OMs. A significant association in use of rehabilitation OMs was found in Private Urban Rehabilitation Healthcare facilities (FIM=56.0%, BI=35.6%, MRS=64.5%, p=0.001 and FAI=47.1%, $p=0.037$). Public healthcare facilities in KZN and GP were not using rehabilitation outcome measures, while GP Private rehabilitation healthcare facilities were using them. In conclusion, it is recommended that National Rehabilitation Policy (NRP) is subjected to reviews to incorporate standardisation of rehabilitation OMs. A diagnostic evaluation exercise is necessary for Theory Of Change development focusing on rehabilitation healthcare services.

Key words: Rehabilitation Outcome Measures, Awareness, Use of Outcome Measures, Rehabilitation-Multidisciplinary-Teams, Data Instruments, Evidence, Rural, Urban, Private, Public, Monitoring & Evaluation.

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List of Abbreviations and Acronyms:

ADLs	Activities of Daily Living
ASIA	American Spinal Injury Association
BBS	Berg Balance Scaler
BI	Barthel Index
CBR	Community Based Rehabilitation
CLEAR AA	Centre for Learning on Evaluation and Results Anglophone Africa
CRPD	Convention on the Rights of Persons with Disability
DOH	Department of Health
DSD	Department of Social Development
ECD	Evaluation Capacity Development
FAI	Frenchy Activity Index
FAM	Functional Activity Measure
FDRG	Functioning and Disability Reference Group
FIM	Functional Independent Measure
FSDRS	Framework and Strategy for Disability and Rehabilitation Services
GDAP	Global Disability Action Plan
GP	Gauteng Province
HPCSA	Health Professional Council of South Africa
HRD	Human Resource Development
ICF	The International Classification of Function, Disability, and Health
KZN	KwaZulu-Natal
M&E	Monitoring and Evaluation
MARS	Modified Rankin Scale
MOCA	Montreal Cognitive Assessment
NDP	National Development Plan
NEADL	Nottingham Extended Activity of Daily Living Scale
NEC	National Evaluation Policy
NES	National Evaluation System
NHI	National Health Insurance
NHRD	National Health Research Database
NRP	National Rehabilitation Policy
OMs	Outcome Measures
PERSAL	Personal Salary System
PHC	Primary Health Care

RBM	Results-Based-Management
RMTs	Rehabilitation Multidisciplinary Teams
ROMs	Rehabilitation Outcome Measures
SCIM	Spinal Cord Independence Measure
SOAP	Subjective, Objective, Assessment, Plan notes
SOP	Standard Operating Procedures
SPSS	Statistical Package for the Social Sciences
TOC	Theory Of Change
UN	United Nations
VAS	Visual Analog Scale
WHO	World Health Organisation

CHAPTER 1: INTRODUCTION

1.1. Introduction

There is a lack of rehabilitation outcome data collection and use in South Africa (Department of Health, 2015) says the Framework and strategy for disability and rehabilitation services in South Africa 2015-2020 (FSDRS). The root course of this challenge emanates from the vested interests between public and private healthcare arrangements. Furthermore, the divide between rural and urban settings, and unequal resource management between rural and urban settings further exacerbate this problem (National Health Insurance Bill, 2019). Articles 31 and 33 of the United Nations Convention on the Rights of Persons with Disability (UN CRPD) calls for states to institute monitoring data streams that cater to relevant rehabilitation indicators and promote mechanisms that strengthen policy implementation for the rights of people with disabilities (Bickenbach, 2011). In addition, the International Classification of Functioning, Disability and Health (ICF) has for many years provided the platform for a common language to understand disability and rehabilitation, as well as providing avenues for reliable, validated health rehabilitation data collecting instruments (WHO, 2001).

With that said, this research discourse commences by defining key terms of great interest in this research study. These terms are: neurological-physical rehabilitation; rehabilitation outcomes; and rehabilitation outcome measures (which are referred to as data collecting instruments or tools). In this research, ***neuro-physical rehabilitation*** is represented by the term ***rehabilitation***, which is the term usually used in healthcare settings, referring to neurological, spinal, and physical treatment interventions. Rehabilitation is the process of tailored interventions aimed at optimising function, by reducing impairments, and providing tools to aid with independent integration into the communal environment (WHO, 2020). Neuro-physical rehabilitation entails treating conditions such as stroke, Traumatic Brain Injuries (TBI), Spinal Cord Injuries (SPI), Parkinson’s diseases, Multiple Sclerosis (MS), spasticity, polyneuropathies, and ataxia (Advanced Physical Therapy, 2022). Rehabilitation outcomes refer to the immediate or long-term result(s) of rehabilitation interventions. Important to note in this study discussion are Rehabilitation Outcome Measures (ROMs) which are tools used to collect data and measure the extent of change during and post-rehabilitation (Matthew and Teasell, 2013).

Evaluating rehabilitation outcomes leads to evidence-based decision-making, which advances the potential to contribute to the strengthening of National Health Insurance (NHI) implementation strategies, but this has not been fully implemented or explored in South Africa (Mji et al., 2013; Krug & Cieza, 2017). Some of the challenges expressed by the Framework and Strategy for Disability and Rehabilitation Services (FSDRS) in South Africa 2015-2020 report (Department of Health, 2015) include the scarcity of appropriate rehabilitation indicators; the lack of or poor national and provincial rehabilitation evidence evaluating the effectiveness of rehabilitation outcomes services to motivate for resources; and the lack of research associated with rehabilitation outcome services at all levels of public healthcare.

The reasons identified by the FSDRS (DOH, 2015) can be attributed to the unknown rehabilitation data monitoring and evaluation capacity. The dilemma of not promoting formal ROM instruments (tools) in the National Rehabilitation Policy (NRP) by the legitimising authority leaves room for poor compliance and mostly accountability, questioning the organisational reporting culture (Kusek & Rist, 2004).

This study evaluates the use of rehabilitation services outcome measures as a crucial instrument to strengthen rehabilitation deliverables. Examples of ROMs that this study seeks to evaluate are in the ICF Activity Limitation (AL) domain of disability, and they include (but are not exhaustive): Functional Independent Measure (FIM); Barthel Index (BI); Modified Rankin Scale (MRS); Frenchy Activity Index (FAI); and the Nottingham Extended Activity of Daily Living Scale (NEADSL) (Salter et al., 2013; Joseph & Rhoda, 2011).

The United Nations Convention on the Rights of Persons with Disabilities (UN CRPD) (2016); Department of Social Development (2016) on the White Paper on the Rights of People with Disabilities, 2015; NHI (2019); the National Development Plan (NDP) (Department of Social Development, 2015); and National Rehabilitation Policy (NRP) (Department of Health, 2000) have highlighted challenges to national data collection, and use in categories of impairment level, activity limitation, participation restriction, health, and environmental factors. All these policy frameworks in the international and local space share the same views articulating the importance of evidence-based monitoring and evaluation, research data collection, and statistics. Furthermore, these policy documents advocate for the principal objective of facilitating standardised, and improved data quality on rehabilitation outcomes.

1.2. Rehabilitation outcome measures, monitoring & evaluation prospects (Background)

Rehabilitation outcome measures are tools such as Functional Independent Measures (FIMs), Barthel Index (BI), Modified Rankin Scale (MRS), etc., that allow for the grouping of therapeutic scores, explanation of therapeutic results, and risk measure identification (Hefford et al., 2011). The intended function of Rehabilitation Outcome Measures (ROMs) is assessing change that has occurred over a period, from the initial assessment to the latest assessment, or posts the treatment intervention. For example, a patient that is assessed at admission with an FIM score of 56/126 is reassessed again after the rehabilitation intervention; this exercise evaluates the change in FIM score gains, and in this case at discharge, the patient's FIM score moved to 112/126 from 56/126, achieving an FIM score gains (improvement) of 56 points. Hefford et al. (2011) and Matthew and Teasell (2013) argue that successfully administering standardised rehabilitation outcome measures (such as FIM, BI, MRS, etc.) provide credible uniform information, ascertaining therapeutic effectiveness and strengthening accountability through evidence-based healthcare. In addition, with such credible information a decision on two fronts can be reached, firstly deciding to discharge the patient or extend the patient’s length of stay in the rehabilitation facility; secondly, this information could be used to demonstrate monitory value to the funder in compensation for rehabilitation services provided by the service provider.

However, no evidence points out whether the rehabilitation multidisciplinary teams are using outcome measuring tools to measure the effectiveness of rehabilitation in public healthcare settings. This is a result of no potential pressure exerted by the authorities to specifically monitor and evaluate rehabilitation service projects. This compromises patients’ rehabilitation outcomes in the public healthcare sector as this type of evidence is not well documented and packaged. Contrary to the private rehabilitation sector in South Africa, there is pressure exerted by medical aid schemes seeking evidence to account for whether patients improve or not, and from that evidence, the decisions to further fund or terminate funding of rehabilitation resources are made (Camp, Casteleijn & Thupae, 2020). There is an indication that multidisciplinary teams in private rehabilitation settings are using ROMs (FIM/FAM and APOM) to comply with the medical aid requirements and licensing (Camp et al., 2020). The two contrasting settings of public and private health are different, and public health is not trending well; the situation is worse in rural areas since there is a lack of rehabilitation-specific facilities as compared to urban areas (Camp et al., 2020; Bateman, 2012). Scarcity of healthcare human resource availability and long distances traveled by patients in between villages compound the challenge of rehabilitation outcomes positive prospects (Bateman, 2012).

This study is the first to compare awareness, usage, and capacity opportunities/constraints of ROM data instruments such as FIM, BI, MRS, FAI, NEADL across South Africa healthcare settings – public and private, in urban GP and rural KZN locations.

Devising and implementing measures that evaluate performance indicators within the public health sector serve as handy evaluation tools for overall accomplishment, is a necessary step in designing, evaluating, and improving rehabilitation programs' design (WHO, 2001; Wotela, 2017b). A variety of measuring tools that provide a full account of rehabilitation outcomes attained during rehabilitation interventions are available within the International Classification of Function, Disability, and Health (ICF) Framework (WHO, 2001), which suggests that these tools are available for use, leading one to question why sufficient data and statistics on rehabilitation outcomes within South Africa is sparse.

Globally there is a growing need for evidence-based decision-making. Byskov and Olsen (2005), Sidzumo and Wotela (2016), and the WHO (2007a) posit that accountability requirements for public service delivery demand an effective and efficient public health system. Kusek and Rist (2004) argue that data information is required to measure the performance of rehabilitation services interventions and to account for the delivery of public health services. Hence the rationale for the current study assessing the use of rehabilitation outcomes data measuring instruments.

The Medical Model of Disability, the Social Model of Disability, and the International Classification of Functioning, Disability, and Health (ICF) will be contested to find a theoretical home for disability and rehabilitation (WHO, 2001; Davis & Madden, 2006).

The research will further propose theoretical frameworks practised in public policy evaluation using the Public Value Theory of Management (Moore, 2013) to find its home in public development and management and will propose the tools of Theory of Change and Systems Thinking to devise possible interventions.

1.3. Problem Statement

The frequency of usage of data instruments by rehabilitation multidisciplinary teams to provide credible information on rehabilitation outcomes for persons with disabilities in both KZN rural public and GP urban public hospitals is largely unknown. The limited usage of rehabilitation outcome measuring instruments by rehabilitation multidisciplinary teams in public hospitals can be attributed to the lack of policy directions that should incentivise or adequately enforce the adoption of formal, state-monitored rehabilitation outcomes data collecting instruments in public rehabilitation facilities of South Africa (Hefford et al., 2011; Department of Social Development, 2015). These policy directions should therefore evaluate and influence health care policies (such as the NRP) which has the political determination that holds power over how resources are allocated to strengthen rehabilitation relevance and effectiveness to society.

In South Africa, much work has been done, mostly within the field of physiotherapy, to review outcome measures instruments, focusing both on awareness and the use by health care professionals (Joseph & Rhoda, 2011; Inglis et al., 2008). The extent of existing capacities to monitor and evaluate rehabilitation services by the multidisciplinary teams across public and private hospitals (including rural, public, and private rehabilitation settings) remains largely unknown.

The DOH (2000) NRP defines monitoring and evaluation but neglects to define the application and alignment thereof. Post-20 years of NRP development in the year 2000, the recent FSDRS in South Africa 2015-2020 reports insufficient and fragmented data collecting capacities amongst provinces leading to increased difficulty in evidence-based decision-making (DOH, 2015).Furthermore, the lack of evidence entering the era of NHI implementation limits planning that could motivate governmental investments in rehabilitation facilities to strengthen and support NHI provision and coverage in disadvantaged rural regions (DOH, 2015).

Countries like the United States of America, Canada, the United Kingdom, Japan, and Switzerland, in both public and private sectors, have long moved to rehabilitation outcomes measures data collection (Hamilton & Granger, 1994; van der Putten et al, 1999; Colantonio et al., 2010; Galloway et al., 2013; Ammann-Reiffer, Bastiaenen, & Van Hedel, 2019; and Shirahama et al., 2020). Moving towards the full implementation of NHI, rehabilitation measuring instruments and produced outcome data will be vital in assisting the NHI fund to compensate service providers, thus ensuring value for money.

1.4. Purpose of the Study / Research Aim

This research aimed to evaluate the use of rehabilitation outcome data measuring instruments across different settings in public and private rehabilitation healthcare facilities in KZN and GP. This provided a scope to assess the available capacity, opportunities for learning, and constraints that exist in these different healthcare settings, among the rehabilitation multidisciplinary teams.

1.5. Research questions

1.5.1 Are the rural KwaZulu Natal, urban Gauteng public Hospitals, and private rehabilitation hospitals in KwaZulu Natal and Gauteng aware of rehabilitation outcome measuring instruments to use when recording the progress or regress of therapy?

Hypothesis 1 - public hospitals in the provinces of KZN are not aware of ROM instruments to use when recording progress or regress of therapy.
Null-hypothesis 1 – public hospitals in the provinces of KZN are aware of ROM instruments to use when recording progress or regress of therapy.

Hypothesis 2 – public hospitals and private rehabilitation hospitals in GP are aware of ROM instruments to use when recording progress or regress of therapy.
Null-hypothesis 2 - public hospitals and private rehabilitation hospitals in GP are not aware of ROM instruments to use when recording progress or regress of therapy.

Hypothesis 3 – hospitals in the public rural settings of KZN are not aware of ROM instruments to use when recording progress or regress of therapy.
Null-hypothesis 3 – hospitals in the public rural settings of KZN are aware of ROM instruments to use when recording progress or regress of therapy.

Hypothesis 4 - hospitals in the public urban settings of GP are not aware of ROM instruments to use when recording progress or regress of therapy.
Null-hypothesis 4 – hospitals in the public urban settings of GP are aware of ROM instruments to use when recording progress or regress of therapy.

Hypothesis 5 – rehabilitation hospitals in the private urban settings of GP are aware of ROM instruments to use when recording progress or regress of therapy.
Null-hypothesis 5 - rehabilitation hospitals in the private urban settings of GP are not aware of ROM instruments to use when recording progress or regress of therapy.

1.5.2 Do the rural KwaZulu Natal, urban Gauteng public hospitals, and private rehabilitation hospitals in KwaZulu Natal and Gauteng use rehabilitation outcome measuring instruments to collect data?

Hypothesis 1 - public hospitals in the provinces of KZN are not using ROM instruments to collect data.
Null-hypothesis 1 – public hospitals in the provinces of KZN are using ROM instruments to collect data.

Hypothesis 2 – public hospitals and private rehabilitation hospitals in GP are using ROM instruments to collect data.

Null-hypothesis 2 - public hospitals and private rehabilitation hospitals in GP are not using ROM instruments to collect data.

Hypothesis 3 – hospitals in the public rural settings of KZN are not using ROM instruments to collect data.

Null-hypothesis 3 – hospitals in the public rural settings of KZN are using ROM instruments to collect data.

Hypothesis 4 - hospitals in the public urban settings of GP are not using ROM instruments to collect data.

Null-hypothesis 4 – hospitals in the public urban settings of GP are using ROM instruments to collect data.

Hypothesis 5 – rehabilitation hospitals in the private urban settings of GP are using ROM instruments to collect data.

Null-hypothesis 5 - rehabilitation hospitals in the private urban settings of GP are not using ROM instruments to collect data.

1.5.3 Do the rural KwaZulu Natal and urban Gauteng public hospitals have the capacity to monitor and evaluate the collection of rehabilitation outcomes data as compared to private rehabilitation hospitals in KwaZulu Natal and Gauteng?

Hypothesis 1- hospitals in the public rural settings of KZN do not provide ROM data collecting instruments.

Null-hypothesis 1- hospitals in the public rural settings of KZN do provide ROM data collecting instruments.

Hypothesis 2 - hospitals in the public urban settings of GP do not provide ROM data collecting instruments.

Null-hypothesis 2- hospitals in the public urban settings of GP do provide ROM data collecting instruments.

Hypothesis 3 – rehabilitation hospitals of private urban settings in GP do provide ROM data collecting instruments.
Null-hypothesis 3 - rehabilitation hospitals of private urban settings in GP do not provide ROM data collecting instruments.

Hypothesis 4 – there is no financial support provision for ROM data collecting tools training/workshops in the public rural settings of KZN.
Null-hypothesis 4 – there is financial support provision for ROM data collecting tools training/workshops in the public rural settings of KZN.

Hypothesis 5 – there is no financial support provision for ROM data collecting tools training/workshops in the public rural settings of GP.
Null-hypothesis 5 – there is financial support provision for ROM data collecting tools training/workshops in the public rural settings of GP.

Hypothesis 6 – there is financial support provision for ROM data collecting tools training/workshops in the private urban settings of GP.
Null-hypothesis 6 – there is no financial support provision for ROM data collecting tools training/workshops in the private urban settings of GP.

1.6. Objectives of the study

1.6.1 To ascertain the provision of rehabilitation outcome measuring instruments by the institution.

1.6.2 To assess data governance, quality, and appropriateness.

1.6.3 To assess the monitoring and evaluation data collecting capacity.

1.6.4 To evaluate rehabilitation data use, sharing, packaging, dissemination, and promotion.

1.6.5 To determine knowledge, use, and sources of education about rehabilitation outcomes measuring instruments.

1.7. Limitation and Delimitations

Only associations concerning the studied population of rehabilitation therapists around KZN, and GP hospitals were made because of the research design, sampling technique, and sample size limitations. The researcher chose to conduct a face-to-face delivery and collection of questionnaires, which was time-consuming, traveling to different locations of selected hospitals located within the KZN and GP. Not everyone in the healthcare facility participated in the study; but only those health workers identified as the rehabilitation multidisciplinary teams participated.

1.8. The layout of the Study

Chapter 1

This chapter sets a rehabilitation outcome measures discourse framework in the introduction. The background of the study, the problem statement, the purpose of the study, research questions with accompanying hypotheses, as well as research objectives are introduced.

Chapter 2

A literature review that discusses the South African healthcare system is presented; the physical location of the research setting context; challenges that affect rehabilitation data collection and usage; in addition, the research problem and research gap are further explained in detail in this chapter. Theoretical frameworks that encompass disability and rehabilitation are detailed here; the conceptual framework is developed; and the explanatory framework is also articulated here. Studies that shape the literature surrounding the research topic are highlighted in this chapter. Monitoring and evaluation of rehabilitation data strategies are also expounded here.

Chapter 3

Chapter 3 presents the quantitative research strategy that was selected, following a cross-sectional design type of data collection method, using a survey tool. The purposive sampling method was used to determine the 13 targeted hospitals, based in two provinces, KZN and GP in both public and private sectors. Stratified sampling was used per individual hospital to reach a sample size of plus 352 participants.

Data collection tools included: 1) demographic questionnaire; 2) resources for rehabilitation outcomes data collecting instruments; 3) data collection and information use; 4) skills capacity required to monitor and evaluate the collection of rehabilitation outcomes data; 5) accessibility, availability, and promotion of data used in the organisation; 6) clinical awareness/knowledge, use, and source of knowledge of the following rehabilitation outcomes data measuring instruments: FIM, BI, MRS, FAI, NEADL. Collected data was analysed using SPSS computer software for descriptive statistics analyses, and non-parametric Chi-square of independence was used.

Chapter 4

Demographics of the rehabilitation multidisciplinary teams are presented using descriptive statistics; in addition, research objectives and empirical results are presented using frequencies. In attending to Research Questions 1 to 3, both frequencies and non-parametric statistics of Chi-Square were used to establish associations between study variables of interest responding to the research questions.

Chapter 5

This chapter discusses research findings and expounds on their relevant significance and implications by supporting this study's results with evidence emanating from previous studies. The contribution of this study to the healthcare rehabilitation sector is further explained.

Chapter 6

Lastly, Chapter 6 presents the concluding remarks of the study, the main study findings, and the implications of the study, highlighting the possible research limitations and importantly recommending future actions to improve the rehabilitation outcome data collecting development intervention.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

The reviewed literature in this chapter entails endorsing the ten sections. Firstly, the importance of understanding the South African health system setting and its financing is briefly discussed in Section 2.2. Secondly, Section 2.3. points out the research problem and gap. Thirdly, Section 2.4 forms part of the theoretical framework applied in this study. Section 2.5 dwells on previous rehabilitation outcome measures research, and current research studies.

Evaluation of rehabilitation outcomes measuring tools is discussed in advance in Section 2.6. Linking public policy evaluation and rehabilitation health, in Section 2.7, the Public Value Theory of management lens is used to introduce monitoring and evaluation positions in good governance policy practices. Section 2.8 concludes this research's conceptual framework by linking the research objectives to the literature reviewed. The explanatory framework that summarises Chapters one and two further proposes the way forward beyond this research is covered in Section 2.9. Finally, Section 2.10 concludes the chapter.

2.2. Understanding the South African Healthcare System Setting and its Financing

Disability and rehabilitation are primarily located and happening under the due restriction of the department of health in South Africa. It is important to appreciate the history that shapes the South African healthcare system in terms of its scope and resource allocation financing mechanisms. Articulating the previous structure, and the current structure is what this section seeks to address. In this research, it is logical that the focus on rurality and the urban nature is observed as this effect or determines resources allocation relating to finances and human capital. Rehabilitation multidisciplinary teams need to be present in both settings (rural and urban) and budgetary resources to facilitate outcome measures instruments licensing (if required), the building of rehabilitation facilities, and human capacity building are crucial to be appropriately allocated. Section 2.2. draws attention to the timelines from the colonial and apartheid eras and the present democratic dispensation. This section will conclude with a diagram (Figure 2.1) depicting the current governing structure and revenue allocation per government sphere level.

Before the advent of South African democracy (1994) the structural functionality of the healthcare system was divided among the four provinces: Cape of Good Hope; Orange Free State; Transvaal; and Natal, which administered their healthcare systems independently, with the provincial administration responsible for curative care at the hospital level with 77% health expenditure (McIntyre & Dorrington,1990). Coovadia and others (2009) posit that the independent functioning of the healthcare administration through the central government, the provincial departments, and local authorities, led to South Africa ending up with 14 separate health departments. More emphasis was on the hospital level of care and therefore primary healthcare was neglected.

The extreme emphases on curative care were evident from the disproportional health expenditure which displayed the provincial health expenditure as being more powerful compared to preventive and promotive health expenditure in local government. The Gluckman Commission of 1942-44 made progressive findings, which included the proposal of community primary healthcare services for every citizen (Coovadia, et al., 2009). Gluckman was the health minister during that period, but before the implementation of his recommendations, in 1948 the apartheid regime took over and his recommendations were abandoned.

Figure 2.1 below demonstrates the current flow of the South African Department of Health governance structures from national, provincial, to local governments. The revenue sources per level of governance and the conditions guiding the financial spending are indicated. The Minister of Health is the national head discharging the overarching policy mandate, a two-tier type of healthcare dispensation in the form of private and public healthcare. Public healthcare is overseen by the National Department of Health, while the private health sector is managed by the independent Council for the medical scheme, which through medical aid schemes, funds private healthcare providers. Lastly, in public healthcare, the type of care responsibility that is permissible per level of the governmental sphere is indicated.

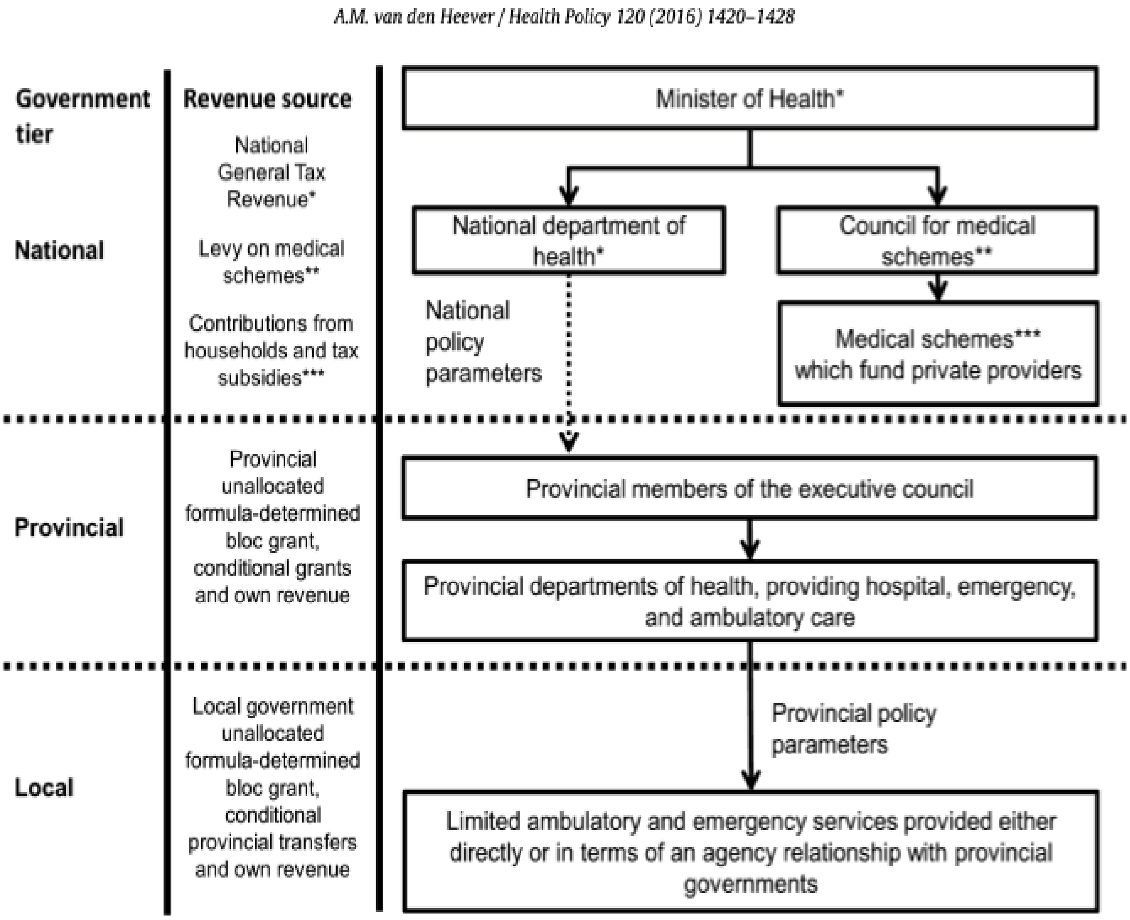


Figure 2.1: An overview flow of the South African Healthcare System (van den Heever, 2016)

South Africa is part of the global community and therefore the international trends subscribing to Universal Health Coverage (UHC) are necessary to align with, to achieve recent health systems and financing policy reforms happening around the world (Gilson, 2019). The bases of this research are aligned with the recent proposed South African health financing reform, termed the National Health Insurance (NHI) which has been promulgated into an Act by Parliament in 2019 (NHI Bill, 2019).

The South African financing system function has two-tiers, namely, the public sector and the private sector, both governed by the national MoH as the national health policy mandates (Gilson, 2019; van den Heever, 2016; Coovadia, et al., 2009; McIntyre & Dorrington,1990).

The proposed NHI policy highlights the unfair advantage that the 16,3%, (8,8 million) beneficiaries of affording or working class enjoys from the 3,4% total budget expenditure of 7,5% of GDP towards the private health sector. While 83,7% (45,2 million) people of the less advantaged population benefit from the remaining 4,1% provided to the public health sector of the total budget expenditure allocated to healthcare financing (NHI, 2019; van den Heever, 2016; Myezwa & Van Niekerk, 2013).

The workforce inequalities that exist between the two health sectors leave room for critiquing the private sector, which represents a distribution of about 80% medical specialists, and had an increase of medical doctors from 40% in the 1980s to 79% in 2007, servicing only 16 % of the private sector medical aid beneficiaries (Maphumulo & Bhengu, 2019; Coovadia et al., 2009). The NHI proposes fund- pooling strategies that use a single fund aimed at addressing challenges of escalating costs, human resource inadequacies, and improved access to healthcare services (NHI Bill, 2019).

2.2.1. South African Healthcare Structural Setting Post-1994 to The Current Democratic Dispensation

In the pursuit of understanding the South African government structures and the health administrative processes, the background of how the South African constitution arrangements are discharged is important. This sub-section provides the perspective on how administrative governance flows from the legislature, the executive, and the judiciary. This relates to the mandatory responsibility of the executive, which is the National Minister of Health in this case, responsible for national health policy discharge.

The NRP falls under the mandate of the Minister of Health, therefore this research aims to suggest that the NRP amendments are necessary to address the issues of rehabilitation outcome instruments' mandatory usage, to improve data collection and accountability. Furthermore, the three spheres of government are discussed and the formulation of nine provinces is important in this research because they locate the two research sites which are KZN and GP. This section concludes by displaying the South African map with nine provinces highlighting the two above-mentioned research settings.

The overall responsibility of health policy, which includes identifying national goals and priorities is accounted for by the Minister of Health (MoH) who discharges the mandates that set the national health legislation and oversight of all the systems (van den Heever, 2016; Sidzumo and Wotela, 2016; Brauns, 2013). The national health goals derived from the National Health strategic plan includes the competing priorities of quadruple diseases which are important to mention. South Africa is plagued with communicable diseases (HIV, Tuberculosis); maternal, infant, and child mortality; as well as non-communicable diseases such as: diabetes; cardiovascular diseases; cancers; violence injuries; and trauma (Coovadia et al., 2009).

Disability is located within the non-communicable diseases as having a secondary nature condition that may result from: congenital deficits; cardiovascular diseases such as stroke or heart attack; terminal illness due to cancerous diseases leading to terminal disability; violence or traumatic injuries that may manifest as spinal cord injuries or traumatic brain injuries or mental illnesses (Myezwa and van Niekerk, 2013, DOH, 2015). Rehabilitation is the response and restorative process that addresses disability (Salter et al, 2013, Brauns, 2014). It is worth mentioning that disability may result from long term illness of communicable diseases that are not properly managed (such as TB or HIV/AIDS).

Sidzumo and Wotela (2016) and van den Heever (2016) agreed that South Africa is composed of three spheres of government, namely, the national government, the provincial government, and the local government. Van den Heever (2016) continues to say that policy integration flows through the National Health Council (NHC) represented by the Provincial Executive Council (PEC).

At the provincial level, the DoH is led by the Member of the Executive Council (MEC) which is the political head, and the administrative duties are executed by the Head of the Department (HoD) (Sidzumo, 2016). Similar arrangements are followed by all nine provinces, and local governments (van den Heever, 2016). Provinces further perform responsibilities such as issuing licences for public and private hospitals, specialised hospitals, monitoring and supporting the functioning of districts' health services (Brauns, 2013).

Figure 2.2 below, displays the South African map with all nine (9) provinces in distinct colours demarcating their boundaries in relation to one another. South Africa's provinces are constituted by: Eastern Cape; Free State; Gauteng KwaZulu Natal Limpopo; Mpumalanga; Northern Cape Northwest; and Western Cape. This study was conducted across two provinces of KwaZulu-Natal and Gauteng healthcare contextual settings, as indicated by the red circles on the South African map.

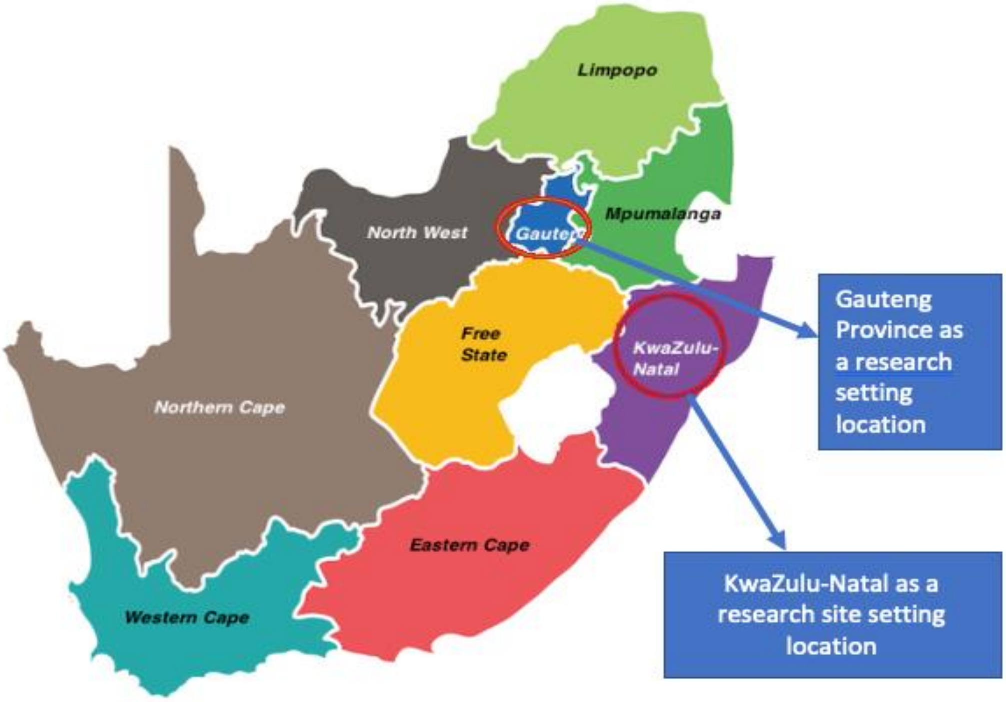


Figure 2.2: Depicting the South Africa's map with its nine provinces, highlighting Gauteng and KwaZulu-Natal research settings, as articulated by the research topic.

In conclusion, Section 2.2 captured the role of finding a home of this research as being the Department of Health (DOH), where rehabilitation of patients takes place at all levels of the healthcare facilities. Rehabilitation multidisciplinary teams are healthcare employees discharging the healthcare mandate, which is to improve the quality of life. The responses of Private and Public healthcare facilities to the research questions were of great interest, because these are where rehabilitation outcome measures were used to collect data. The governance structures flow contextualised how health policy is discharged. Understanding the nature of a two-tier budgetary allocation showed distinct differences in resources allocation between public and private healthcare, which is important, as it has impact on how rehabilitation data is collected and used. Lastly, the South African map depicts two provinces of KZN and GP where the research data collection was conducted as directed by the research topic.

2.3. Rehabilitation Coverage and Rehabilitation Outcome Data Usage Challenges

In this section, a discussion expands more on the research problem statement mentioned in 1.3., and further draws on the literature surrounding rehabilitation coverage challenges and the use of outcome measures. It continues to focus on the NRP shortcomings, briefly discusses the DOH (2015) FSDRS findings which mostly outlined the fragmented rehabilitation data collection and mentions the NHI Bill ideals. Specific monitoring and evaluation focusing on rehabilitation programs appear missing. The section concludes by pointing out that research related to rehabilitation outcomes is absent.

The NHI proposes universal healthcare coverage, meaning free access to healthcare provision at the point of delivery for all citizens. Writers like Mji et al. (2013), Myezwa & Van Niekerk (2013), and Morris et al. (2019) present strong views pointing out that rehabilitation policies and legislative frameworks have not been sufficiently evaluated and lack assessment of workforce inadequacies, accompanied by skill capacity shortages, consequently further stagnating the implementation of NHI propositions.

Contrary to the NRP which places more emphasis on strengthening (Myezwa & Van Niekerk, 2013), Primary Health Care (PHC) delivers quality rehabilitation services employing the Model of Community Based Rehabilitation (CBR) (Mji et al., 2013). However, this fails as a result of challenges related to unequal distribution of healthcare resources between urban and rural areas. South Africa is currently in the process of implementing the NHI, however, uneven infrastructural availability and development highlight the divide between urban and rural areas (Mji et al., 2013; Myezwa & Van Niekerk, 2013). There are only two public specialised neurological-physical rehabilitation facilities in South Africa, one in Cape Town and one in Pretoria (DOH, 2015).

There is a loud outcry expressing the lack of rehabilitation data indicators that measure the benefits of this service (Myezwa & Van Niekerk, 2013; Mji et al., 2013). Largely, the data is fragmented amongst provinces with no central national data information point that tracks the progress of rehabilitation outcomes, especially within public hospitals (DOH, 2015). The available data mainly measure access to rehabilitation services, and the number of assistive devices issued to the clients.

For example, the KZN 2019/20 Provincial Department of Health Annual Report states that in the period of 2015 and 2019, 3.6 million rehabilitation clients accessed this service, and furthermore, claims that 20 450 wheelchairs were issued, 15 260 hearing aids were provided to clients, and more than 240 100 different devices were issued (KZN Dept of Health Provincial Annual Report, 2020, p.59). The GP Provincial Department of Health Annual Report also collected data on the same indicators, putting forward that in 2019/20, the overall number of assistive devices issued was 78 720, of which 4 639 were wheelchairs, 38 226 were walking aids, and 6 436 were hearing aids (GP Dept of Health Provincial Annual Report, 2020, p.22).

This type of data does not categorically measure the extent to which life has changed after accessing rehabilitation services and receiving assistive devices, thus the effectiveness of rehabilitation services is unmeasurable at this point. The NRP has not emphasised rehabilitation outcomes data collecting measuring instruments, which has led to the shortcomings of incentivisation and standardisation of tools to measure rehabilitation effectiveness. Although national policies are broad and overarching, further provincial programs should provide sufficient administrative systems that set out Standard Operating Procedures (SOPs) and Clinical Guidelines that focus specifically on rehabilitation outcomes data indicators, measuring the quality of these services. However, this accountability measure is lacking.

The empirical evidence detailing the existing monitoring and evaluation capacity to monitor and evaluate rehabilitation services amongst rehabilitation multidisciplinary teams in both public (urban and rural) and private hospitals remains largely unknown. Monitoring and Evaluation (M&E) has not been explored as a management tool that offers responsive and relevant evidence to enhance decision-making in rehabilitation healthcare within the South African context (Myezwa & Van Niekerk, 2013; Mji et al., 2013).

The DOH (2000) NPR mentions the importance of monitoring and evaluation and developing mechanisms to collect specific data in specific rehabilitation programs to enrich decision-making. Besides the mentioning of monitoring and evaluation in the NRP, it neglects the follow-up strategies in application and alignment with the rehabilitation programs. Furthermore, the absence of a NRP evaluation leaves a gap whereby it is difficult to measure how much written in the paper has been practically achieved. The paucity of monitoring and evaluating rehabilitation data collection is greatly expressed by the recent Framework and Strategy for Disability and Rehabilitation Services in South Africa 2015-2020 reporting insufficient and fragmented data collecting capacities amongst provinces, leading to increasing difficulty in evidence-based decision-making (DOH, 2015).

Key indicators assessing the impact of rehabilitation service on morbidity and quality of life lack alignment or are not specific enough to collect critical information on therapeutic interventions. The curative and mortality data are well developed within the medical health system (Myezwa & Van Niekerk, 2013; Bateman, 2012). GP Health Province 2019/20 Annual Report (2020, p.34, 37) indicated that in about 97% of HIV-positive ANC mothers enrolled on Antiretroviral Therapy (ART), their Polymerase Chain Reaction (PCR) positivity rate improved, depicting a decline from 1,19% in 2018/19 comparing it to 0,71% of 2019/20 year. Another example with regard to non-communicable diseases indicated that 2 406 569 hypertension patients visited health facilities and 2 007 256 (83,4%) recorded blood pressure below 140/90 mmHg; diabetics' visits were 608 221, and out of those, 463 662 (76,2%) presented with normal blood glucose levels under 11,1 mmol. In both the first (communicable diseases) and second (non-communicable diseases) examples a PCR test was used, a blood pressure cuff measuring in mmHg, and a blood sugar meter was used measuring in mmol/L, respectively.

The above-mentioned measuring instruments (tools) are clear, specific, and measurable, but then in rehabilitation services, there are measuring instruments that can achieve the same effective results, which have not been explored in South Africa's context. Following the recommendations of Myezwa and Van Niekerk (2013), this study aimed to influence monitoring and evaluation of morbidity and quality of life data collection and use, referring to the rehabilitation-orientated system.

Most of the available rehabilitation-related research in South Africa is concentrated on clinical practice management of patient conditions, consequently leaving a void in research focusing on the development of rehabilitation outcomes data management instruments. The rehabilitation service strategic framework of 2015-2020 indicates that there is limited research focused on the outcomes of rehabilitation services in all levels of care (secondary, specialised, tertiary, and Primary Health Care) (DOH, 2015; and DOH, 2000).

The point of departure here is recognising that the lack of use of data measuring instruments to evaluate rehabilitation outcomes and research in this field limits the appropriate allocation of resources and effective service delivery (DOH, 2015; Myezwa & Van Niekerk, 2013). Thus, evaluating rehabilitation outcome measures data use in decisions has the potential to strengthen NHI implementation strategies, but this is a missing link that need special attention.

Section 2.3 identified the research problem in broader terms, which relate to the largely unknown use of rehabilitation outcome measures in public healthcare facilities. This was attributed to inadequate evaluation of the NRP that does not mandate the use of standardised rehabilitation outcome measures tools. Thus, there is poor and fragmented rehabilitation data availability, and as a result it is difficult to evaluate the effectiveness of the rehabilitation service. More so, the literature exposed the unknown workforce capacity skills to monitor and evaluate rehabilitation data collection. Literature reviewed in this section motivated the formulation of research questions focusing on data collecting and skills funding resources allocation. Furthermore, the research gap identified indicated that in the South African context, individual professions write about using rehabilitation OMs in isolation, but very few to no research publications have written about the use of rehabilitation OMs by multidisciplinary teams. Therefore, the literature reviewed in this section encouraged the investigation as to whether the rehabilitation multidisciplinary teams were aware of or used rehabilitation outcome measures in their clinical practice.

2.4. Theoretical Frameworks Shaping Disability as A Field of Study

Section 2.4. introduces disability as a field of study, starting by defining disability; it further expands on internal and external environmental conditions that extend beyond the health status of a disabled individual. ICF is encompassed as the focal framework that brings together the Medical Model of Disability and the Social Model of Disability. This section takes stock of what is happening in the disability space (Sub-section 2.4.1).

The effort to monitor and evaluate the inclusivity of disabled people led to this section articulating the critical value of disability as a field of study by the academic fraternity, in the higher education space, by disability civil organisations, and communities themselves.

Covered in Subsection 2.4.1.1. are facts surrounding employability, and the rights of people with disabilities are briefly highlighted. The plight of marginalisation and the environmental and publicly carried myths that perpetuate barriers are mentioned in this section, so that we comprehensively grasp the disability construct.

Figure 2.3 in this section, through Subsection 2.4.2. deeply reflect on disability by contrasting three disability models (Medical Model, Social Model, and ICF). Sub-section 2.4.2.1 zooms in on the ICF framework by selecting the Activity Limitation as a domain that responds to rehabilitation as a process that assisted in the identification of five (5) rehabilitation outcome data measuring instruments that forms part of the data collecting instrument in this research. Subsection 2.4.2.2 concludes Section 2.4, by introducing rehabilitation as a process that responds to disability. Most rehabilitation takes place in hospitals (in health facilities), where most of the multidisciplinary teams interacted with in this research are located.

Subsection 2.4.2, firstly contrasts the Medical Model with the Social Model of Disabilities; secondly, this is further subjected to Subsection 2.4.2.1, which explains the focal framework of this research namely, The International Classification of Functioning, Disability, and Health (ICF) Framework (Model) For Disability; thirdly, and lastly, Subsection 2.4.2.2, connects Rehabilitation within the ICF Framework as interactions of disability; and all the above-mentioned subsections are iterated by Figure 2.3.

Disability is a health condition acting as a restriction that limits the performance of body parts, or mental abilities, preventing the individual from completing certain tasks, activities, or functions (Wells-Jensen & Zuber, 2020; Pope & Brandt, 1997). However, Watermeyer et al. (2006) and Mji et al., (2013) argue that it is an intersection between the health condition, and the internal and external environmental contextual factors surrounding the individual with disability.

Additionally, the ICF articulates disability as a fluid concept occurring at levels of impairment, of body parts relating to an arm, spinal cord, loss of hearing, loss of sight, and mental illness, affecting activities of daily living, therefore limiting participation in societal events (WHO, 2001).

The ICF further upholds the view that environmental factors perpetuate or alleviate disability by presenting barriers or facilitators. Furthermore, it recognises the voices of persons with disabilities and people with disabilities' civil organisation through the *Social Model of disability* which cements the comprehensive understanding of disability. The *Medical Model* associates the concept of disability with seeking to manage impairment and facilitation of activities of daily living within health facilities.

2.4.1. Monitoring and Evaluation of Inclusion of People with Disabilities

Disability studies play a crucial role in understanding disability and developing strategies that create a conducive environment for inclusive deliberation on issues surrounding disability. Disability as a field of study is still emerging in South Africa and there are not enough voices contributing to disability's academic space. Nevertheless, South Africa is progressively working towards achieving disability inclusivity; the discourse is embodied by vibrant disability movements such as Disabled People South Africa (DPSA), creative campaign organisers, political affiliations, and disability activists (Watermeyer et al., 2006).

Disability academic research has become an important objective, thus leading to the development of trained personnel who understand how to respond to and effectively manage disability (Watermeyer et al., 2006). Disability Studies strengthen social justice, by influencing cultural practices, economic inclusion, political engagements, and carefully managing the ever-evolving environmental factors (Watermeyer et al., 2006).

The capacity and skills development of health personnel, caregivers, and community advocacy serve as the backbone towards achieving the purpose of disability studies. Therefore, a shared understanding of disability enhances outcomes of disability issues (ICF, WHO, 2001). Collecting data on various levels of disability and from diverse sources of disability indicators creates a powerful information tool aiding in evidence base reporting, decision-making, and a broader understanding of disability (ICF, WHO, 2001; Watermeyer et al., 2006; Kusek & Rist, 2004).

2.4.1.1. Disabled People's Employability and Disability Rights

Statistics South Africa state that the prevalence of disability in South Africa is 7.5 percent and there are less than 1 percent of people with disabilities employed (Stats SA, 2011; Daily Maverick, 15 November 2020). The barrier to employment of disabled people is due to stigma, myths, attitudinal behaviours, perceptions, and shame that is experienced at the workplace. Several initiatives attempt to address the unemployment of disabled people. For example, the Employment Equity Act No. 55 of 1998 addresses the issue of reasonable accommodation.

The concept of the Employment Equity Act attends to issues of a non-judgemental, non-discriminatory approach by providing equal opportunities that minimise barriers, and finding reasonable accommodation within available means by transferring or equipping the affected employees with relevant skills in the workplace (Employment Equity Act, 1998).

Enterprise Development Hubs are available in South Africa, which provide skills development initiatives focusing on disabled people, preparing them for employment, or creating their employment (Daily Maverick, 15 November 2020). However, this has not translated to impactful changes in the status quo of disabled people due to societal stigmatisation and working environment barriers.

It is a fact that most disabilities are exacerbated by the surrounding environmental factors (Watermeyer et al.,2006). These usually present themselves as different barriers ranging from physical access to public buildings, work environment, education facilities, and lack of appropriate technologies. Omazic, Roska and Grobelna (2018) agree that physical environments such as ramps, elevators, or adapted ablution facilities cause barriers to acquiring employment for disabled people. They further express that the lack of technology to compensate for reasonable accommodation, such as adapted computer keyboards for blind people, disadvantages disabled individuals.

More often, employers and facility owners complain about costs related to the accommodations required to employ disabled people, but Hernandez et al. (2008) disagree and argue that costs to provide reasonable accommodation are affordable and fairly minimal. The United Nations CRPD (2016) update attempts to provide a solution by pronouncing tax exemptions for expenditure incurred for the accommodation adjustments.

The broader recognition of the rights of people with disabilities emanates from the title of a book by Charlton (1998), “*Nothing about us without us*”. The 1997 White Paper on Integrated National Disability Strategy (INDS) was a response by the South African government researching issues that strongly put disability in the forefront. The book highlights the oppression, discrimination, and resistance to the empowerment of people with disabilities (Charlton, 1998).

A very crucial take-home message from Charlton’s (1998) book “is that in matters concerning disability, the voice of people with disabilities comes first and should never be ignored, and the inclusion status of this critical stakeholder is most important.

2.4.2. Contrasting the Medical Model with the Social Model of Disabilities

The *Medical Model of Disability* views disability as a problem of an individual, resulting from trauma, disease, or a health condition (Matsika, 2009; WHO, 2001), and bodies of disabled people are seen as incapacitated, requiring professional therapeutic assistance (Mji et al., 2013). Matsika (2009) and Mji et al. (2013) point out that in this model of disability, a person must be in a state of sickness , admitted, or visiting a health facility, and be under the care or surveillance of a health professional.

Mji et al. (2013) have continued to say that the function of the medical model of disability cannot be ignored, which is to eliminate disability and/or return the impaired individual to the community. Furthermore, the medical model of disability has contributed to sustaining survival rates, resulting in improved life expectancy (Matsika, 2009). Therefore, it should be agreed that most disabled persons require urgent medical and rehabilitation interventions (Matsika, 2009). Rehabilitation is the main process that is undertaken by health professionals to reduce impairment, providing therapy modalities that enable the disabled person to achieve relative maximum function and independence (Mji et al., 2013).

In contrast to the medical model, the *Social Model of Disability* provides a paradigm shift (Mji et al., 2013) towards locating disability as an external source (Dirth & Branscombe, 2017) that imposes social restrictions on persons with disabilities which are environmental and societal spheres (Matsika,2009). Dirth and Branscombe (2017), Mji et al. (2013) and Matsika (2009) assert that the social model conceptualises disability by departing away from the disabled individual’s health condition, but directing disability to the imposed barriers, discriminatory attitudes, and environmental constraints surrounding disabled people.

Some have criticised and questioned the social model endorsed by Matsika (2009) and Mji et al. (2013), by suggesting that it ignores the core mandate of the medical model, which provides rehabilitation, and addresses issues surrounding disabled people's experiences such as pain, bodily and mental impairments, and the potential to improve the quality of life (Hammell, 2006). Feminists have further argued that the social model disregards issues of sexuality and extensive knowledge acquired through special health education (Hughes & Patterson, 1997). Mji et al., (2013) point out that if disability occupies the space in politics and human rights trajectories, there is a potential to address fundamental issues of health, social development, labour, and education, thereby progressively moving towards social inclusion.

The medical model of disability has its positive attributes which intend to rehabilitate by providing therapeutic interventions, therefore, preventing complications, and improving quality of life. However, the power exercised by health professionals leads to unintended consequences that may prejudice and marginalise disabled people. Resistance by disability activists have provided a paradigm shift toward the more considerate and inclusive approach of the social model of disability.

The United Nations Standard Rules put forward the social model of disability as a tool that advances the rights of people with disabilities. South Africa followed suit in 1997 through the Disabled People Organisations (DPOs) supported by the development of the Integrated National Disability Strategy (INDS), by shining the light on disability and rehabilitation (Mji et al., 2013; Matsika, 2009; Office of the Deputy President, 1997). The INDS incorporated issues of disability and rehabilitation within the socio-political environment in the office of the deputy president.

The social model of disability shifts the analytical nature of disability away from impairments and toward the concept of civil rights, while the medical model views disability as an individual problem and a health condition. In recognition of these opposing views at distant extremes, to cater for complexity, a necessary shift towards the model that brings about consensus by offering the two models' characteristic intersection was born. As a result, the bio-psychosocial approach was developed, formally referred to as the *International Classification of Function, Disability and Health* (ICF) (WHO, 2001). The ICF provided a different dimension in the discourse surrounding rehabilitation conceptualization.

Figure 2.3 indicates disability itself as a whole and continues to depict three models, firstly, the *medical model of disability*, where the rehabilitation multidisciplinary teams are located and where data-collecting instruments are utilised. Secondly, is the *social model of disability,* which recognises the rights of persons with disability and acknowledges that they are important stakeholders in the process of rehabilitation. Thirdly, and lastly the *ICF framework* which forms the basis for tracing and locating the rehabilitation outcome measures data collecting instruments was selected as a model of choice.

The ICF is further expanded to identify its domains which define disability at impairment, activity, and participation components. Furthermore, the process of rehabilitation is introduced as an intervention to remove disability, reduce disability, or restore function. Therefore, *activity limitation* in this research is the rehabilitation domain of choice to continue with and use rehabilitation outcome data measuring instruments to measure rehabilitation functional gains.

Five activity limitation rehabilitation instruments are named as they appear in Figure 2.3, forming part of the variables in the research data collecting instrument. Functional Independent Measure (FIM), Barthel Index (BI), Frenchy Activity Index (FAI), Modified Rankin Scale, and Nottingham Extended Activity of Daily Living Scale.

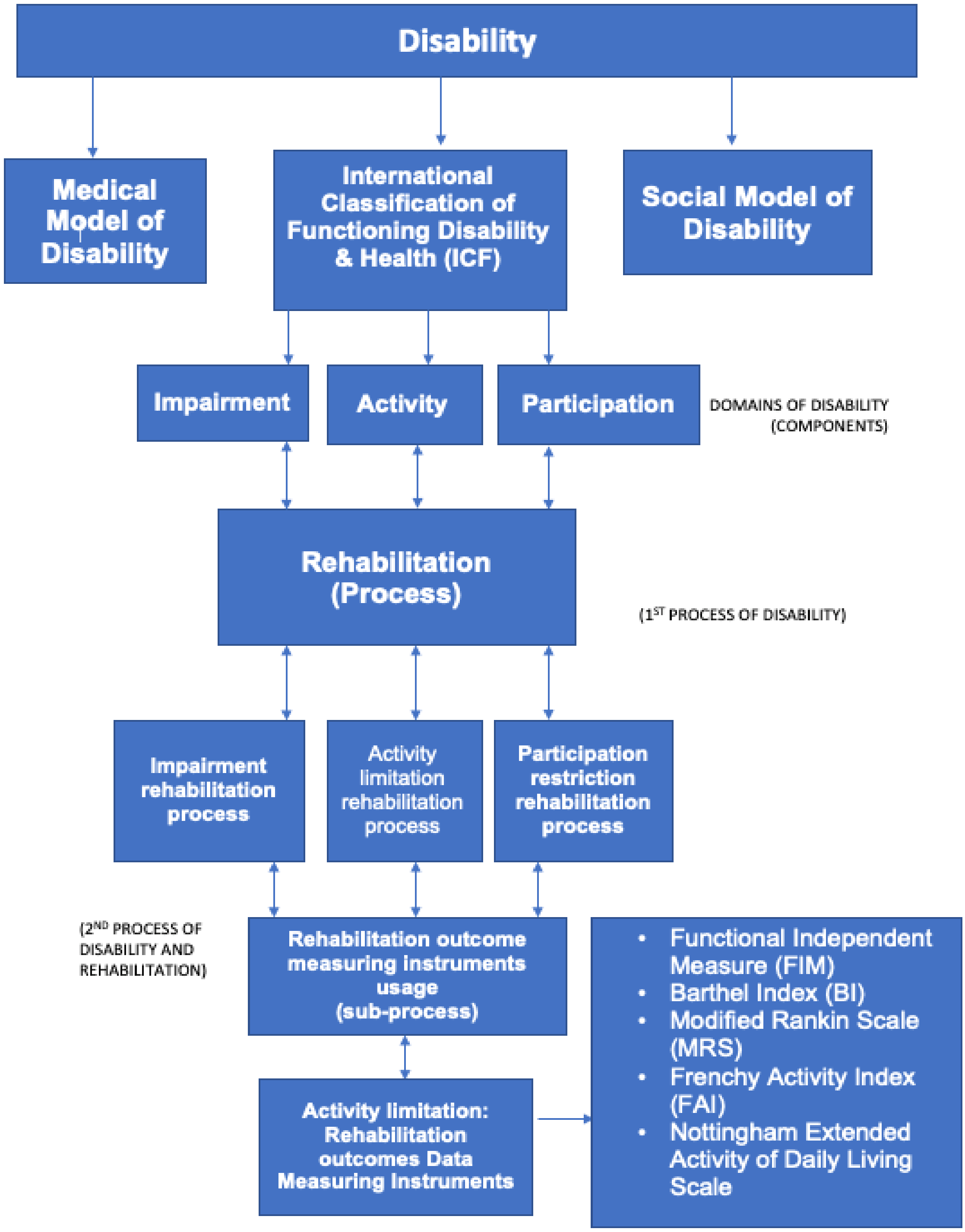


Figure 2.3:Study of Disability, Models of Disability, Domains of Disability Levels, Rehabilitation Process, Its Attributes and Variables critical in using Rehabilitation Outcome Measuring Instruments.

2.4.2.1. The International Classification of Functioning, Disability, And Health (ICF) Framework (Model) For Disability.

The development of the ICF framework provides a levelling ground that balances the elementary characteristics of the *medical model of disability* and the *social model of disability* by taking into consideration the biological, psychological, social, and cultural aspects that surround disability and rehabilitation. For this reason, it is referred to as the *bio-psychosocial model* of disability (WHO, 2001; Matsika, 2009; Salter et al., 2013).

It promotes the prevention of disability complications, and health through community-based rehabilitation, and facilitates the provision of social support by factoring in the UN Convention on the Rights of Persons with Disabilities (Watermeyer, 2006). Some disability scholars and activist movements have not fully approved ICF, saying that ICF treats disability as an expression of internal personal, and external environmental factors, but fails to appreciate the surrounding individual background contextual factors concerning gender, race, regional values and norms, educational past experiences, and the ICF tool adaptation (Watermeyer, 2006).

They continue to say ICF still contains the pervasive nature of oppression observed in *the medical model* where more power is leaning towards health professionals' control (Watermeyer, 2006). Nevertheless, the entirety of ICF is still the best framework that caters to various dimensions that are critical in the conceptualisation and comprehensive coverage of disability and rehabilitation an assertion that is supported by Salter et. al (2013), Mji et. al (2013), Matsika (2009), Watermeyer et al. (2006) and WHO (2001).

WHO (2001) and Salter et al. (2013) posit that disability intersections take place at three different domain levels, which are impairment, activity, and participation**.** These writers further articulate that the impairment level relates to body parts functioning, for example, knee movement, brain for decision-making, and the ear for hearing . The activity level denotes activity limitation, which is the actual disability, at the individual level such as the inability to walk, which is not being able to move from Point A to Point B with one's legs; as well as the inability to think logically, a failure to recall your family members' names, or loss of hearing. Participation indicates the participation restrictions mostly imposed by environmental factors in a household, families, communities, places of work, and societal involvement, for example, the experience of not being involved, not participating in decision-making because of a walking disability yet having a fully functioning brain, or not able to attend a community meeting because of the lack of a wheelchair.

It is critical to note that this research views the three domains as the fundamental components of disability. These components form a structural building block as to why the world is studying disability. Responding to disability brings about a process called rehabilitation. To assess and measure the effectiveness of the rehabilitation process, another subprocess of rehabilitation, that of outcome measurement, is necessary.

2.4.2.2. Rehabilitation Within the ICF Framework

Rehabilitation is the process comprised of tailored interventions focusing on maximising function, by minimising impairments through the provision of tools that aid independent integration into the immediate environment. The United Nations Convention on the Rights of Persons with Disabilities, Article 26 has revisited the definition of rehabilitation and improved it to an inclusive broader process that embraces health, employment, education, and social services (UNCRPD Article 26, 2019; Musoke & Geiser, 2013).

Scholars such as Musoke and Geiser (2013), Matsika (2009), and Watermeyer et al. (2006) agree that rehabilitation is a process aimed at enabling, restoring (to whatever extent), and maintaining optimal functioning of the physical, sensory, mental, social, and vocational capabilities that were lost through injury, illness, or disease. Rehabilitation responds to the three domains of disability; which means that rehabilitation can focus on the impairment, activity, or participatory component.

Different approaches that offer a wider range of interventions are available. These approaches include multidisciplinary, interdisciplinary, and transdisciplinary rehabilitation teams (Matsika, 2009). At times, rehabilitation approaches are person-centred, individual, usually in an institution, or community-based participatory process incorporating people with disabilities (Musoke & Geiser, 2013). Personalised assessments provide guidelines for appropriate rehabilitation type and which rehabilitation outcome measures to use (Salter et al., 2013).

Rehabilitation specialists express frustration by pointing out that they attend patients at a stage where the disease or illness has progressed so far, and where the curative care providers have failed and then only refer the patient to rehabilitation specialists, which indicates that curative care practitioners do not value rehabilitation medicine interventions at an early stage of disease or illness progression (Musoke & Geiser, 2013).

A study done by Bateman (2012), made some interesting findings about rehabilitation challenges, in which some inpatients referred to the hospital were not attended to, others were prematurely discharged without receiving therapy with no follow-up therapy plans, and in certain cases, because of poor living conditions and far distances to travel to rural hospitals, in situations where patients had no transport fees, they missed therapy sessions, and often developed complications which led to hospital readmissions. Bateman (2012) proposes a rehabilitation-oriented system that advocates for morbidity and quality of life data that will bring rehabilitation data evidence to the fore.

As has been said before, rehabilitation takes place in different forms and approaches, and for this reason, a Community-Based Rehabilitation (CBR) concept of rehabilitation has a far-reaching impact beyond the medical model through societal inclusion (Watermeyer et al., 2006; Musoke & Geiser, 2013; WHO, 2010). CBR uses a cross-cutting approach involving multiple stakeholders, and advocates for the rights of people with disabilities, equalisation of opportunities, and importantly, addressing rehabilitation as means to an end, and is indeed an enabling process (Musoke & Geiser, 2013). Regardless of the rehabilitation setting, the overarching function of the rehabilitation process is gaining strength, re-educating skills, or discovering alternative ways of solving problems and living a fulfilling life.

Different authors agree with the notion that rehabilitation post-disability mostly happens in hospital institutions, and multidisciplinary teams of rehabilitation professionals are involved or supposed to be involved during these early stages. Consequently, this research involved approaching personnel working in hospital facilities to respond to the research questions related to this study. In addition, it was assumed that rehabilitation multidisciplinary teams in hospital settings were using or were aware of Rehabilitation Outcome Measures data instruments utilisation to ascertain rehabilitation effectiveness, which is what the research was assessing.

To conclude Section 2.4, there is an appreciation of disability as a field of study and where rehabilitation restorative processes are put in motion, without disability there would be no need for rehabilitation and therefore no need to know about or use rehabilitation OMs. Challenges of people with disabilities are highlighted and their rights are briefly discussed . Three models of disability (medical model, social model and ICF) were focussed on with the goal of understanding disability. This section played a critical role by using ICF to trace five rehabilitation outcome measures data collecting tools (FIM, BI, MRS, FAI, NEADL) which were used in the research questionnaire to collect data on the rehabilitation multidisciplinary teams. Section 2.4 provided the first leg of the conceptual framework development for this research.

2.5. Previous and Current Studies on Rehabilitation Outcomes Measuring Instruments, Procedures, and Methods Used During Data Collection

This section (2.5) reviews previous and current studies that have investigated rehabilitation outcomes measures awareness and usage locally and globally. The interest was to determine which methods are frequently used to collect data, procedures that are followed, how findings are analysed, and conclusions reached by other studies that could enrich this research. In this section, decisions regarding strategy and the commitment to undertake quantitative research, are outlined. Furthermore, this section discusses the process followed in developing the data collecting instrument and types of attributes and variables to collect data on. The decision was made to conduct the study based on the rehabilitation multidisciplinary teams.

In their study, Inglis et al. (2008) used an electronic survey tool, by means of which they were initially aiming to collect their data, but due to a lower response rate, a survey was resent via email. These researchers (Inglis et al, 2008) utilised a self-developed questionnaire that contained 18 items, of which 15 were closed-ended questions and the remaining 5 were open-ended questions. The questionnaire was subdivided into two sections, Section A captured demographic details while Section B assessed awareness and usage of Outcome Measures (OMs), and further asked about barriers preventing the use thereof.

Their study portrayed apparent quantitative features and therefore qualified as a quantitative, cross-sectional plan of data collection. The researchers studied the most frequently mentioned outcome measures, which were, Peak Expiratory Flow Rate, Oxford Scale, six (6)-min Walk Test, and Range-Of- Motion (ROM). They further looked at the impairment measures including, Auscultations, Range-Of-Motion, and Oxford Scale. The least used type of outcome measure was Quality-of-Life (QoL) which comprise the Caregiver Strain Index (CSI), and Reintegration to Normal Living Index (RNLI).

Findings from these researchers revealed that in a physiotherapy practice, 82% of physiotherapists use outcome measures for effective clinical practice, and only 15% are used for evidence-based practice (Inglis et al., 2008). This finding ultimately means that there is no potential pressure that encourages the use of evidence-based data collection to make decisions about rehabilitation outcomes. Furthermore, in South Africa, no research has evaluated the use of rehabilitation outcome measures by the multidisciplinary rehabilitation team.

A similar study was done by Agyenkwa et al. (2020), who assessed the use of standardised outcome measures for stroke rehabilitation among physiotherapists in Ghana. They utilised a cross-sectional survey on physiotherapists treating stroke patients. Their questionnaire had 35-items divided into two parts. Part one tracked the demographic characteristics of the respondents, which included age, sex, work experience, level of education, and type of facility (public or private). Part two enquired about the number of hours worked per week, the number of patients seen per week, and the frequency of standardised outcome measures usage by the study participants.

Agyenkwa and colleagues (2020) advertised the study commissioning on social media platforms of the Ghana Physiotherapy Association (GPA) for those physiotherapists that were interested to participate in the study. 120 physiotherapists showed keen interest to take part in the study out of 165 physiotherapists registered and applying their trade in Ghana. The researchers used emails to reach the participants, and electronic data was collected using Google forms. Returned responses were analyzed using SPSS. Frequencies, cross tabulations, and Chi-Square tests were done with the level of significance placed at $p<0.05$.

Agyenkwa et al.'s (2020) study found that more than half of the participants, 55 (52.4%), reported that there were no recommended outcome measures in their facilities that were specifically for stroke rehabilitation patients. Furthermore, they found that the majority of respondents, 31(29.5%), did not use outcome measures in any of their stroke patients' rehabilitation. A greater significance between use of rehabilitation outcomes and recommended stroke rehabilitation outcome measures in the facility was found. Facilities that made recommended rehabilitation outcome measures and made them readily available recorded a greater use of outcome measures, 46 (43.8%), contrary to those facilities which did not have recommended outcome measures, 30 (28.6%).

Another study by Demers and others (2019) was conducted across two countries, in Canada and India. The study investigated the factors and barriers influencing the use of standardised outcome measures by physiotherapists with an interest in neurological rehabilitation in both developed and developing countries. Using a cross-sectional web-based survey design, a self-reported questionnaire method was opted for, with the attempt to reach a maximum number of respondents. Convenient sampling targeting physiotherapists with no exclusion criteria prevailed in this study.

Demers et al. (2019) managed to reach 547 participants in both countries, out of 4088 questionnaires sent to Canada and 2561 sent to India. The questionnaire was developed by experts in the field from both India and Canada, and peer-reviewed by 65 physiotherapists, which engagements were necessary to determine a clear timeline of stakeholder consultations. A full questionnaire composed of four sections, with 24 items was formulated as a data collecting instrument.

The first section had 10 questions that indicated profession, level of training, clinical experience, and the type of patients treated. The second section of the questionnaire investigated the working environment. The third section used the 4-point Likert scales to look at the use of standardisation in the assessments of neurological conditions: always; often; sometimes; and never. With regard to the influences over the use of outcome measures, they ranked the facilitators out of 10, and barriers out of 8.

Percentages were calculated for the most reported facilitators and barriers, and to compare both countries a two-proportion Z-score test was done. The analysis of Demers et al. (2019) revealed that facilitators influencing the use of outcome measures in Canada were 25% of physiotherapists who used the outcome measures with the "known validity and reliability", compared to India's where just above 15% agreed that this is a facilitator.

About 18% of Indian physiotherapists said that they use outcome measures that are "quick and easy to administer" and less than 10% of Canadians confirmed the same sentiment. More Indians reported that they used "inexpensive outcome measures" and the ones they "learned from their professional training". In both countries, the "mandatory" use of outcome measures was less than 10 percent. The two leading barriers in both countries were "cost" and "lack of time" to complete these outcome measures; 19 % of Indian therapists complained of the cost incurred from using outcome measures compared to 7% of Canadian therapists. More than 30 % of Canadians indicated that lack of time is the contributing barrier and less than 25% of Indians shared the same view (Demers et al., 2019).

Richards et al. (2019) undertook a mixed-method study in Canada that examined adherence to the Standardised Assessment Toolkit (SAT) for sensorimotor rehabilitation post-stroke. The study involved patient records and multidisciplinary teams of clinicians. The study was divided into two parts, the first part drew discussions by different stakeholders of researchers, rehabilitation managers, and clinicians about relevant outcome measures that would form the SAT at the three chosen research sites. The second part involved monitoring differences in adherence usage of SATs by rehabilitation multidisciplinary teams. The multidisciplinary teams included physicians, nurses, occupational therapists, physiotherapists, speech and language therapists, and nutritionists. They agreed on appropriate SATs focusing the priority on the outcome measures assessing sensorimotor impairments, and function, but other tools assessing swallowing and cognitive function were also accommodated (Richards et al., 2019).

In the research by Richards et al. (2019), descriptive statistics mean, and Standard Deviation (SD) were used to analyse the results. The outcome of this research produced 25 SAT assessment toolkits, inclusive of other tools for accommodations. Furthermore, monitoring adherence to the usage of SAT showed 75% to 97 % adherence both on admission and discharge of patients. Also, adherence to data logging drawn from patient records improved. Different tools (instruments) adherence depicted differences amongst therapists' disciplines.

It can be concluded that developing countries and developed countries can benefit from sharing experiences and devise strategies to facilitate transferring and sharing of knowledge. Balancing the process of rehabilitation, the type of rehabilitation outcome measure required to indicate the effectiveness of rehabilitation, and patient readiness to be reintegrated into the community, it was the aim of this study, to evaluate the usage of the activity (disability) outcome measures category to be included as a data collecting instrument.

Notably, a lot of work has been done in South Africa by physiotherapy in the awareness and use of outcome measures (Inglis et al., 2008; Joseph & Rhoda, 2011), and in other countries such as Canada and India (Demers et al., 2018). The usage of rehabilitation outcome measures data collecting instruments are certainly not only limited to physiotherapists, but other clinical professionals also contribute towards achieving multidisciplinary team rehabilitation goal(s).

As a result, it was decided, for this study, to adopt a multidisciplinary approach, by including medical officers, nurses, physiotherapists, occupational therapists, speech and language therapists, psychologists, and social workers to participate in the study. A similar approach was adopted by Richards and others (2018) while studying adherence to standardised assessment toolkits post-stroke by multidisciplinary teams.

Section 2.5 connected the previous body of knowledge that has shaped the discourse around rehabilitation outcome measuring data tools awareness, use, or development, by reflecting on what has been done before and how it relates to the current research study. Firstly, by choosing a quantitative research strategy, the research cross-sectional design and some research procedures emanated from these previous studies. Secondly, the research questionnaire instrument was self-developed and the decision as to which variables to collect data on and the phrasing of questions was justified by these previous studies discussed in Section 2.5. Lastly, data resulting from these past studies will be used later on in a discussion chapter to confirm or contrast the current research findings, by linking them to this research’s objectives, thus providing legitimate bases of reference to previous research studies.

2.6. Usage of Rehabilitation Outcome Measuring Tools Evaluating Effectiveness of Treatment Programmes

Neuro-physical rehabilitation outcome measures are the subject of high importance in this research. Section 2.6, defines the rehabilitation outcome measuring tools, states their functions, and comments on the validity and reliability surrounding the use of these data collecting instruments. Five rehabilitation outcome measuring tools of interest are first listed and summarised in a table format and rehabilitation outcome measuring instruments are discussed, their indication of use, items tested, and scoring analysis.

Rehabilitation outcomes are features of immediate or long-term effects or results during or after a rehabilitation intervention has taken place. It is important to measure the effectiveness of rehabilitation, and the usage of rehabilitation outcome measures data instruments is crucial. Rehabilitation outcome measures are the tools used to collect data and measure the extent of change during and post-rehabilitation periods (Matthew & Teasell, 2013). Rehabilitation outcome measures data collecting instruments permit the grouping of therapeutic scores, clarify therapeutic results, and spell out risk measures (Hefford et al., 2011).

Myezwa and Van Niekerk (2013), Mji et al. (2013), and DOH (2015) FSDRS posit that there is poor rehabilitation data information that measures the effectiveness of rehabilitation services. Moving with the times and technology trends, South Africa should take its benchmark from the global north European, American, and Asian countries, as well as the countries of Australia and New Zealand, who have long moved to use rehabilitation outcome data collection (Hamilton & Granger, 1994; van der Putten et al., 1999; Colantonio et al., 2010; Galloway et al., 2013; Ammann-Reiffer et al., 2019; and Shirahama et al., 2020).

This is a policy matter for discussion which has the potential to add value towards improved rehabilitation data collection, as Hefford et al. (2011) and Matthew and Teasell (2013) all advise that administering standardised rehabilitation outcome measures data collecting instruments produce valuable uniform information, detailing therapeutic effectiveness and ensuring accountability resulting from evidence-based practice.

As discussed by Salter et al. (2013), Joseph and Rhoda (2011) mapped a group of rehabilitation outcome measures data collecting instruments from the ICF framework and explained that rehabilitation outcome measures data collecting instruments should be categorised according to the domains of disability and rehabilitation, meaning there are separate measures for impairments and activities, and different measures for participation. This is because some measures are not absolute but overlap across domains.

In this study, activity limitation outcome measures were chosen as being a category of interest to include in the research questionnaire. This was because activity limitation measures real-time function improvements in Activities of Daily Living (ADLs), such as cooking or making phone calls, contrasts with impairment measures which, as noted by Salter et al. (2013), measure things like elbow range of movement (ROM) or muscle strength, which are not functional movements if they are not purposefully orientated.

In addition, activity limitation measures are the continuum linkages to participation restriction, meaning the person with disabilities will need to attain activities of daily living, or alternative measures should be provided to achieve meaningful participation in a social environment setting (Salter et al., 2013; Watermeyer et al., 2006). This bridges the gap between integrating the hospital institution environment into a communal situation environment. Table 2.1 provides a summary of chosen rehabilitation outcome measures, namely: (I) Functional Independent Measure (FIM); (ii) Barthel Index (BI); (iii) Frenchy Activity Index (FAI); (iv) Modified Rankin Scale; and (v) Nottingham Extended Activity of Daily Living Scale (Josephs & Rhoda, 2011). These are all traceable within the ICF framework (WHO, 2001).

Table 2.1.Summary of five (5) Chosen Rehabilitation outcome measures at the level of Activity Limitation.

Table 2.1: Summary of five (5) Chosen Rehabilitation outcome measures at the level of Activity Limitation

Outcome Measure	**Indication for use**	**Previous studies' usage (validity & reliability**	**Items assessed**	**Scoring analysis**	**Interpretations of the scores**
Functional Independent Measure (FIM)	Determining motor and cognitive scoring. Achieving sensitivity and comprehensiveness. Provision of a uniform system of measurement in disability	Reliability of 0,95 is reported and the test-retest of 0,95 was found. Validity association with BI (r=0,074 in admission) and BI (r=0,92 on discharge) (Thompson, 2001).	Measures18 items. 6 areas of i) self-care, ii)sphincter control, iii) mobility, iv)locomotion, v) communication and vi)social cognition.	7-point Likert scale.	A score of 18 indicates total dependence and 126 indicates complete independence
Barthel Index (BI)	Measures the level of independency in Activity of Daily Living (ADLs) performance. Developed to measure the abilities of patients with musculoskeletal or neuromuscular challenges	Test-retest reliability of r=0,98 and great construct validity expression compared to SF-36 form (Wilkinson et al., 1997)	Measures mobility, self-care, bladder, and bowel function	Contains 10 activities of daily living. Eight items on personal care activities. Two deals with mobility	The highest achievable is out of 100. The higher the score the greater the functional independence (MacDowell & Newell,1996)
Frenchay Activity Index (FAI)	Aim at 3 factors domestic chores, work, and outdoor activities independence	A test-retest of 0.90 reliability and greater concurrent validity compared to BI and FIM	15 activities are measured. Spread around 3 factors domestic chores, work, and outdoor activities.	A total score of 15-60. 4-point scoring.	1 is the lowest function and 4 is the highest score. The higher the score out of 60 the more independence
Modified Rankin Scale (MRS)	Measures global outcomes scaling of disabled patients' post-stroke (Rankin, 1957)	Reported the intra-rater reliability of 0,95, when compared to BI (Wolfe, Taub, Woodraw & Burney 1991).	The MARS scale looks at 5 categories of items	Measuring from 0 to 5	0 measures no symptoms and 5 is grading the greatest severity of disability (Swieten et al., 1998)
Nottingham Extended Activity of Daily Living Scale (NEADL)	Measures the level of ADL independence post-discharge in the health facility.	No unclear criteria of grading that diminishes reliability. Broad categories are too broad to define (Salter et al., 2013, Joseph & Rhoda, 2011).	The self-administered questionnaire that monitors 21 activities	Four-point Likert scale. Takes approximately 10 minutes	

2.6.1. Functional Independent Measure (FIM)

FIM was created in 1987 to respond to the shortcomings emanating from the Barthel Index's low sensitivity in some aspects of disability. The aim of this measuring tool is to assist in determining the physical (motor) and cognitive burden of care (Salter et al., 2013; Joseph & Rhoda, 2011). The FIM measure contains 18 items covering 6 areas: i) self-care; ii) sphincter control; iii) mobility; iv) locomotion; v) communication; and vi) social cognition. All the 18 items are scored using a 7-point Likert scale, where a score of 18 indicates total dependence, and 126 indicates complete independence.

Observation of reliability of 0,95 is reported and the test-retest of 0,95 was found. At the same time, validity proved a convincing association between BI (r=0,074 in admission) and BI (r=0,92 on discharge) (Horbat and Thompson, 2001). Furthermore, FIM acts as an effective measuring tool for use in the medical remuneration system in compensation for healthcare providers and funders (Salter et al., 2013). There is no published reported data for use in South Africa.

2.6.2. Barthel Index (BI)

The Barthel Index outcome measuring tool was developed around 1955 (Mahoney, 1965). This tool measures the level of independency in Activity of Daily Living (ADLs) performance. Mobility, self-care, and bladder and bowel function form part of the areas covered, as well as patients with neuromuscular and or musculoskeletal problems (Salter et al., 2013). BI contains 10 familiar activities of daily living.

Eight items focus on personal care activities and the other two deal with mobility. The highest score that is achievable is out of 100 and the higher the score the greater the functional independence (MacDowell & Newell,1996).

The test-retest reliability of r=0,98 is reported, and great construct validity expression compared to the SF-36 form (Wilkinson et al., 1997). The shortfall of BI is less sensitivity and short of comprehensiveness in identifying slight changes in patients with mild stroke. BI is criticised for its significant ceiling effect (Salter et al., 2013; Joseph & Rhoda, 2011). This tool has been used in South Africa, as reported by Puckree et al. (1997).

2.6.3. Frenchay Activity Index (FAI)

The Frenchay Activity Index (FAI) measures Activities of Daily Living (ADL) (Joseph & Rhoda, 2011) and items of focus in this instrument involve a range of activities extending beyond ADLs (Salter et al., 2013). In FAI, 15 activities are measured, spread around three factors: domestic chores; work; and outdoor activities. A total score of 15-60, uses a 4-point scoring, where 1 is the lowest function and 4 is the highest score. The FAI is conducted in an interview format that takes approximately five minutes to complete and allows proxy usage.

A test-retest produces a score of 0.90 reliability and greater concurrent validity compared to BI and FIM. Careful consideration of gender sensitivity between males and females requires separate scoring (Salter et al., 2013; Joseph & Rhoda, 2011). The FAI has been used in South Africa, as reported by Joseph and Rhoda (2011) through personal interaction with J.A Hendry in 2010.

2.6.4. Modified Rankin Scale (MRS)

The Modified Rankin Scale (MRS) was developed in 1957. It measures global outcomes scaling of disabled patients (Rankin, 1957). Wolfe, Taub, Woodraw and Burney (1991) reported the intra-rater reliability of 0,95 when compared to BI. Great validity is confirmed by Cup et al. (2003). The scale proves five categories of items, measuring from 0 to 5, where 0 measures no symptoms and 5 grades the greatest severity of disability (van Swieten et al., 1998).

The limitation of MRS is the unclear criteria of grading that diminishes reliability, because of its categories that are too broad to define (Salter et al., 2013; Joseph & Rhoda, 2011). MRS takes approximately 15 min to complete and is conducted face-to-face or telephonically.

2.6.5. Nottingham Extended Activity of Daily Living Scale (NEADL)

NEADL measures the level of ADL independence post-discharge. It is a self-administered questionnaire that monitors 21 activities, using a four-point Likert scale, which usually takes approximately 10 minutes, and no training is required (Joseph & Rhoda, 2011). NEADL goes beyond assessing simple ADLs but extends to broader activities interlinked with community rehabilitation integration. Mobility, house chores, domestic activities, and leisure activities are assessed (Salter et al., 2013).

Nicholl, Lincoln and Playford (2002) reported inter-rater reliability data measured through ICC:0,88 and Harwood and Ebrahim (2002) said NEADL showed a poor response when compared to BI and FIM. No literature has provided data specific to the reliability or sensitivity of NEADL (Joseph & Rhoda, 2011).

Moreover, within neuro-physical rehabilitation there is a wide range of outcome measurement tools, but the study focused on the five, FIM, BI, MRS, FIA and NEADL, in developing this research conceptual framework. All the tools use similar rating, the Linkert scales. The usage of the tools had been widely researched within the country and internationally therefore, are found to be reliable to be used with regard to the South African health professionals who provide neuro-physical rehabilitation in the healthcare sector, to determine the effectiveness of neuro-physical rehabilitation programmes. Although some rehabilitation outcome measures are profession specific, and rehabilitation condition specific, and cannot fit well in use by multidisciplinary teams, this fact should be acknowledged and be catered for when selecting rehabilitation outcome measures to use in the multidisciplinary team. Other OMs such as FIM have been modified to meet the needs of the nursing community, for example, in South Africa, the BETA outcome measure is a result of such process and is licensed and used by rehabilitation multidisciplinary teams (Loubser & Casteleijn, 2013).

2.7. Theoretical Framing: Public Policy Evaluation-Monitoring and Evaluation in a Context of Rehabilitation Healthcare

When introducing rehabilitation healthcare to management, tools such as: undertaking problem analysis; objective analysis; alternative analysis; Theory-of-Change (TOC); results chain; results framework; and some monitoring and evaluation processes; it is imperative to align and focus on the specific goal (Wotela, 2017a; NORAD,1999; Kusek & Rist, 2004). Important to these processes are the systems thinking tools alluding to rehabilitation data collection trend analysis, rigorous problem-tree scrutiny processes with different stakeholders, and the Theory of Constraints (TOC) (Wotela, 2017a). The TOC must look at the readiness of the public health capacity to implement data collection concerning rehabilitation outcome data measuring instruments use.

Mark Moore’s (2013) public value theory of management articulates that it is the efforts that are produced by consuming public resources, in the form of inputs, outputs, and outcomes, that realise the collective desired social outcome. Moore (2013, p 11) says "public agencies should be called to account for producing value by developing a clear, explicit and measurable public value account that names the important dimensions of public value to be pursued by and reflected in the operations of the government agency and enumerate the social and financial cost incurred along the way".

This statement by Moore (2013), perfectly resonates with the aim of this research which, drawing on the work of Milovanovitch (2018), sought to ascertain clear and explicit rehabilitation outcomes by monitoring data collecting instrument(s) that supply verifiable means of information offering accountability for rehabilitation program outcomes. This is a rehabilitation policy matter for interrogation in the Theory-Of-Change.

This public value approach functions as a strategic performance management model that strengthens accountability by reporting effectiveness and demonstrating financial, political, cultural, and social value (Moore, 2013; & Moore, 1995). Moore (2013 provides three characteristics of public value recognition, see Figure 2.4, below.

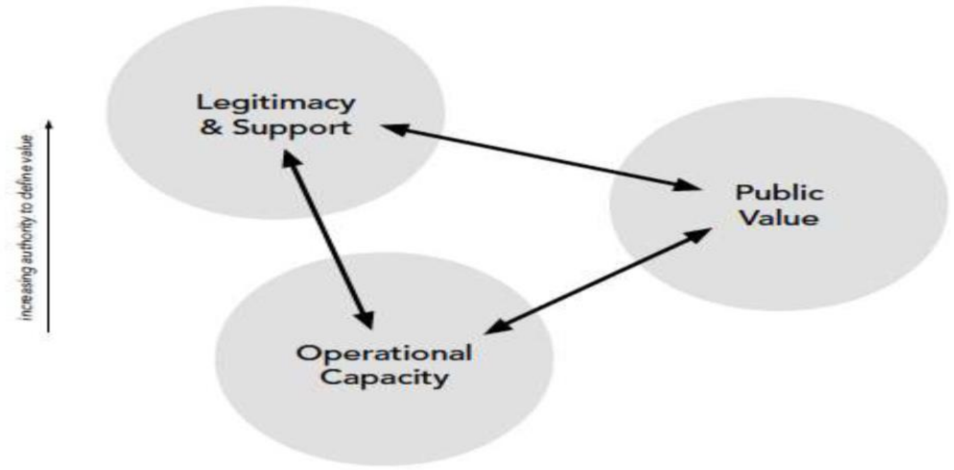


Figure 2.4:Diagram is from Mark Moore (2013). "Recognising Public Value, Developing a Public Value and a Public Value Scorecard".

Firstly, *Legitimacy & Support*, which in this study refers to policymakers, treasury, auditor general, political oversight, executive management, healthcare managers, and rehabilitation provincial managers. Supporting the ideals of monitoring and evaluation requires this authorising environment to throw weight behind the institutional and organisational arrangement, in implementing departments (Porter & Goldman, 2013; Baradei et al., 2014).

Secondly, is the *Operational Capacity* that talks to the readiness of the healthcare system in KZN and GP provinces to provide staff with resources. Resources such as mandating and managing data collecting instruments, training therapists to improve data collection capacity, providing sufficient human resources, and evaluating subsequent performance. Evaluation Capacity Development (ECD) has been recognised as an intervention that leads to the strengthening of evaluation capacity, often translating and responding to the demand for credible evidence (Morkel & Ramasobama, 2017). Linkages that promote cross-learning between private-public partnerships, using case studies and information sharing platforms, enhance strong collaborative policies aimed at learning (Measure Evaluation, 2017).

Thirdly, is the *Public Value* discharging mandate which is the provision of rehabilitative healthcare for the benefit of the general South African public and thereby producing an indication of rehabilitation progress or regress.

The Results-Based Management (RBM) approach is used as a governance tool that focuses broadly on the effectiveness and efficiency in achieving results in public, private, and non-governmental organisations (Wotela, 2017b; Kusek & Rist, 2004). Its strength is based on organisational performance, and the ability to plan and make decisions based on the best evidence practice available (Kusek & Rist, 2004).

The public health sector is not spared in having to demonstrate accountability, transparency, and fairness in the provision and coverage of rehabilitation services. Although Kusek and Rist's (2004) work is influential within the broader field, questions arise about whether it is applicable within diverse African cultures (Crawley, 2017). Therefore, various African scholars, including Mapitsa, Tirivanhu and Pophiwa (2019), Morkel and Ramasobama (2017), Wotela (2017b), and Crawley (2017), have written to some extent conceptualising the African evaluation capacity landscape shaping public policy development. These writers allude to the failure of individual institutions to collaborate with institutions of higher learning to work together with the goal to align evaluation skills capacity development competencies (Mapitsa & Khumalo, 2018).

Verguet et al. (2019) and Wotela (2017b) advocated for the systems thinking methodology when managing public health systems. Rigorous health policy strengthening requires research designs that evaluate comprehensive interventions across multiple health systems, settings, and components (Adam et al., 2012).

The systems thinking approach acknowledges that interventions are complicated, complex, and contain dynamic interactions that affect multiple policy levers. Linking monitoring and evaluation in the rehabilitation policy cycle initiates rigorous use of the TOC, how the change will take place, and the diagnostic and formulation evaluation stages (Rogers, 2008; Wotela, 2017b). Therefore, TOC will assist in understanding the contextual factors surrounding disability and rehabilitation and propose pathways toward results.

In assessing rehabilitation services within a health system, Gutenbrunner and Nugraha (2018) have suggested the use of monitoring and implementation of health services articulated by the WHO as relevant for monitoring and evaluation of (new or additional) rehabilitation services. The WHO’s (2014) Global Disability Action Plan 2014-2021 (GDAP), Figure 6, recommends the following domains. Firstly, governance and financing as vital resources that should preexist for rehabilitation service delivery inputs. Secondly, infrastructure technologies, which in this research, are expressed as data

collecting instruments tools, the capacitated workforce to facilitate data collection, supply chain, and rehabilitation information coordination inputs.

Thirdly, the rehabilitation intervention quality assessment, readiness to produce monitoring and evaluation information, and public service provision outputs. Fourthly, the comprehensive delivery of rehabilitation services and the extent of impairment outcomes. Fifthly and lastly, increased life span, quality of life, and equity of social welfare provision impact. The South African public health system has not aligned rehabilitation services in such a way that it tracks the progress of rehabilitation outcomes as suggested by GDAP (DSD, 2015; Myezwa & Van Niekerk, 2013; Mji et al., 2013).

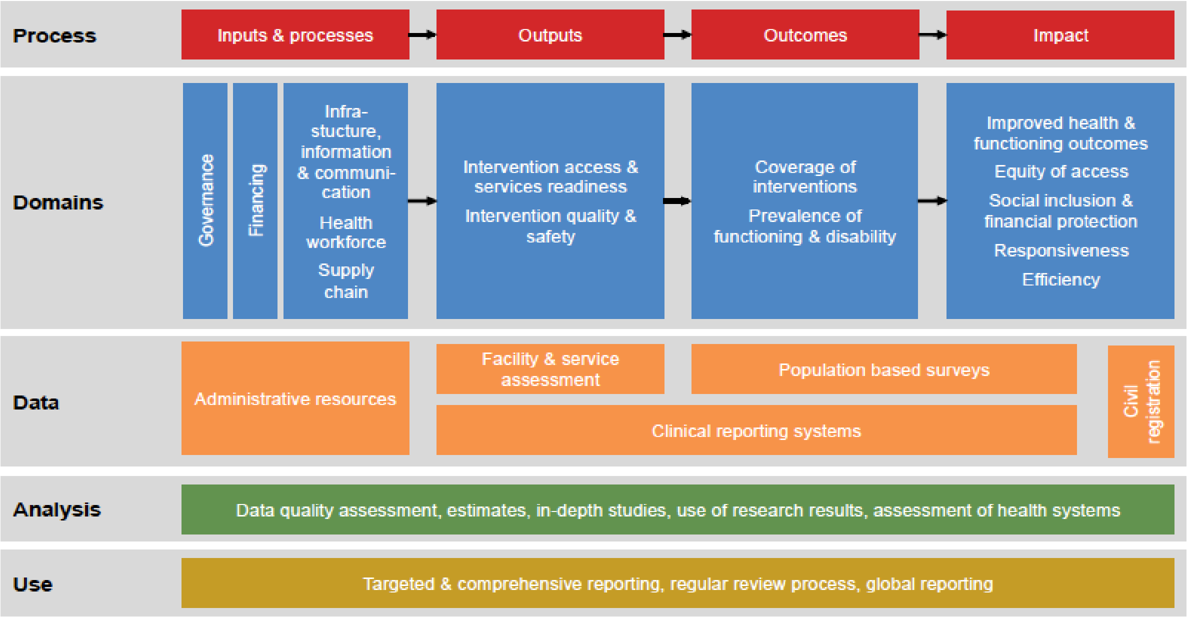


Figure 2.5:Principles of Monitoring and Evaluation of Health Systems Strengthening (From WHO 2009-Modified by Gutenbrunner, 2017)

This section aims to attend to the bigger challenge of poor rehabilitation indicators development. As a result, rehabilitation data is limited and not usable for resources planning. Collected data needs to be appropriate and requires collating, analysing, and packaging before use; however, this skill capacity to monitor and evaluate data appears to be missing. This section forms the second leg of the research's conceptual framework, which introduces and motivates for the use of monitoring and evaluation

(M&E) management tools for strategically planning how change could take place moving forward. In this research data collecting instrument, questions regarding the healthcare facilities' readiness to monitor and evaluate data collection, resources provision, evaluation capacity development, availability of M&E champions and data governance were developed as a result of literature reviewed in this section.

2.8. Linking research objectives to literature reviewed: As the ICF Framework and Monitoring & Evaluation Framings concludes this Research Theoretical Framework

Chapter 1, Section 1.6 presents the research study objectives, which draw on the literature reviewed, using it as a foundation for the collection and interpretation of the research data, and the discussion of the results of the current study. It is critical that research results have linkages back to the past studies theory reviewed. This section motivates for why the research objectives were developed and how they assist in responding to the research questions. After consideration of the literature reviewed, the following research objectives were developed.

Research Objective 1 makes linkages with Section 2.3 of the literature review

Ascertaining provision of rehabilitation outcome measuring instruments by the institution. Research Objective 1 responds to the assertion that identified the lack of rehabilitation data collection (Mji et al., 2013; Myezwa & Van Niekerk, 2013; DOH, 2015). The ability to collect data is enhanced by the provision of resources such as data information collecting tools. Therefore, the provision and the readily available standardised rehabilitation outcome measures facilitate and strengthen data collection, hence improving accountability measures. If rehabilitation outcome measures are not provided, it will prove difficult to ascertain the effectiveness of the rehabilitation intervention. With this said, it was deemed necessary to develop an objective that evaluates the provision of rehabilitation outcome measures by the healthcare facility. This objective assisted in collecting data information from the research participants, and the objective will further depict the results in Chapter 4 and be utilised in the results discussion in Chapter 5.

Research Objective 2 is linked to Sections 2.5 and 2.7 of the literature review

Assess data governance, quality, and appropriateness. Research Objective 2 is encompassed by the need to assess how often data collection takes place, how data is packaged, and for what reasons it is collected. Inglis et al.'s (2008) study assisted in developing a question about what kind of data is collected, and for what purpose: "effective clinical practice" or "evidence-based practice"? This question was adopted in the current study with further sub-questions related to evidence-based decision-making. Also, the need for tools assessing barriers preventing the use of rehabilitation outcome measures came from Richards et al.'s (2019) work as referred to in Section 2.5. Section 2.7 alludes to routine collection of data which assists in monitoring progress (Kusek & Rist, 2004), and the use of data to improve performance (Measure Evaluation, 2017).

Research Objective 3 is closely linked to Section 2.7 of the literature review

Assess Monitoring & evaluation data collecting capacity. Objective 3 of the research addresses the gap that expresses the largely unknown capacity to monitor and evaluate the data collecting process. Review of literature from scholars such as Morkel and Ramasobama (2017) highlighted the need for Evaluation Capacity Development (ECD), so that evidence leading to decision-making could be enhanced. However, it further pointed out that some individual institutions fail to address this issue of evaluation skills capacity development, as they lack engagement with higher learning institutions and a common understanding of the required evaluation competencies (Mapitsa & Khumalo, 2018). Bateman (2012) identifies a lack of funding that provides managers and therapists with necessary skills development, especially in public healthcare facilities. Furthermore, Gorgens and Kusek (2010) stress the importance of funding skills capacity development programmes to strengthen data collection, collating, analysis, and use, to make the M&E System function properly.

Research Objective 4 connects with Section 2.7 of the Literature Review.

Evaluating rehabilitation data use, and resources sharing, dissemination and promotion. Objective 4 is rooted within Section 2.7 of the literature review, in which learning through case studies, mapping data sources for outcome harvesting, and utilising data to make an impact reaching all stakeholders is advocated (Measure Evaluation, 2017). Development of policies and Standard Operating Procedures, and using guidelines create a good organisational culture and institutional learning memory. Furthermore, directed, and cross-learning through private-public collaboration enhances opportunities to improve rehabilitation healthcare services (Measure Evaluation, 2017).

Research Objective 5 makes linkages with Sections 2.5 and 2.6 of the literature reviewed.

Determine knowledge, use, and sources of education about rehabilitation outcomes measuring instruments. Objective 5 of the research study draws on the ICF framework by putting into perspective the understanding of disability and rehabilitation, further identifying the five-rehabilitation outcome measuring instruments as they are outlined by the ICF (WHO, 2001). The use of the five rehabilitation outcome measures is further validated by Salter and others (2013). Joseph and Rhoda (2011) also did a systematic review of these rehabilitation instruments earlier on, confirming their validity and reliability. Inglis and colleagues (2008) and Agyenkwa et al. (2020) earlier raised the issues about rehabilitation outcomes awareness, use, and sources of education, and this research responded to this.

Section 2.8 serves the purpose of linking the literature reviewed to the research objectives as they are articulated in Chapter 1. The research objectives form the third and final leg, concluding the conceptual framework development of this research. Research objectives will later be used in Chapter 5 to discuss the analysed research findings. Each section of the research objectives has been linked to either one or more parts of the literature reviewed. The overall aim was to appropriately and adequately attend to the research questions.

2.9. Evaluating Rehabilitation Outcomes Measuring Data Instrument usage across Rural Kwazulu-Natal, Urban Gauteng Public-Private Healthcare Study explanatory framework.

Section 2.9. provides a road map for this research, following the introduction to the research problem stated as: “The unknown or no use of rehabilitation outcome measuring data instruments”. An explanatory framework summary is developed outlining the discussion process followed in Chapter 1 (the introduction) and Chapter 2 (the literature review), in an effort to understand the problem.

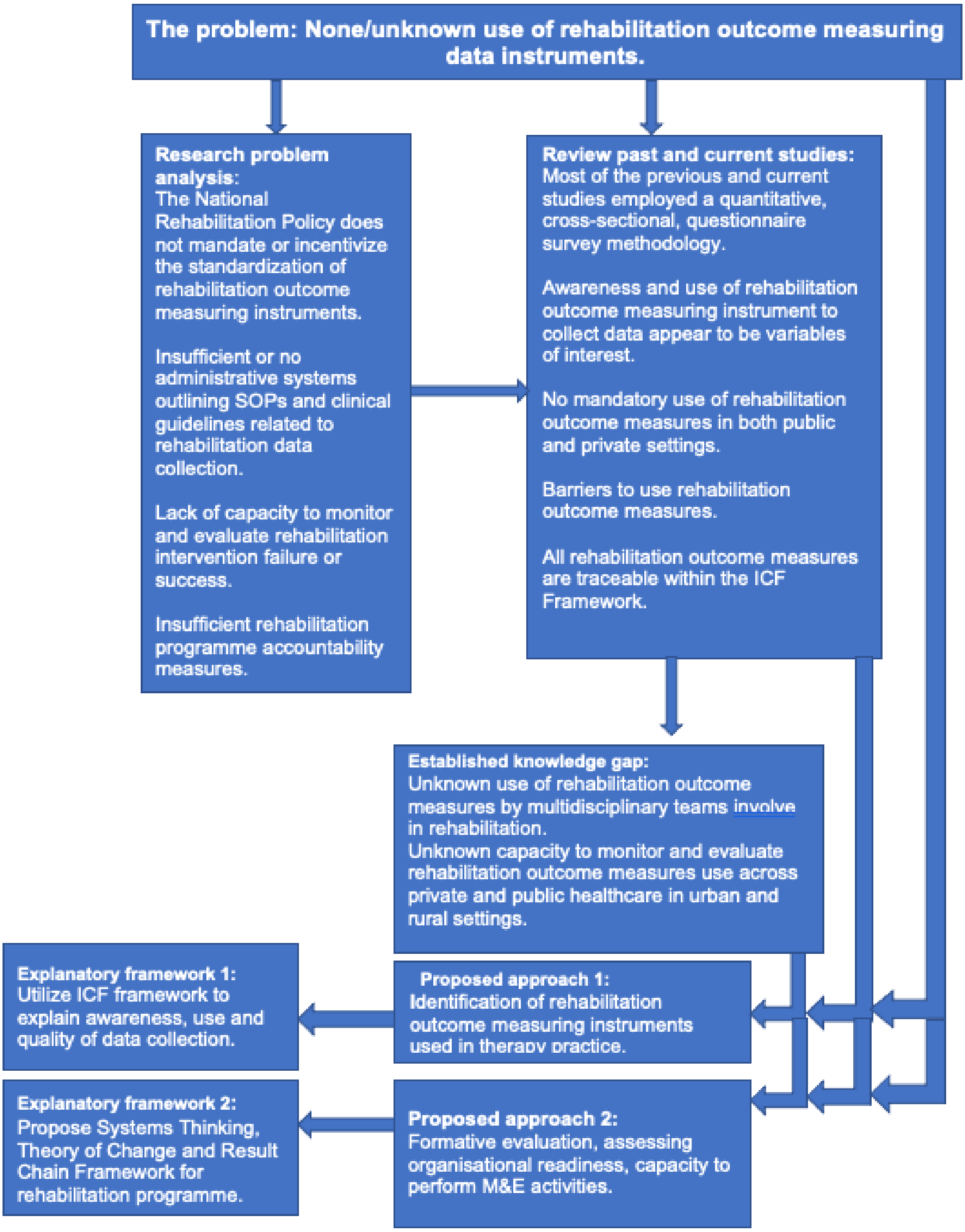
Figure 2.6 depicts how the problem statement is linked to the research questions and literature review. Firstly, in Section 2.3. the research problem analysis is outlined, placing the challenge on the National Rehabilitation Policy, which does not mandate or incentivise the standardisation of rehabilitation outcome measuring instruments used, as the root course of the problem. There is an understanding that usually national policies are broad and overarching, but it is not clear whether attempts have been made to narrow down the rehabilitation program to specific needs. As a result, there are insufficient or no administrative systems outlining SOPs, or clinical guidelines for rehabilitation outcomes measuring data instrument usage. The inability to identify and use rehabilitation outcome measures has led to insufficient rehabilitation program accountability measures and suppressed monitoring and evaluation capacity development.

Secondly, Section 2.5. looked at the previous and current work conducted on a similar subject, and evidence indicates that many researchers opted to conduct a quantitative cross-sectional approach and used surveys for data collection. Challenges that constitute variables of interest include awareness, use, and the outline of rehabilitation outcome measuring instruments assisted in gathering information. Barriers and facilitators such as time, availability of rehabilitation instruments, the choice to use instruments, and mandatory pressure exerted by higher authorities to account are observed. Section 2.4. assisted in understanding what is disability as a field of study, and it is through section 2.4.2.1. where the International Classification of Functioning, Disability, and Health (ICF) is further explained and elected as being the sound disability framework where rehabilitation outcomes data measuring instruments are advocated by this research.

Thirdly, the main focusing issues of concern are covered in Section 1: the introduction, covering the background of the study, the problem statement containing the research gaps, research questions, and purpose of the study; and Section 2.3. further supply detailed information on the literature consulted to identify these gaps. Two major gaps that were identified assert that (i) there is unknown usage of rehabilitation outcome data measuring instruments by the rehabilitation multidisciplinary teams, both in public and private healthcare and in the settings of rural and urban; and (ii) the monitoring and evaluation capacity to collect, collate, analyse, package, and use data as evidence contributing to decision-making is largely unknown.

Lastly, the available evidence qualifies the ICF framework as a worldwide accepted approach in which there is a common language of understanding disability, using rehabilitation interventions and utilisation of rehabilitation outcomes data measuring instruments as a method to qualify or disqualify rehabilitation success.

It can be argued that the governance of rehabilitation programs should largely incorporate management tools that will facilitate the undertaking of the formative evaluation exercise. In this way, a Theory of Change (TOC) and Result Chain Framework may produce a systemic way of thinking about impactful data collection and inform decision-making in future and beyond this research.



The problem: None/unknown use of rehabilitation outcome measuring data instruments.

Research problem analysis:
The National Rehabilitation Policy does not mandate or incentivize the standardization of rehabilitation outcome measuring instruments.

Insufficient or no administrative systems outlining SOPs and clinical guidelines related to rehabilitation data collection.

Lack of capacity to monitor and evaluate rehabilitation intervention failure or success.

Insufficient rehabilitation programme accountability measures.

Review past and current studies:
Most of the previous and current studies employed a quantitative, cross-sectional, questionnaire survey methodology.

Awareness and use of rehabilitation outcome measuring instrument to collect data appear to be variables of interest.

No mandatory use of rehabilitation outcome measures in both public and private settings.

Barriers to use rehabilitation outcome measures.

All rehabilitation outcome measures are traceable within the ICF Framework.

Established knowledge gap:
Unknown use of rehabilitation outcome measures by multidisciplinary teams involve in rehabilitation.
Unknown capacity to monitor and evaluate rehabilitation outcome measures use across private and public healthcare in urban and rural settings.

Proposed approach 1:
Identification of rehabilitation outcome measuring instruments used in therapy practice.

Proposed approach 2:
Formative evaluation, assessing organisational readiness, capacity to perform M&E activities.

Explanatory framework 1:
Utilize ICF framework to explain awareness, use and quality of data collection.

Explanatory framework 2:
Propose Systems Thinking, Theory of Change and Result Chain Framework for rehabilitation programme.

Figure 2.6:Diagram outlining the research explanatory framework, stating the problem statement, the literature reviewed, chosen methodology to tackle the problem, and available explanations.

2.10. Conclusion

The South African healthcare system setting, and its financing has continued to display extreme disparities and inequalities in the structural composition of society. Public healthcare is overlooked by the National DoH, whilst the private health sector is managed by the independent Council for Medical Schemes which through medical aid schemes funds private healthcare providers.

There are stubborn disease manifestations in South Africa that continue to further burden the healthcare system and are competing with disability and rehabilitation. The NHI proposes fund-pooling strategies that use a single fund aimed at addressing challenges of escalating cost, human resource inadequacies, and improved access to healthcare services.

Developing countries and developed countries alike can benefit from sharing experiences and devise strategies to facilitate the transferring and sharing of knowledge. Balancing the process of rehabilitation, the type of rehabilitation outcome measures required to indicate the effectiveness of rehabilitation, and patient readiness to be reintegrated into the community is critical.

The ICF upholds the view that environmental factors perpetuate or alleviate disability by presenting or removing barriers. Furthermore, it is recognising the voices of persons with disabilities and people with disabilities' civil organisation through the Social Model of disability, which cements the comprehensive understanding of disability. The Medical Model associates the concept of disability with seeking to manage impairment and the facilitation of the activities of daily living within the health facilities.

There is evidence that qualifies the ICF framework as a worldwide accepted approach where there is a common language of understanding disability, using rehabilitation interventions, and the utilisation of rehabilitation outcomes data measuring instruments as a method to qualify or disqualify rehabilitation success. Evaluation Capacity Development (ECD) has been recognised as an intervention that leads to the strengthening of evaluation capacity, often translating and responding to the demand for credible evidence.

CHAPTER 3: METHODOLOGY

3.1. Introduction

The methodology section discusses the research procedures and methods (Wotela, 2017c) proposed by the study. These included the study context, research strategies and design, and research procedures. Methods for data collection, data analysis and reporting are discussed before the dissemination of the results.

Different health care professionals provide neuro-physical rehabilitation for their clients guided by their scope of practice (Bruyere, VanLooy and Peterson, 2005). All have one goal in common, which is to provide effective neuro-physical rehabilitation which promotes gaining of survival skills that allows the individuals to continue to live in the community upon end of neuro-physical rehabilitation. It is worth noting that each profession uses different methods guided by their professional treatment principles, protocols, and frameworks when attending to the client or service users' needs of neuro-physical rehabilitation. In most cases, therapists working in hospital settings usually work in a multidisciplinary team and instruments they use require this type of collaborative environment. Most researchers who have studied rehabilitation outcome measures instruments have used a quantitative approach, but neither focusing on multidisciplinary teams nor on the private-public setting, and furthermore, not across provinces with unequal resource availability in a country such as South Africa. It against this background that this study adopted a quantitative research methodology.

The research was situated within the positivist paradigm. A quantitative research strategy was used, which implied the quantification of collected, processed, and analysed empirical data (Bryman, 2016). Following Bryman (2016) and Neuman (2014), a deductive approach that detailed the theory behind rehabilitation outcome measures data use and evaluation capacity development policy framework determined the variables that were important to investigate in the research study.

3.2. Research Design

A cross-sectional, survey research design was used. This type of design provided the opportunity to collect once-off data from the defined sample (Bryman, 2016). According to Bryman (2016), the defining feature of a cross-sectional study takes shape when a snapshot of different population groups at a single point in time is examined; and in this case, multidisciplinary rehabilitation teams from different research settings were compared in more than two variables.

3.3. Research Procedures and Methods

3.3.1. Study Context and Targeted Population

A sample, consisting of rehabilitation multidisciplinary teams (RMTs) of seven (7) members in public and private hospitals, composed of medical officer(s), nurses, clinical psychologists, physiotherapists, occupational therapists, speech/audio therapists, and social workers, was included in this study as they were crucial in improving rehabilitation outcomes (Tederko et al., 2020; DOH, 2015).

A medical doctor and a nurse in a hospital working in each of the following wards: surgical, orthopedic, mental, neurological, medical, general wards, and outpatient departments (OPD) during the period of data collection were included in the study.

3.3.2. Research Location Sampling

Scholars such as Marinah (2013), Zhen et al. (2006), and Neupane and Thepa (2001) applied a quantitative cross-sectional research design, incorporating purposive sampling for villages meeting their inclusion criterion, before performing households' sampling. Similarly, in this study, the same two-staged method approach was followed, where the first step was purposive sampling of the research sites, and secondly, sampling the RMTs. Purposive sampling is a non-probability form of sampling, this type of sampling provides non-random basis meaning not all healthcare facilities in selected provinces have a chance to participate in the research study, thus prone to bias (Bryman, 2016). In addition, in the purposive sampling participants (in this case the research sites) are strategically chosen to respond to the research questions and related characteristics such as research objectives, the type of health facilities studied and the sample size limitation. The use of non-probability sampling means the researcher cannot generalize the research results to the entire community of the studied population (Neuman, 2014). This research contained elements of non-probability sampling, and therefore the findings/results of the study would not be generalised.

13 health facilities were approached, and data was collected in the following sequence: the first selection of research sites comprised four private rehabilitation hospitals in GP and one private hospital in KZN. The second selection of research sites comprised three public hospitals located in Ekurhuleni and City of Johannesburg districts around GP. The last selected research location comprised five public hospitals spread over three districts of King Cetshwayo, uMkhanyakude, and Zululand in the Northern KZN Province region.

In choosing the research sites, a non-probability purposive sampling targeting the 13 research sites was used. Firstly, the chosen research facilities complemented the characteristics that responded most appropriately to the research topic and questions, regarding their geographic landscape (rurality and urban nature), their provincial location (GP and KZN), and their ownership status (private and public). Secondly, the selection facilitated the testing of assumptions surrounding resources allocation in the 13 research contextual settings. It was decided to choose these facilities because of work experience, location familiarity, and pre-existing knowledge of conditions on the ground. The aim was to compare the diverse conditions that existed in relation to rehabilitation outcome measuring data instruments usage. Lastly, due to financial and time constraints it would have been impossible to sample all the facilities in KZN and GP. Furthermore, participation depended on whether the approached research facilities were willing to participate, the time taken to respond, the complexity in granting approvals and since this research was done for academic purposes, this meant there was a limited timeframe in which to complete it.

3.3.2.1. The overview of relevant healthcare practitioners in South Africa

The most appropriate method to estimate the total population of healthcare practitioners that could be involved in this research study was through their professional registration status per profession councils. These included: the South African Health Profession Act No 56 of 1974 (HPCSA, 2020/21); the Nursing Act No 33 of 2005 (SANC, 2022); and the Social Service Professional act of 1978 (SACSSP, 2022); which pieces of legislation guide the professions and mandate all practising professionals to register under the relevant professional bodies.

According to the HPCSA 2020/2021 register, there were: 48 021 medical practitioners; 9 125 psychologists; 8 343 physiotherapists; 5 876 occupational therapists; 1 638 speech therapists and audiologists; 1 401 speech therapists; and 835 audiologists (HPCSA Annual Report, 2020/2021). The Nursing Profession had 394 157 registrations in their South African Nursing Council register (SANC Statistics, 2021). Lastly, the South African Council for Social Services Profession (SACSSP) recorded 60 000 Social Services Professionals, 48 000 of those were qualified social workers and only close to 31 000 were practising as social workers (Skhosana, 2020).

Sampling from the above-mentioned population could have not yielded the required results because it consisted of a very large and diverse community of healthcare professionals' interests that were beyond the scope of this research study. The research was specifically focused on the rehabilitation multidisciplinary teams found only in public healthcare facilities, private rehabilitation hospitals in two provinces of GP and KZN. Due to the fact that the study was conducted for academic purposes, and prescribed for a limited period, it was not possible to sample all the RMTs found in all healthcare facilities in KwaZulu-Natal and GP. Therefore, the feasible option of sampling was per hospital population of the RMTs using Human Resource Development (HRD) records and Personal and Salary System (PERSAL) for the selected public hospital and employment registers for private rehabilitation hospitals. The disadvantage of this type of research design and sampling meant that although the results cannot be generalised, very important insights could nevertheless be gained regarding the studied community of RMTs.

3.3.2.2. Identification of the Participants

Firstly, a stratified sampling process was conducted with regard to the nursing and medical officers, categorising them according to profession and the ward/unit they were working in during the data collection period. Following Brynard, Hanekom and Brynard (2014), this was done only in public hospitals. To improve reliability, this was done to specifically target nurses and medical officers working in wards/units directly related to aim of the research. Secondly, from the strata sample, every nurse and medical officer working in surgical, orthopedic, mental, neurological, medical, and general wards, as well as in outpatient departments (OPD) were included.

Thirdly, in all participating hospitals' therapy units, all allied therapists were sampled in public hospitals, in accordance with sample size table calculations advised by Stoker (1985) and further mentioned by De Vos et al. (2002), who recommended that if the population size was 20 and less, a 100% sampling was suggested. In Brynard et al. (2014) book, Stoker (1985) and De Vos et al. (2002) further put forward that a population of 30 required at least 80% sampling of the respondents.

This was the case with the allied therapists (physiotherapists, occupational therapists, speech and audio therapists, psychologists, and social workers), and therefore all of them in the approached public hospitals were sampled. Lastly, in all approached private rehabilitation hospitals that participated in the research study, their population was less than 30 (including all rehabilitation multidisciplinary teams), and so it was decided to apply 100% sampling.

3.4. Sample Size

Of the thirteen (13) targeted hospitals, most had seven health professionals which constructed the research sample size (Tederko et al., 2020; DOH, 2015). Below, Table 3.1. explains the process followed during sampling of public healthcare medical officers and nurses. According to eight public hospitals (HRD) records both in KZN and GP, 189 medical officers (MOs) and 3594 nurses were a total population size constituting a sample frame. A stratified sample size of 91 MOs and 315 nurses was possible. After the stratified sample of MOs and nurses was achieved, then all the RMTs were subjected to 100 % sampling. Furthermore, there were 61 physiotherapists, 39 occupational therapists, 25 speech therapists, 12 audiologists, 17 clinical psychologists and 48 social workers, therefore, a total of 202 therapists' sample was possible for 100% sampling. In the eight public hospitals a total sample size of 608 participants was approachable.

Table 3.1.Population size and sample of RMTs in Public healthcare Facilities.

Public Hospital	Population size per HRD records		Stratified sample per specific Ward		100% sampling for possible research sample size								Total
	MOs	Nurses	MOs	Nurses	MOs	Nurses	PT	OT	SLT	AUD	PSY	SW	
H1	12	445	7	49	7	49	03	02	02	01	01	04	69
H2	15	292	7	35	7	35	04	01	01	01	01	03	53
H3	16	487	7	42	7	42	03	01	03	01	00	03	60
H4	18	364	7	28	7	28	04	01	01	00	01	04	46
H5	36	812	14	42	14	42	12	06	04	02	04	08	92
H6	38	510	21	42	21	42	12	08	04	02	03	10	102
H7	32	416	21	49	21	49	09	12	06	02	03	08	110
H8	22	268	7	28	7	28	14	08	04	03	04	08	76
Totals	189	3594	91	315	91	315	61	39	25	12	17	48	608

Healthcare facilities names are represented by letter H and the numbers 1 to 13 to adhere to non-disclosure agreements. In hospital H1, their HRD records showed that there were 12 medical officers (population size) employed by the hospital and one MO was present in each of the seven wards of interest; therefore, there were seven MOs in the stratified sample. In the same hospital HRD reported 445 nursing staff (population size) employment and each ward had seven nursing staff allocated to work on the seven wards of interest during data collection, totaling to 49 nurses in the stratified sample. There were three physiotherapists, two occupational therapists, two speech therapists, one audiologist, one clinical psychologist and four social workers.

Hospital H2 had 15 MOs in their HRD records, and seven MO allocated in the wards of interest resulting in seven MOs in the stratified sample. There were 292 nurses in the hospital and 5 nurses were working in the seven wards of interest during data collection which amounts to 35 nurses on the stratified sample. Records showed that there were four physiotherapists, one occupational therapist, one speech therapist, one audiologist, one clinical psychologist and three social workers working at the hospital.

According to the HRD records at H3 hospital, there were 16 MOs, and each of the seven wards of interest had one MO, thus a stratified sample size of seven MOs was represented in this facility. HRD records presented a total of 487 nursing staff and each of the seven wards of interest had six nurses, and that resulted in the stratified sample of 42 nurses. At this hospital, records showed three physiotherapists, two occupational therapists, three speech therapists, one audiologist, no clinical psychologist, and three social workers.

H4 hospital's HRD records indicated that there were 18 MOs, with each of the seven wards represented by one MO, so that a stratified sample of seven MOs was reached. The number of nurses employed in this hospital was 364 and each of the seven specified wards- had four nurses, which made up a stratified sample size of 28 nurses. This facility's records showed that there were four physiotherapists, two occupational therapists, one speech therapist, no audiologist, one clinical psychologist, and four social workers.

At H5 hospital, their HRD records showed that there were 36 MOs, with each of the seven specified wards serviced by two Mos; as a result, there were 14 MOs on the stratified sample. The same hospital had 812 nursing staff and each of the seven specified wards were serviced by six nursing staff, therefore making a stratified sample size of 42 nurses. There were 12 physiotherapists, six occupational therapists, four speech therapists, two audiologists, four clinical psychologists and eight social workers.

Hospital H6 had 38 MOs in their HRD records, of which three MOs worked in each of the seven wards of interest, making a stratified sample of 21 MOs. Of the 510-nursing staff recorded in their HRD, six nurses worked in each of the seven wards that were specified; as a result 42 nurses represented a stratified sample during the day of data collection. Records in this facility reported that 12 physiotherapists were employed, eight occupational therapists, four speech therapists, three audiologists, four clinical psychologists, and eight social workers.

H7 hospital reported 32 MOs in their HRD records; three MOs serviced each of the seven wards of interest, and a stratified sample of 21 MOs was possible. H7 hospital's Human Resources Department reported 416 nursing staff working in the hospital but each of the seven wards of interest were serviced by seven nurses and a stratified sample size of 49 nurses was projected. There were nine physiotherapists, 12 occupational therapists, six speech therapists, two audiologists, three clinical psychologists, and ten social workers.

Hospital H8 indicated 22 MOs in their HRD records; one MO serviced one of the seven wards of interest, and a stratified sample of seven MOs was estimated. H8 hospital’s records showed 268 nurses, and four nurses worked in each of the seven wards of specific interest; as a result a stratified sample of 28 nurses was approachable. This facility presented 14 physiotherapists, eight occupational therapists, four speech therapists, four audiologists, four clinical psychologists and eight social workers as employed by the facility.

A similar approach in the five private rehabilitation hospitals was followed with the presumption that each of the seven RMTs (a nurse, a medical officer, a physiotherapist, an occupational therapist, a speech/audio therapist, a clinical psychologist, a social worker) were present as explained by Table 3.2. below. H9 hospital’s records showed that there were three MOs, 14 nurses, eight physiotherapists, six occupational therapists, three speech therapists, no audiologists, two clinical psychologists, and two social workers.

H10 reported two MOs, 18 nurses, four physiotherapists, two occupational therapists, one speech therapist, no audiologist, one clinical psychologist and two social workers.

H11 showed in their records that there was one MO, eight nurses, two physiotherapists, one occupational therapist, no audiologist, one clinical psychologist, and one social worker.

H12 records had two MOs, 16 Nurses, four physiotherapists, three occupational therapists, two speech therapists, no audiologist, one clinical psychologist and one social worker.

There was one MO, 12 nurses, six physiotherapists, four occupational therapists, two speech therapists, no audiologists, one clinical psychologist, and two social workers at H13. Private rehabilitation hospitals had a population size of 140 that was eligible for sampling.

Table 3.2.Population size and sample size of private Rehab healthcare hospitals.

Private Rehab Hospital	100% sampling for possible research sample size From Employment population registry								Total
	MOs	Nurses	PT	OT	SLT	AUD	PSY	SW	
H9	03	14	08	06	03	00	02	02	38
H10	02	18	04	02	01	00	01	02	30
H11	01	08	02	01	01	00	01	01	15
H12	02	16	04	03	02	00	01	01	29
H13	01	12	06	04	02	00	01	02	28
Totals	09	68	24	15	09	00	06	08	140

In a population of approximately 4125 RMTs, the sample frame (information obtained from HRD-PERSAL system and employer registers) employed in the 13 targeted facilities resulted in a sample size of 748 (608 public healthcare participants, plus 140 private healthcare participants). Using a sample size calculator, a sample size of 352 participants was required to represent the 4125 population of RMTs with a confidence level of 95% and an error margin of +/- 5% points (Creative Research Systems, 2012)

It was considered that most institutions had more than one individual fulfilling similar roles/professions (e.g., three medical officers in a medical ward or two physiotherapists in the same hospital) which ensured that the targeted sample size was reached despite the possibility that some prospective participants chose not to take part in this study, or they were not present at work during the day of data collection. Studies by Marinah (2013), Zhen et al. (2006), and Neupane and Thepa (2001) had sample population sizes which amounted to totals of 100, 223, and 270 participants, respectively. This suggests that the research sample size of 352, of this research, was within the accepted ranges.

Strydom and Venter (2002) recommended that to perform basic statistical analysis, a sample size of 30 to 100 respondents was adequate. Not all the targeted prospective participants responded to the questionnaire, but more than 30 respondents were required to perform baseline statistical analysis (Strydom & Venter, 2002). With that said, the issues of reliability and validity were critical to providing legitimacy and acceptance of results (Bryman, 2016). As recommended by Salkind (2017) and Bryman (2016), the quality of questions asked, and a reasonable sample size that adequately addressed the research questions amongst the population of MRTs provided accurate estimates and associations with the variables assessed.

Instruments of Data Collection (Appendix A)

The research utilised a survey data collecting instrument, using questionnaires to collect empirical data information from the respondents (Creswell & Creswell, 2018; Bryman, 2016). The development of the questionnaire instrument was determined by the research questions, and some survey questions were informed by the literature reviewed from previous similar studies (Neuman, 2014). All questions in the survey were closed-ended questions.

Following Bryman (2016), the process of collecting empirical data for this research was conducted through the use of surveys, which contained variables that assessed the relationship between the monitoring and evaluation capacity, the awareness and use of rehabilitation outcome data measuring instruments by RMTs, at three diverse public and private rehabilitation healthcare research settings across KZN and GP provinces. According to Neuman (2014, p. 20) “(a) survey researcher asks people questions in a written questionnaire (mailed or handed to people) or during an interview and then records answers. The researcher manipulates no situation or condition; he or she simply asks many people numerous questions in a brief time period.”

3.4.1. Research Data Collecting Questionnaire (Appendix A)

Categories of measurement scales were used to quantify variables. Gender, age, and location of RMTs depicted categorical data in the form of nominal and ordinal data as the order of relativity (Salkind, 2017). Other variables were expressed in numerical order of discrete numbers of scores and continuous nature of the extent to which rehabilitation teams were aware of outcome measures (OMs), use OMs, or were capacitated to collect data.

3.4.2. Research Questionnaire Piloting

Bryman (2016) stresses the importance of piloting and pre-testing structured self-administered questionnaires; and that this provides feedback if the questions produce intended research objectives; additionally, that pre-testing the data collecting instrument provides an opportunity to confirm that the research questionnaire instrument as a whole function appropriately. Eight respondents in each of the three piloted hospitals (24 respondents in total) were issued with the self-administered questionnaire. The purpose of this pilot exercise was to determine the user-friendliness of the instrument, and to evaluate whether the instrument talked to the needs set by research objectives.

Furthermore, participants were afforded the opportunity to comment on the clarity of the asked questions and give their opinions on how the instrument could be improved. A discussion to seek more advice, was also held with an expert in the field of disability and rehabilitation. Before the actual data was collected on the sampled respondents, all relevant recommendations were considered.

3.5. Establishing Key Research Attributes and Variables in The Data Collecting Instrument

Attributes and variables examined in Section 3.5, contain indicators that the researcher has identified to pursue answers related to the research questions, or related associations. The answering of these questions by the research respondents accomplishes the research purpose by bringing the researcher closer to solving the research problem. The data collecting instrument was self-developed, and diverse sources of information from the literature was reviewed, including a review of past and present papers, and grey literature, all of which contributed to developing the instrument. A quantitative data collecting strategy with attributes and variables set for normal, ordinal, and discrete data was achievable. A combination of 5-point, 3-point Likert scales and YES or NO variables provided the bases for the data collecting instrument.

3.5.1. Demographic Questionnaire

Demographic characteristics of the participants play a critical role in identifying gender, age, level of education, working experience, and residential locality. These variables provide categorical data defining elements of rehabilitation multidisciplinary population groups. The demographic background covers the RMTs who were the participants of interest in this research. Previous studies such as Inglis and others (2008), Richards and others (2019), and DOH (2015) FSDRS specifically mention the RMTs regarding the use of rehabilitation outcome measures.

3.5.2. Resources for Rehabilitation Outcome Data Collecting Measuring Instrument Attribute

This attribute is closely linked to the monitoring and evaluation data governance, which questions whether the rehabilitation facility has provided resources used to collect data as an input that should be there in the first place for usage by therapists. Therefore naming, the nominal data, and the instrument or data collecting tool serves as a critical variable in this case (Kusek & Rist, 2004).

According to Kusek and Rist (2004), there are eight important questions to ask when assessing institutional readiness to conduct monitoring and evaluation, and one of them is asking about the potential pressure that encourages the RMT to collect data. The researcher of this study has identified this question as a relevant variable to collect. YES or NO ordinal data were therefore collected for this variable.

3.5.3. Data Collection and Information Usage

The focus of this attribute attempts to find out the type of rehabilitation information evidence the institution is using to make decisions and why that type of data is collected. This attribute elicits opinions about barriers affecting the usage of rehabilitation outcome measuring instruments. Both the 5-point Likert scale and YES or NO variables were used to collect ordinal and discrete data.

3.5.4. Skills Capacity Required to Monitor and Evaluate Rehabilitation Outcomes Data Collection

This feature aligns itself with human resource capacity development, and the financial resources provided to supply the appropriately skilled workforce. Gorgens and Kusek (2010) in their 2nd component of the "*12 Components of Making Monitoring and Evaluation System Works*" advocate for individual capacities, which are critical skills required to effectively collect, collate, analyse, and use rehabilitation information. Workforce capacity assists in achieving planned targets and improving reporting. Data is collected using a 5-point Likert scale and YES or NO variables. The sub-question focusing on assessing monitoring and evaluation capacity will provide attention to this attribute.

3.5.5. Accessibility, Availability, And Promotion of Data Use in The Organisation

Evaluating how data is presented in the organisation using case studies, and mapping how data is tracked from the source to the final product user, and presented to a multitude of stakeholders, enhances performance, ownership, and accountability (Measure Evaluation, 2017). Measure Evaluation (2017) in their manual "*Tools for Data Demand and Use*", in the health sector has advised that data governance policies, procedures, and guidelines strengthen the organisational culture and offer a clear indication of how rehabilitation data is formally reviewed in meetings and other platforms such as conferences.

Data advocacy should include collaboration between public-private partnerships so that learning is transferred across diverse environments and cultural settings. Rogers and Quinlan (2014) posit that the use of empirical evaluation data and enhanced information dissemination strategies provide convincing ideas to persuade decision-makers to buy in.

3.5.6. Clinical Awareness or Knowledge and Use of Rehabilitation Outcome Measuring Instruments

The rehabilitation outcome measuring instruments are traceable from the ICF framework (WHO, 2001), and they are used in a fundamental process that completes measuring disability and rehabilitation. These selected instruments validate the interest of this research in all aspects, including data validity and reliability, rehabilitation multidisciplinary participants, geographical location, and diverse public-private settings. The research participants are presented with these frequently used rehabilitation outcomes measuring instruments and they must choose the one they are familiar with. Finally, participants are required to indicate how and where they learnt/knew about the instrument (Inglis et al., 2008).

3.6. Research Procedures

3.6.1. Ethical Clearance and Permissions to Conduct the Study

Before initiating any contact with prospective participants, the relative ethical approval and clearance was sought from the respective stakeholders: the Wits School of Governance (WSG) research ethical committee (**Appendix E**); the Wits Medical Ethics committee (**Appendix F**), issued the final clearance. The study was registered with the National Health Research Database (NRHD), (**Annexure G**). The principal researcher wrote to the research health facilities requesting permission to conduct a research study **(Appendix C).** Furthermore, letters of support from the approached research sites were critical to gain access to those facilities **(Appendix H removed to adhere to non-discloser).**

3.6.2. Ethical Principles Consideration

The study adopted all means to ascertain that the code of conduct for both the university and the hospitals was maintained in this study. The researcher adhered to the principles of beneficence and non-maleficence by not exposing the respondents to any mistreatment (McNabb, 2017). The respondents' names were not required to be recorded in the questionnaire to maintain anonymity. Questionnaires were hand-collected, so there was no need to fill in contact personal information such as cellphone numbers, emails, or home addresses, which was in line with observing the Protection of Personal Information Act (POPIA) of 2013 (Staunton et al., 2020). In the publication of the final research report, no personal details of respondents and no names of the institutions were published or mentioned.

Bryman (2016) had mentioned issues of dealing with social research that arises when there was a lack of informed consent, invasion of privacy, and deception of participants. Observing ethical conduct, the researcher developed a research protocol that was submitted to the Wits Ethics Committees for review to ensure that the participants' rights were respected. The research involved interaction with human participants working in medical settings, therefore the Wits Human Research Ethics Committee (Medical) approved the study.

Before questionnaires were distributed, research information letters were issued, and the study purpose was explained to the RMTs **(Appendix D)**. All rehabilitation therapists who participated, by filling in the questionnaire, meant they consented to participating in the study, and therefore, there was no need for a consent form. The intentions of the proposed study were revealed from the onset, that data collected only served the purpose of pursuing the study as part of academic fulfillment. Participation was voluntary; respondents were allowed to withdraw from the study at any time if they wished to.

3.6.3. Recruitment of the Participants

The Hospitals that were selected in the two provinces, were visited upon an agreed meeting day. RMTs' numbers were screened (determined) per hospital, using the Personal Salary System (PERSAL) provided by Human Resource Department (HRD) in public hospitals, for the purposes of identifying participants, balancing the sample numbers and for making the decision whether or not they qualified to take part in the study. The process included asking how many nurses, doctors or therapists were working in the relevant unit. The same process was conducted in private hospitals. There was a process of verifying numbers to follow the stratified sampling principle to prevent bias on selecting the participants, especially in larger institutions where there was a large number of employees. Qualifying candidates were approached and asked to take part, and they were told that by filling in the questionnaire, they were giving their consent to participate in the study as indicated in the ethical approval mentioned in Sections 3.5.1 and 3.5.2.

3.7. Data Collection

Face-to-face primary data collection was conducted in the proposed research sites, and all the necessary screening, sanitising, social distancing, and use of Personal Protective Equipment (PPE) were prepared. The advantage of using the face-to-face, hand-delivered, site-filled, and collected questionnaire was the guaranteed high response turnover that ensured that the aimed for sample size was obtained. This is the especially the case when the targeted population size is small, not widespread and the cost of collecting data is manageable (Gray, 2019). The respondents completed the questionnaire without the researcher being present. The researcher excused himself after explaining the aim of the study, answering any questions the participants might have had, and by the participants filling in the questionnaire, they gave their consent to participate. The researcher returned after a specified period (e.g., 20 min) to collect the completed surveys **(Appendix B)**.

Quantification of collected and analysed data using statistical methods which were descriptive and made general relative associations with the variables, were important analytical elements of this research report (Salkind, 2017). Statistical data emanated from relating associations linked to whether the rehabilitation therapists at the three diverse public and private rehabilitation healthcare research settings monitor and evaluate the use of rehabilitation outcome measures data collecting instruments to determine the success of rehabilitation programs and available capacities (Bryman, 2016).

3.8. Data Analysis

3.8.1. Organisation of Data

Upon completion of the data collection process, the researcher was responsible for the safe storage of data in a secured locked filing cabinet for hard copy data, and password protected files for soft copy data. The returned hand-collected questionnaire data set was processed by capturing the data in Microsoft Excel to create a database. During this process, information, nominal, ordinal, interval, or ratio entered was checked for consistency and validity. Captured data was coded systematically to arrange it into different categories, and assigned with variables that were coded in a meaningful, organised manner (Neuman, 2014; Bryman, 2016; Gray, 2019). The Statistical Package for the Social Sciences (SPSS) latest version e.g., V27 was used as a statistical tool to convert the different forms of data to numerical scores.

3.8.2. Analysis of Results

In preparing the data for analysis, a coding structure was developed using Microsoft Excel Spreadsheet software (Neuman, 2014; Bryman, 2016). Data was processed and arranged in a coded structure and subjected to a statistical data analysis process using descriptive and inferential statistics (Salkind, 2017). Descriptive statistics summarised the collected data into numerical meanings depicting averages and variations to compare and match responses (Salkind, 2017). Inferential statistics of non-parametric statistic groups were included, using the Chi-square-Test to test the main research questions. This assisted to prove whether the frequencies observed were generally associated to the independent research variables. The Chi-square non-parametric statistical test is the test that allows the analysis of data which comes in frequencies, at nominal and categorical variable level of measure (Salkind, 2017). There are two types of Chi-square tests, the first, the Chi-square Goodness-of-Fit which test how the observed/collected data perfectly fit to the existing data scores (Salkind, 2016) and the second Chi-square is the Test-of-Independence also known as Test-of-Association which allows the examination of two-dimensional variables which are independent of each other (Salkind, 2016). This research has chosen to use the Chi-square Test of Independence. The reasons the researcher chose this test are the following:

Question one (1) and Question two (2) of the research used the Chi-square of independence to observe the association between two variables of Province (KZN and GP) and Awareness and Use of ROMs (Yes and No). Furthermore, Question one (1) and Question two (2) used the Chi-square of independence to sort associations between Work Setting Identity (public rural setting, public urban setting and private urban setting) and Awareness and Use of ROMs (Yes and No). Question three (3) of the research used Chi-square of independence to determine the association between Provision of ROMs (Yes or No) and Research Setting Identity (public rural setting, public urban setting and private urban setting). Question three (3) further determined the

Provision of training financial resources (Yes or No) and the Research Setting Identity (public rural setting, public urban setting, and private urban setting). The other determinant for choosing Chi-square of independence was type of data which was at the level of nominal and categorical measures. The Chi-square of independence assisted the researcher to compute the Chi-square test statistic obtained value (Salkind, 2016).

The use of Chi-square of independence statistical test in measuring the association between research variable brought about the fact that the researcher cannot be 100% sure that the observed results are perfect. There could be other factors at play that may interfere with the tested variables, so there was a need to mention how much of the risk the researcher was willing to take and state that it was systemic influence or by chance (Salkind, 2017). Therefore, this brought about the concept of statistical significance level. Significance level is the possibility arising from not being undisputed or unequivocal that the observed results are 100% correct. The level of chance the researcher was willing to accept is referred to as statistical significance and in this research was placed at level (5%) or $p<0.05$ (Salkind, 2017). What the level of significance does it allows the researcher to make a judgement of whether to accept or reject the null hypothesis as the bases of determinant (Salkind, 2017). If the results fall within the level (5%) or p value is < 0.05 then this means the researcher was able to minimize risks and therefore, the null hypothesis is rejected in favor of the research hypothesis acceptance.

Hypothesis is an informed speculation (Bryman, 2016) a prediction (Wotela, 2017c) or an educated guess (Salkind, 2017) which is set up to test an outcome regarding the relationship between the two or more variables. Furthermore, the hypothesis has a direct relationship to the research variables and the research purpose, questions, and objectives (Salkind, 2017). In opposition the null hypothesis carries no relationship to the research variables. In addition, the null hypothesis set an outlet that establish a starting point to measure the outcome of the study and explanation of observed differences (Salkind, 2017). Chapter one (1) section 1.5 present the research questions and its related hypotheses that will be tested, presented in results chapter four (4) and discussed in chapter five (5).

Below is Table 3.3 detailing the data collection and the analysis of the variables associated with the research questions. It outlines the objectives of the data collection, the type of data collected, the tools used, and the type of statistical data analysis performed.

Table 3.3.Data collection tools and statistical analysis of the data types from the research objectives.

Table 3.3: Data Collection Tools and Statistical Analysis of the Data types from the research Objectives

OBJECTIVE	**TYPE OF DATA TO COLLECT**	**TOOL USED**	**TYPE OF STATISTICAL ANALYSIS**
Characteristics of population	Nominal scale	Demographic questionnaire	Descriptive and frequency analysis
Ascertain the provision of rehabilitation outcome measuring instruments by the institution. Determine motives for data collection at the organisational and personal level	Nominal scale	Self-developed questionnaire	Descriptive, percentages and non-parametric inferential statistics, Chi-Square
Assess data governance, quality, and appropriateness	Nominal, ordinal, and interval scale	Self-developed questionnaire	Descriptive, and frequency
Assess the monitoring and evaluation data collecting capacity	Nominal, categorical scale	Self-developed questionnaire	Descriptive, frequency and non-parametric inferential statistics Chi-Square
Evaluate rehabilitation data use, sharing, packaging, dissemination, and promotion	Nominal scale	Self-developed questionnaire	Descriptive and frequency analysis
Determine knowledge, use and source of education about rehabilitation outcomes measuring instruments	Nominal scale	Self-developed questionnaire	Descriptive analysis and non-parametric inferential statistics Chi-Square

3.9. Reliability and Validity

It was reasoned by Cresswell et al. (2016) that scientific and responsible references to elements such as reliability and validity demonstrate the responsible way in which research is conducted. This meant that any researcher applying the same methods that were adopted in this study should get the same results if conducted elsewhere.

3.9.1. Reliability

Reliability refers to the consistency or stability of a set of test scores found in data collected; if a test or assessment procedure provided reliable scores, the scores would be similar every time (Bryman, 2016). The replicability of the previous similar research studies' trends of data collected, and the pilot study conducted in this research were employed to assess if the research methodology and procedures were in line with current trends, thus ensuring the reliability of the study. Clearly detailing and defining the procedures and methods used to come to the results were replicable and yielded the same results when audited by other researchers or auditors.

3.9.2. Validity

Validity in this study was indicated by following the requirements needed in pursuing a scientific research method to achieve the findings generated through this research. This included ensuring that the correct measuring instruments applied to measure variables did measure what they were developed to measure (Bryman, 2016; Neuman, 2014). In a quantitative research study, the most common measures of validity are as follows: measurement validity; internal validity; external validity; and ecological validity (Bryman, 2016).

Measurement validity was ensured by reviewing the previously published studies with similar questionnaires, and self-developed questions being reviewed by academics and experts on this topic. To ensure validity of this study, previous research papers produced by the following authors: Inglis et al. (2008), in their article entitled "*The* *awareness and use of outcome measures by South African Physiotherapists"*; Demers and others (2018); Richards et al. (2019); Salter et al. (2013), in their Chapter 20 of a book contribution which wrote about "*Outcome Measures in Stroke Rehabilitation";* and Joseph and Rhoda (2011); informed measurement validity of this research and served as benchmark resources for instrument correctness.

Furthermore, a pilot study was done to improve the strength of measurement validity. The non-experimental nature of the cross-sectional design meant causal relationships could not be inferred, but relationships between variables could be drawn, therefore this research lacked internal validity (Bryman, 2016). The research fell short of external validity because of the study design, the sampling technique, and sample size, and thus the research findings could not be generalised. The nature of administering questionnaires in a controlled environment influenced the respondents to respond in a particular way, therefore rendering the study's ecological validity compromised (Bryman, 2016). The logical order of the steps followed from the inception of the research to completion was documented and the data was stored safely.

3.10. Limitations, Feasibility, and Positionality

Due to human error, there was a possibility that data entry errors might occur resulting in incorrect findings (Neuman, 2014). Only associations concerning the studied population of rehabilitation therapists around KZN and GP hospitals were made because of the research design, sampling technique, and sample size limitations. A randomised, larger sample from across the country would be required to generalise the results to the whole South African community of RMTs in public and private hospitals (Bryman, 2016).

The researcher chose to conduct face-to-face delivery and collection of questionnaires, which was time-consuming, and required traveling to different locations of selected hospitals located within the KZN and GP. The effort and cost of collecting data presented budget constraints, which required serious considerations.

Researching public and private hospitals require approval from the institutions themselves and ethical approval from the researcher's university. Registration with the

National Health Research Database (NHRD) for South African academic hospital research and public hospitals was the first step (Health Systems Trust, 2020). Private hospitals have established independent research review committees, which have the authority to permit or not to permit research in their facilities (Life Healthcare, 2020).

Both public and private hospitals required a copy of the research proposal, and approval by the researcher's university ethics committee before they would consider a proposal review meeting. This process of following protocols towards obtaining approval delayed the entire process of commencing with the actual empirical data collection.

The hospitals' research committees that approved partaking in the study issued formal written permission letters, addressed to the university and the researcher. The hospital manager was the point of entry to gain access to the research site. Introductions and the objectives of the study, permission, and arrangements to interact with research participants in different departments had to be discussed.

Regarding the researcher’s positionality, the researcher is an experienced physiotherapist with a passion for disability and rehabilitation public policy development. For some reason, rehabilitation had not been made a priority within government health outcomes, which led to data starvation regarding rehabilitation data progress (DOH, 2015). This strongly motivated the researcher to start the discourse towards the adoption of rehabilitation outcomes measures data collecting instruments, which could generate much-needed data to assist in aligning decision-making by policymakers.

The researcher is originally from the rural areas of northern KZN where he began his career and where one of the research sites was located. The researcher has first-hand experience of working in these rural areas’ conditions, this motivated the researcher to include KZN in the study. Therefore, it was seen to be important that this research included facilities in rural areas, because, according to the NHI (2019) policy, it aims to reach full implementation by 2026, and so rural areas should also be ready to demonstrate and provide evidence that shows that inpatient rehabilitation facilities and services are a necessity. Furthermore, the researcher has also worked in the private rehabilitation healthcare facilities in Gauteng and developed the passion to use ROMs in this environment, with this said private rehabilitation facilities provided an opportunity to compare the two healthcare settings and the opportunity to benchmark, learn and forge good governance partnerships.

3.11. Dissemination of Research Results

The findings of the study were disseminated to all research sites in both provinces of KZN and GP. The final thesis was sent to participating hospitals via email, with the findings discussion document (especially for participants). On request and dependent on the researcher's availability, research findings presentations were considered.

Furthermore, findings were shared with the National Department of Health, the Department of Women, Youth, and Persons with Disabilities and other critical stakeholders such as disability and rehabilitation policymakers. The researcher plans to seek further opportunities to present the study findings on relevant platforms such as disability and rehabilitation health conferences. Lastly, the focus of this research consisted largely of interrogating health systems data management, therefore it would be of great benefit to be able to share the research findings with the monitoring and evaluation community.

CHAPTER 4: RESULTS

4.1 Introduction

The primary purpose of this research, as stated in Chapter 1, was to evaluate the use of rehabilitation outcome measuring instruments. The study involved different healthcare settings across public hospitals and private rehabilitation facilities in the provinces of KZN, and GP. This provided a space to assess the available monitoring and evaluation capacity, the opportunities for learning, and the existing challenges across these diverse healthcare settings, focusing on the RMTs.

The researcher found that so far, no literature available had investigated the use of rehabilitation outcome data measuring instruments across provinces, in healthcare facilities, and by RMTs in South Africa. Therefore, this chapter presents results by first looking at the background demographic characteristics of the participants (Section 4.2.); secondly presenting the objectives of the research using frequencies (Section 4.3.); using non-parametric statistics to address the research questions' findings (Section 4.4.); and presents a summary (Section 4.5.).

360 questionnaires were hand-delivered to the respondents and 258 questionnaires were brought back, therefore, a response rate of 72% was achieved. Out of the 258 responses, five questionnaires were not valid as two respondents were administrators, another two were OT assistants not meeting the research sampling criteria, and one respondent did not complete more than half of the questionnaire instrument. Only 253 were valid, and as a result, a valid response rate of 98% was achieved.

253 RMT members participated in the research study, which represented 72% of the estimated sample. The sample size of 352 respondents was required, but only 253 participants responded, resulting in a short fall of 99 (28%) respondents.

4.2. Research Objectives and Results

4.2.1. Research Objective 1: Demographic Characteristics of the Study Subjects (n, 253)

4.2.1.1. Gender (Sex) and Age

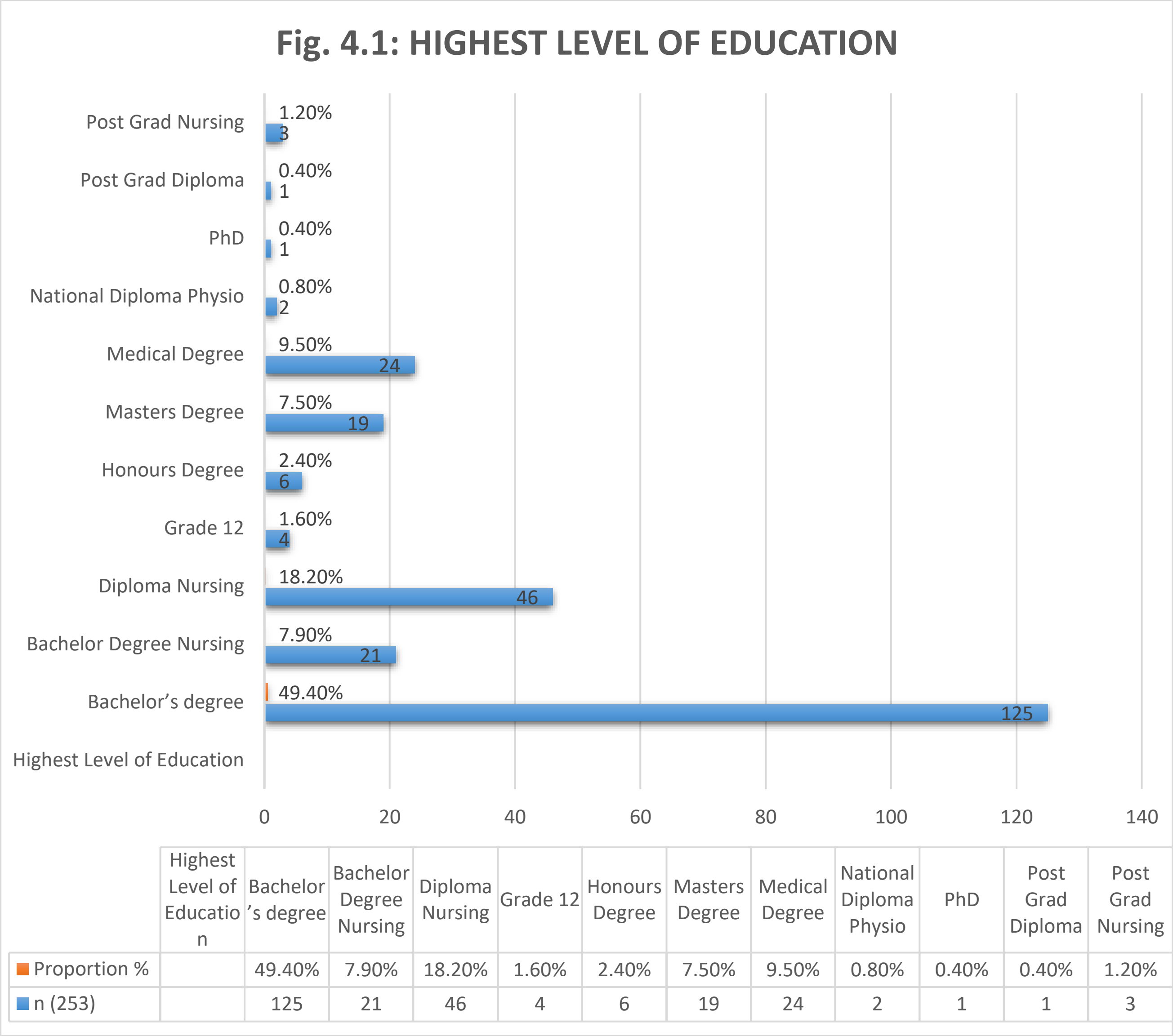
A total number of 253 participants were surveyed. Out of these, 23.3 % (n=59) were males and 76.7% (n=194) females, with ages ranging from 21 to 65 years old; the mean age was 35, representing a standard deviation of 10.6 years (Table 4.1).

Table 4.1.Gender and Age of the subjects

Table 4.1: Gender and Age of the Subjects		
Gender (Sex)	**n (253)**	**Proportion (%)**
Male	59	23.3%
Female	194	76.7%
Age (Mean / Sd)	**21-65 (35) Mean / (10.6)Sd**	

4.2.1.2. Level of Education

49% of participants in this study (n=125) had Bachelor degrees. 7.9% (n=21) of these were Bachelor Degrees in Nursing; 18.6% (n=46) possessed diplomas in nursing; 1.6% (n=4) were nursing students with Grade 12; there were 2.4% (n=6) honours degree participants; 7.5% (n=19) had masters degrees; 9.5% (n-24) had medical degrees; while 0.8% (n=2) had a National Diploma in Physiotherapy; , PhD had 0.4% (n=1) representation; Post Graduate Diploma had 0.4% (n=1); and 1.2% (n=3) possessed a Post graduate qualification in nursing (Figure 4.1).

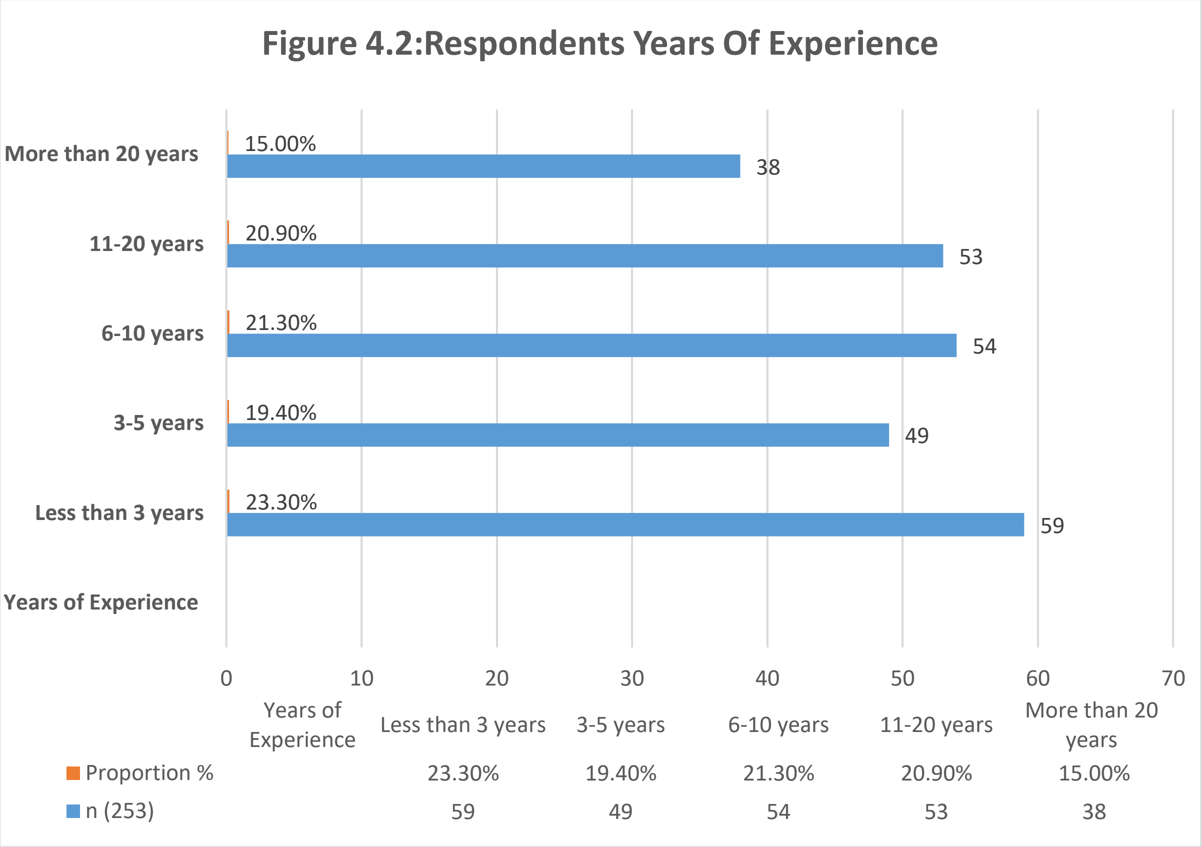


	Highest Level of Education	Bachelor’s degree	Bachelor Degree Nursing	Diploma Nursing	Grade 12	Honours Degree	Masters Degree	Medical Degree	National Diploma Physio	PhD	Post Grad Diploma	Post Grad Nursing
🟧 Proportion %		49.40%	7.90%	18.20%	1.60%	2.40%	7.50%	9.50%	0.80%	0.40%	0.40%	1.20%
🟦 n (253)		125	21	46	4	6	19	24	2	1	1	3

Figure 4.1:Highest Level of Education

4.2.1.3. Years of Experience

In the study, 23.3% (n=59) of participants had work experience of fewer than three years; 19.4% (n=49) had work experience of between 3 to 5 years; while 21.3% (n=54) had worked between 6 to 10 years; the participants with 11-20 years’ experience represented 20.9% (n=53); and 15.0% (n=38) had more than 20 years of experience (Figure 4.2).

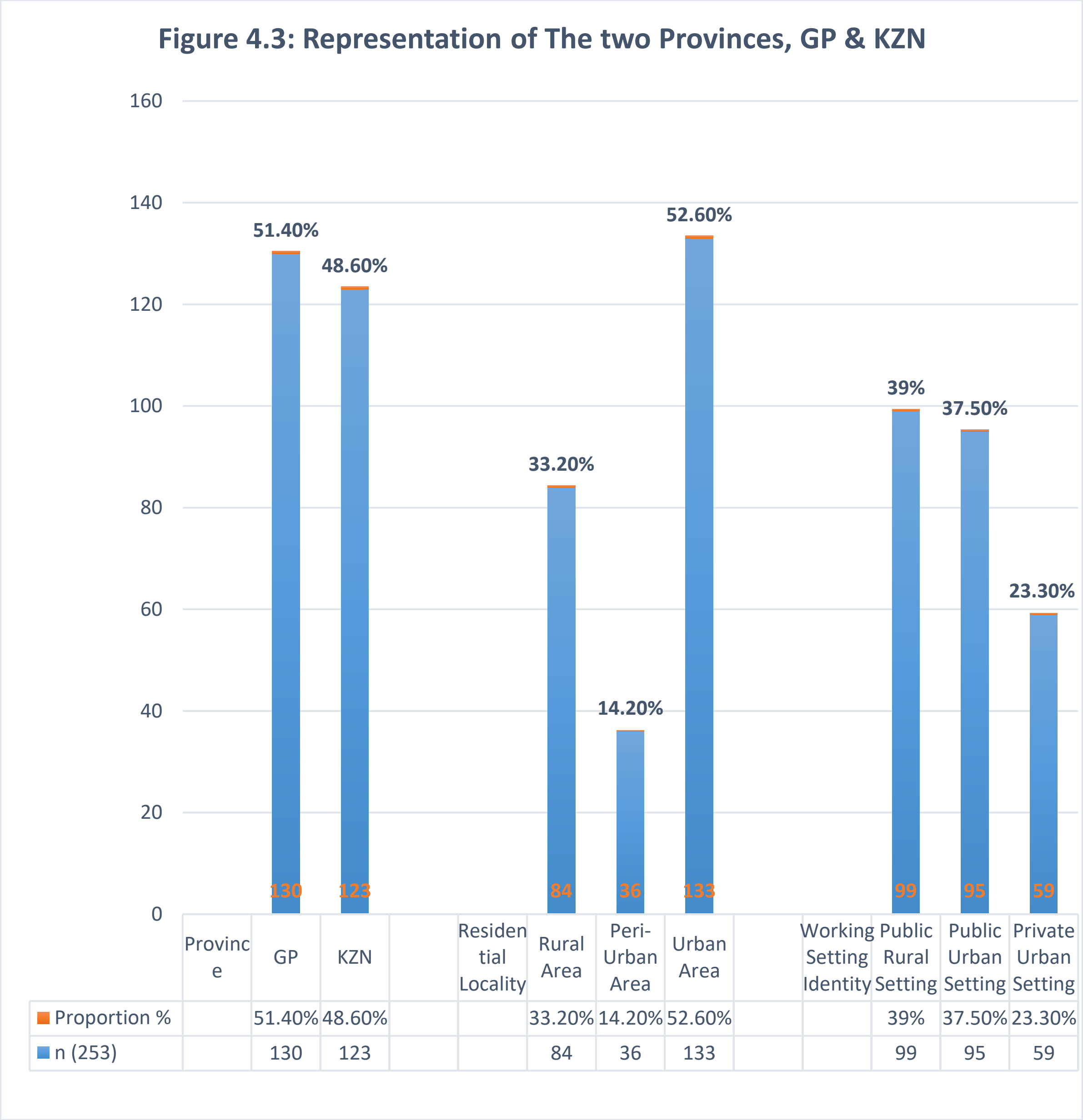


	Years of Experience	Less than 3 years	3-5 years	6-10 years	11-20 years	More than 20 years
🟧 Proportion %		23.30%	19.40%	21.30%	20.90%	15.00%
🟦 n (253)		59	49	54	53	38

Figure 4.2:Respondents' Years of Experience

4.2.1.4. Province, Residential Locality, and Working Setting Identity

GP province was represented by 51.4% (n=130) respondents; while KZN had 48.6% (n=123). Rural areas had 33.2% (n=84) representation; whilst peri-urban areas had 14.2% (n=36); and urban areas had 52.6% (n=133). 39% (n=99) were from public rural settings; while public urban settings had 37% (n=95) representation; and lastly, private urban settings were represented by 23.3% (n=59) of participants (Figure 4.3).



	Province	GP	KZN		Residential Locality	Rural Area	Peri-Urban Area	Urban Area		Working Setting Identity	Public Rural Setting	Public Urban Setting	Private Urban Setting
🟧 Proportion %		51.40%	48.60%			33.20%	14.20%	52.60%			39%	37.50%	23.30%
🟦 n (253)		130	123			84	36	133			99	95	59

Figure 4. 3:Representation of the two Provinces, GP & KZN

4.2.1.5. Profession Demographics

Audiologists were represented by 3.6% (n=9) participants; clinical psychologists had 4.7% (n=12) representation; while 9.9% (n=25) were medical doctors; nurses represented 28.9% (n=73); while occupational therapists represented 15.0% (n=38); physiotherapists comprised 22.1% (n=56); social workers comprised 8.7% (n=22); while speech therapists represented 6.7% (n=17); and there was 0.4% (n=1) representation of spinal/orthopaedic surgeon specialist (Figure 4.4).

	Audiologist	Clinical Psychologist	Medical Doctor	Nurse	Occ Therapy	Physiotherapist	Social Worker	Speech Therapist	Spinal/Ortho Surgion Specialist
■ No / Proffession	9	12	25	73	38	56	22	17	1
■ % per Proffession	3.6%	4.7%	9.9%	28.9%	15.0%	22.1%	8.7%	6.7%	0.4%

Figure 4.4:Profession Representation

4.2.2. Research Objective 2: Ascertain the Provision of Rehabilitation Outcome Measuring Instruments by the Institution

The respondents were asked to indicate whether the institution they were working for had provided them or categorically stated the rehabilitation measure to use. Table 4.2. showed that 39.5% (n=100) responded YES, while 60.5% (n=153) said NO. It was further requested of the participants who said YES that the institution they work for provided the rehabilitation outcome measuring instruments, should name them. The most common mentioned by the group of respondents was FIM/FAM appeared (mode=31); BETA was mentioned (mode=8); ASIA Scale appeared (mode=7); while

BBS was mentioned (mode=6); BI appeared (mode=6); MOCA was named (mode=6); while SCIM was mentioned (mode=5); Hospital Data Collection was called (mode=5); Progress notes/SOAP notes appeared (mode=5); MAS was mentioned (mode=2); while a Goniometer was called named (mode=2); Finally, Oxford Scale(n=1), Ashworth Scale(n=1), VAS (n=1), and COMMODE (n=1). were mentioned once in their respective order .

Table 4.2.Provision or indication of rehabilitation outcome measuring instrument to use.

Table 4.2: Provision or Indication of Rehabilitation Outcome Measuring Instrument to Use			
	Frequency (n, 253)	Percentage (100%)	TOTAL (253)
Yes	100	39.5%	100
No	153	60.5%	153
Provide the name of the rehabilitation measure that is provided if YES, if NO, provide what you use as a health practitioner			
Yes/Provision	FIM/FAM (31), BETA (8), ASIA Scale (7), BBS (6), BI(6), MOCA(6), SCIM(5), Hospital Data Collection (5), Progress notes/SOAP notes(5), MAS(2), Goniometer(2), Oxford Scale(1)Ashworth Scale(!),VAS(1), COMMODE(1)		
No/Provision	SOAP notes (12), Clinical File (4), Oxford Scale(4), Monthly Statistics(3), VAS(3), BBS(3), BI(2), FIM/FAM(2), ASIA(1), MAS(1), Goniometer(1), Statoscope(1), Dynameter(1), 6 min WT(1), EPDMS(1)		
Potential pressure to evaluate rehabilitation outcome measures			
Yes	148	58.5	148
No	105	41.5	105
South Africa (both public & private healthcare) needs standardization of rehabilitation data collecting instruments.			
Strongly Agree	130	51.4%	130
Agree	78	30.8%	78
Neutral	26	10.3%	26
Disagree	7	2.8%	7
Strongly disagree	12	4.7%	12

When respondents who said NO, asked to indicate what did they use to record their rehabilitation outcomes, SOAP notes appeared (mode=12); while Clinical File was called (mode=4); Oxford Scale was mentioned (mode=4); Monthly Statistics was mentioned (n=3); VAS appeared (mode=3); BBS was mentioned (mode=3); BI was identified (n=2); while FIM/FAM appeared (n=2); and ASIA (n=1);, MAS (n=1), Goniometer (n=1), Statoscope (n=1, Dynameter (n=1), 6 min WT(n=1), and EPDMS (n=1) were mentioned once in their respective order.

Participants had to give an opinion on whether there was potential pressure that encouraged them to monitor and evaluate rehabilitation outcomes data. 58.5% (n=148) said YES while 41.5% (n=105) said NO. Respondents were given a statement that said South Africa both in public and private sectors needed standardisation of rehabilitation outcome measuring data collecting instruments: 51.4% (n=130) strongly agreed; 30.8% (n=78) agreed; while 10.3% (n=26) were neutral; 2.8% (n=7) disagreed with the statement; and 4.7% (n=12) strongly disagreed.

4.2.3. Research Objective 3: Assess Data Governance, Quality, And Appropriateness

In this sub-section, participants were asked to rate their agreement or disagreement with a statement that said: your employer has identified rehabilitation outcomes data information for decision-making. When the participants gave their responses, 20.6% (n=52) strongly agreed; 32.0% (n=81) agreed; while 29.2% (n=74) were neutral; 11.5% (n=29) disagreed; and 6.7% (n=17) strongly disagreed. The opinion of the participants was sourced to test whether the institution collected streamlined data: 52.6% (n=133) said YES; and 47.4% (n=120) answered NO.

Reasons for rehabilitation data collection by the institution were asked of the participants through three statements: 26.5% (n=67) of the participants selected "Effective clinical practice"; while 17.4% (n=44) said it was for "Evidence-based practice and decision-making"; and 55.7% (n=141) said it was for "Effective clinical practice, evidence, and decision-making".

A 5-point Likert scale was used to find out if rehabilitation outcomes data was collected routinely with health information performance in the institution: 13.4% (n=34) strongly agreed; 24.5% (n-62) agreed; 28.1% (n=71) were neutral; while 11.9% (n=30) disagreed; and 22.1% (n=56) respondents strongly disagreed. See Table 4.3.

Table 4.3.Identification of rehabilitation outcomes data information for decision-making.

Table 4.3: Identification of Rehabilitation Outcomes Data Information for Decision-Making			
	Frequency (n, 253)	Percentage (100%)	TOTAL (253)
Strongly Agree	52	20.6%	52
Agree	81	32.0%	81
Neutral	74	29.2%	74
Disagree	29	11.5%	29
Strongly disagree	17	6.7%	17
Streamlined rehabilitation data collection at your institution			
Yes	133	52.6%	133
No	120	47.4%	120
Reasons for rehabilitation data collection at your institution			
Effective clinical practice	67	26.5%	67
Evidence-based practice and decision-making	44	17.4%	44
Effective clinical practice, evidence, and decision-making	141	55.7%	141
Assessment of rehabilitation outcomes data with routine health information performance			
Strongly Agree	34	13.4%	34
Agree	62	24.5%	62
Neutral	71	28.1%	71
Disagree	30	11.9%	30
Strongly disagree	56	22.1%	56
Data collection and storage system availability			
Yes	180	71.1%	180
No	73	28.9%	73
Need for tools assessing barriers to data use			
Yes	176	69.6%	176
No	77	30.4%	77

On the data collection and storage availability: 71.1% (n=180) said YES, the storage system was available; while 28.9% (n=73) said NO it was not available. Participants were asked if there was a need for a tool that assesses barriers to data use: 69.6% (n=176) said YES; and 30.4% (n=77) said NO. (Table 4.3.).

4.2.4. Research Objective 4: Assess the Monitoring and Evaluation of Data Collecting Capacity

In this section, firstly, the participants were asked to provide their view about the need for capacity to collect, analyse, and use data, and they responded on the 5-point Likert scale in the following manner: 26.5% (n=67) strongly agreed; 46.2% (n=117) agreed; while 16.6% (n=42) were neutral; 6.3% (n=16) disagreed; and 4.3% (n=11) strongly disagreed.

Secondly, respondents had to respond to the question that asked whether the institution provided financial resources to support capacity development for rehabilitation outcomes data collecting instruments: 26.5% (n=67) said YES; and 73.5% (n=186) said NO.

Those who said YES were asked to provide the name of the rehabilitation outcomes that they were capacitated to use: and FIM (mode=30) appeared most in the list; followed by MOCA (mode=5); ASIA (mode=3) was mentioned and SCIM, OBRL, COMMODE, HOIST, Basic Wheelchair Sitting Course, all appeared once.

Thirdly, participants were asked whether M&E champions were available in their facilities: 26.9% (n=68) said YES; and 73.1% (n=185) said NO. Fourthly, participants were asked whether the facility they were working for had developed leadership capacity for data demand and use: 28.5% (n=72) said YES; and 71.5% (n=181) said NO, the facility has not developed leadership capacity.

Fifthly, the 5-point Likert scale was used to ask if the respondents agreed or disagreed with the statement that said: Your facility needs M&E champions: 25.7% (n=65) strongly agreed; 36.4% (n=92) agreed; while 20.6% (n=52) of respondents were neutral; 10.3% (n=26) disagreed; and 7.1% (n=18) strongly disagreed.

Lastly, respondents were asked if there are challenges that prevent them from collecting rehabilitation data: 34.0% (n=86) said YES; and 66.0% (n=167) said NO. (Table 4.4.).

Table 4.4.Need for capacity to collect, analyse, and use data.

Table 4.4: Need for Capacity to Collect, Analyse, And Use Data			
	Frequency (n, 253)	**Percentage (100%)**	**TOTAL (253)**
Strongly Agree	67	26.5%	67
Agree	117	46.2%	117
Neutral	42	16.6%	42
Disagree	16	6.3%	16
Strongly disagree	11	4.3%	11
Financial resources to support capacity development for rehabilitation outcomes data instruments have been provided			
Yes	67	26.5%	67
No	186	73.5%	186
If yes, provide the name of the rehabilitation outcome that capacity was provided			
Yes	FIM (30), MOCA (5), ASIA (3), BETA (2), SCIM(1), OBRL(1), COMMODE(1), HOIST(1), Basic Wheelchair Sitting Course(1)		
Monitoring and Evaluation campions availability			
Yes	68	26.9%	68
No	185	73.1	185
Leadership capacity development for rehabilitation data demand and use			
Yes	72	28.5%	72
No	181	71.5%	181
Need for Monitoring and Evaluation champions			
Strongly Agree	65	25.7%	65
Agree	92	36.4%	92
Neutral	52	20.6%	52
Disagree	26	10.3%	26
Strongly disagree	18	7.1%	18
Challenges preventing rehabilitation outcomes data collection			
Yes	86	34.0%	86
No	167	66.0%	167

4.2.5. Research Objective 5: Evaluate Rehabilitation Data Use, Sharing, Packaging, Dissemination, And Promotion

Participants were asked if they had used case studies, and analytical tools to visualise gaps and developed interventions to improve healthcare: 21.3% (n=54) said YES; and 78.7% (n=199) said NO. They were further quizzed on whether they have used information mapping to strengthen feedback mechanisms: 28.5% (n=54) said YES, and 78.7% (n=164) said NO.

25.2% (n= 89) of participants said YES, they had used policies, procedures, and guidelines for rehabilitation outcomes data performance reviews and improvements; while 64.8% (n=164) said NO they had not. Respondents were asked if they had collaborated as private and public healthcare and other stakeholders to share knowledge by learning from each other: 27.3% (n=69) said YES, and 72.7% (n=184) NO. (Table 4.5).

Table 4.5.Use of case studies, and analytical tools, visualise gaps to improve healthcare programs

Table 4.5: Use of Case Studies, And Analytical Tools, Visualise Gaps to Improve Healthcare Programs			
	Frequency (n, 253)	**Percentage (100%)**	**TOTAL (253)**
Yes	54	21.3%	54
No	199	78.7%	199
Use of information mapping to strengthen feedback mechanisms			
Yes	72	28.5%	72
No	181	71.5%	181
Use of Policies, Procedures, and guidelines for rehabilitation outcomes data performance reviews, and improvement			
Yes	89	35.2%	89
No	164	64.8%	164
Collaboration between private, public, and other stakeholders to share lessons across provinces (building partnerships and sharing knowledge)			
Yes	69	27.3%	69
No	184	72.7%	184

4.2.6. Research Objective 6: Determine Knowledge, Use, And Source of Education About Rehabilitation Outcome Measuring Instruments

In the knowledge/awareness of rehabilitation outcome measures: the FIM outcome measure was 42.7% (n=108) who said YES, they knew/aware of this instrument; and 57.3% (n=145) said NO they did not. In the BI, 31.2% (n=79) said YES, they knew this instrument; but 68.8% (n=174) said NO they did not. The FAI had 6.7% (n=17) who responded YES, they were aware of this instrument; while 93.3% (n=236) said NO they did not. MARS was known by 21.7% (n=55) of participants who responded YES; and was not known by 78.3% (n=198) who responded NO. NEADL had 12.3% (n=31) participants that responded YES; and 87.7% (n=222) that said NO (Table 4.6.).

Table 4.6.Knoledge/Awareness of rehabilitation outcome measures.

Table 4.6: Knowledge/Awareness of Rehabilitation Outcome Measures			
Functional Independence Measure (FIM)			
Knowledge/Awareness	Frequency (n, 253)	Percentage (100%)	TOTAL (253)
Yes	108	42.7%	108
No	145	57.3%	145
Barthel Index (BI)			
Yes	79	31.2%	79
No	174	68.8%	174
Frenchay Activity Index (FAI)			
Yes	17	6.7%	17
No	236	93.3%	236
Modified Rankin Scale (MRS)			
Yes	55	21.7%	55
No	198	78.3%	198
Nottingham Extended Activity of Daily Living Scale (NEADL)			
Yes	31	12.3%	31
No	222	87.7%	222

In the use of rehabilitation outcome measures: the FIM outcome measure, 33.2% (n=84) said YES, they used this instrument; and 66.8% (n=169) said NO they did not. In the BI, 23.3% (n=59) said YES, they used this instrument; but 76.7% (n=194) said NO they did not.

The FAI had 4.0% (n=10) who responded YES, they used this instrument; while 96.0% (n=243) said NO they did not. MARS was used by 12.3% (n=31) of participants who responded YES; and was not used by 87.7% (n=222) who responded NO. NEADL had 5.5% (n=14) participants that responded YES; and 94.5% (n=239) that said NO. (Table 4.7).

Table 4.7.Use of rehabilitation outcome measures.

Table 4.7: Use of Rehabilitation Outcome Measures			
Functional Independence Measure (FIM)			
Use	**Frequency (n, 253)**	**Percentage (100%)**	**TOTAL (253)**
Yes	84	33.2%	84
No	169	66.8%	169
Barthel Index (BI)			
Yes	59	23.3%	59
No	194	76.7%	194
Frenchay Activity Index (FAI)			
Yes	10	4.0%	10
No	243	96.0%	243
Modified Rankin Scale (MRS)			
Yes	31	12.3%	31
No	222	87.7%	222
Nottingham Extended Activity of Daily Living Scale (NEADL)			
Yes	14	5.5%	14
No	239	94.5%	239

Journals were used by 8.3% (n=21) as a source of information; the internet came at 8.7% (n=22); and 18.6% (n=47) respondents said they benefited from training workshops. Varsity undergrad came at 23.3% (n=59) who responded to this type of resource; 0.8% said they used varsity postgrad as the source of information; peer learning constituted 18.6% (n=47) of respondents. Table 4.8.

Table 4.8.Source of rehabilitation outcome measures education

Table 4.8: Source of Rehabilitation Outcome Measures Education			
Journal Articles			
	Frequency (N 253)	Percentage (100%)	TOTAL (253)
Yes	21	8.3%	21
No	232	91.7%	232
Internet			
Yes	22	8.7%	22
No	231	91.3%	231
Training workshops			
Yes	47	18.6%	47
No	206	81.4%	206
Varsity undergrad curriculum			
Yes	59	23.3%	59
No	194	76.7%	194
Varsity postgrad curriculum			
Yes	2	0.8%	2
No	251	99.2%	251
Peer learning / from work colleagues			
Yes	47	18.6%	47
No	206	81.4%	206

4.3. Research Questions and Results

4.3.1. Research Question 1

Are the rural KZN, urban GP public Hospitals, and private rehabilitation hospitals in KZN and GP aware of rehabilitation outcome measuring instruments to use when recording the progress or regress of therapy?

Table 4.9 indicates the awareness of rehabilitation outcome measuring instruments according to provinces (KZN & GP) and work setting identity (public rural; public urban; and private urban).

Table 4.9.Awareness of rehabilitation outcome measuring tools per province.

Table 4.9: Awareness of Rehabilitation Outcome Measuring Tools Per Province				
Functional Independence Measure (FIM) Awareness				$Fisher's\ Exact\ Test$ $\rho - Value$
Province				<.001
	KZN	GP	TOTALS (n,253, %)	
Yes	32 (29.6%)	76 (70.4%)	108 (100%)	
No	91 (62.8%)	54 (37.2%)	145 (100%)	
Barthel Index (BI) Awareness				
Province				<.001
Yes	28 (35.4%)	51 (64.6%)	79 (100%)	
No	95 (54.6%)	79 (45.4%)	174 (100%)	
Frenchay Activity Index (FAI) Awareness				
Province				.133
Yes	5 (29.4%)	12 (70.6%)	17 (100%)	
No	118 (50.0%)	118 (50.0%)	236 (100%)	
Modified Rankin Scale (MRS) Awareness				
Province				<.001
Yes	14 (25.5%)	41 (74.5%)	55 (100%)	
No	109 (55.1%)	89 (44.9%)	198 (100%)	
Nottingham Extended Activity of Daily Living Scale (NEADL) Awareness				
Province				.706

Yes	14 (45.2%)	17 (54,8%)	31 (100%)	
No	109 (49.1%)	113 (50.9%)	222 (100%)	
Functional Independence Measure (FIM) Awareness				$Pearson$ $Chi - Square$ $\rho - Value$
Work setting Identity				<.001
Variable	Public Rural Setting	Public Urban Setting	Private Urban Setting	TOTALS (n,253, %)
Yes	28 (25.9%)	28 (25.9%)	52 (48.1%)	108 (100%)
No	71 (49.0%)	67 (46.2%)	7 (4.8%)	145 (100%)
Barthel Index (BI) Awareness				
Work setting Identity				<.001
Yes	21 (26.6%)	26 (32.9%)	32 (40.5%)	79 (100%)
No	78 (44.8%)	69 (39.7%)	27 (15.5%)	174 (100%)
Frenchay Activity Index (FAI) Awareness				
Work setting Identity				.037
Yes	3 (17.6%)	6 (35.3%)	8 (47.1%)	17 (100%)
No	99 (39.1%)	95 (37.7%)	51 (21.6%)	236 (100%)
Modified Rankin Scale (MRS) Awareness				
Work setting Identity				<.001
Yes	13 (23.6%)	13 (23.6%)	29 (52.7%)	55 (100%)
No	88 (43.4%)	82 (41.4%)	30 (15.2%)	198 (100%)
Nottingham Extended Activity of Daily Living Scale (NEADL) Awareness				
Work setting Identity				.161
Yes	14 (45.2%)	7 (22.6%)	10 (32.3%)	31 (100%)
No	85 (38.3%)	88 (39.6%)	49 (22.1%)	253 (100%)

Table 4.9 shows the awareness of rehabilitation outcome measures variables (YES or NO) against associated factors of provinces (KZN and GP); and work setting identity (public rural; public urban; and private urban). Using Fisher's Exact Test, it was found that three rehabilitation outcome measures (FIM, BI, and MRS) awareness were significantly associated with province study subjects (ρ –0.001), the null hypothesis was rejected, and the research hypothesis was accepted. Contrary to that, it was found that in two of the rehabilitation outcomes measures (FAI and NEADL) awareness were not significantly associated with province study subjects ($\rho - 0.133$ and $\rho - 0.706$) therefore the null hypothesis was favourable, and the research hypothesis was rejected.

In addition to this, using a Pearson Chi-Square test, a significant association between awareness and work setting identity was found in four of the rehabilitation measures (FIM, BI, FAI, and MARS) ($\rho - 0.001\ and\ \rho - 0.037$) the null hypothesis is rejected, and the research hypothesis is accepted. In one of the rehabilitation outcome measures (NEADL), no significant association was found between awareness and work setting identity ($\rho - 0.161$) the null hypothesis is accepted, and the hypothesis is not favourable.

Looking at provinces, in KZN 29.6% (n=32) said YES, they were aware of FIM; and in GP 70.4% (n=76) said they were aware of FIM; while in KZN 62.8% (n=91) said NO, they were not; and in GP 37.2% (n=54) said NO, they were not. KZN had 35.4% (n=28) subjects who responded YES, they were aware of BI; and in GP 64.6% (n=51) said YES, they were aware of BI; while in KZN 54.6% (n=95) said NO; and in GP 45.4% (n=79) said NO.

Only 29.4% (n=5) responded YES, they were aware of FAI in KZN; and in GP 70.6% (n=12) responded YES, they knew FAI; while in KZN 50.0% (n=118) said NO; and in GP 50.0% (n=118) said NO, they did not. KZN had 25.5% (n=14) subjects who responded YES, they knew MRS; and 74.5% (n=41) of the GP participants said YES, they were aware of MRS; while in KZN 55.1% (n=109) said NO, they did not; and in GP 44.9% (n=89) said NO, they were not.

In KZN 45.2% (n=14) said YES, they were aware of NEADL; and 54,8% (n=17) of GP participants said YES, they were aware; while in KZN 49.1% (n=109) said NO, they were not aware of NEADL; and in GP 50.9% (n=113) share the same view as KZN, that were not aware.

Provinces were further subjected to specific work setting identities such as a public rural setting; a public urban setting; and a private urban setting. In public rural settings 28 25.9% (n=28) said YES, they were aware of FIM; in public urban setting, 25.9% (n=28) said YES, they were aware of FIM; and in private urban settings 48.1% (n=52); while 49.0% (n=71) said NO, in public rural settings; in public urban settings 46.2% (n=67) said NO; 4.8% (n=7) in private urban settings said NO.

In public rural settings 26.6% (n=21) participants said YES, they were aware of BI; in public urban settings 32.9% (n=26) responded YES, they were aware of BI; and 40.5% (n=32) of participants from private urban settings said YES, they were aware of BI; while

44.8% (n=78) in public rural settings said NO, they were not aware of BI; 39.7% (n=69) in public urban settings said NO; and in private urban settings 15.5% (n=27) said NO.

In public rural settings 17.6% (n=3) subjects said YES, they knew FAI; in public urban setting 35.3% (n=6) subjects said they knew FAI; and in private urban settings 47.1% (n=8) subjects said YES, they knew FAI; while 39.1% (n=99) of participants in public rural settings said NO, they did not know FAI; in public urban settings 37.7% (n=95) participants said NO; and in private urban settings 21.6% (n=51) participants said NO.

In public rural settings 23.6% (n=13) respondents said YES, they were aware of MRS; in public urban settings 23.6% (n=13) respondents said YES; and in private urban settings 52.7% (n=29) said YES; while in public rural settings 43.4% (n=88) participants said NO; in public urban settings 41.4% (n=82) participants said NO; and 15.2% (n=30) participants in private urban settings said NO.

In public rural settings 45.2% (n=14) subjects in the study said YES, they were aware of NEADL; in public urban settings 22.6% (n=7) subjects said YES; and in private urban Settings 32.3% (n=10) subjects said YES; while in public rural settings 38.3% (n=85) participants said NO, they were not aware of NEADL; in public urban settings 39.6% (n=88) participants said NO; and in private urban settings 22.1% (n=49) participants said NO.

4.3.2. Research Question 2

Do the rural KZN, urban GP public hospitals, and private rehabilitation hospitals in KZN and GP use rehabilitation outcome measuring instruments to collect data?

Table 4.10: the use of rehabilitation outcome measuring instruments according to provinces (KZN & GP) and work setting identity (public rural; public urban; and private urban).

Table 4.10.Use of outcome measuring tools per sector & province comparison.

Table 4,10: Use of Outcome Measuring Tools Per Sector & Province Comparison				
Functional Independence Measure (FIM) use				$Fisher's\ Exact\ Test$ $\rho - Value$
Province				<.001
Variable	KZN	GP	TOTALS (n,253, %)	
Yes	17 (20.2%)	67 (79.8%)	84 (100%)	
No	106 (62.7%)	63 (37.3%)	169 (100%)	
Barthel Index (BI) use				
Province				<.001
Yes	17 (28.8%)	42 (71.2%)	59 (100%)	
No	106 (54.6%)	88 (45.4%)	194 (100%)	
Frenchay Activity Index (FAI) use				
Province				.750
Yes	4 (40.0%)	6 (60.0%)	10 (100%)	
No	119 (49.0%)	124 (51.0%)	243 (100%)	
Modified Rankin Scale (MRS) use				
Province				.002
Yes	7 (22.6%)	24 (77.4%)	31 (100%)	
No	116(52.3%)	106 (47.7%)	222 (100%)	
Nottingham Extended Activity of Daily Living Scale (NEADL) use				
Province				1.000
Yes	7 (50.0%)	7 (50.0%)	14 (100%)	
No	116 (48.6%)	123 (51.5%)	239 (100%)	
Functional Independence Measure (FIM) use				$Pearson$ $Chi - Square$ $\rho - Value$
Work setting Identity				<.001

	Public Rural Setting	Public Urban Setting	Private Urban Setting	TOTALS (n,253, %)	
Yes	15 (17.9%)	22 (26.2%)	47 (56.0%)	84 (100%)	
No	84 (49.7%)	73 (43.2%)	12 (7.1%)	169 (100%)	
Barthel Index (BI) use					
Work setting Identity					<.001
Yes	14 (23.7%)	24 (40.7%)	21 (35.6%)	59 (100%)	
No	85 (43.8%)	71 (36.6%)	38 (19.6%)	194 (100%)	
Frenchay Activity Index (FAI) use					
Work setting Identity					.116
Yes	2 (20.0%)	3 (30.0%)	5 (50.0%)	10 (100%)	
No	97 (39.9%)	92 (37.9%)	54 (22.2%)	243 (100%)	
Modified Rankin Scale (MRS) use					
Work setting Identity					<.001
Yes	6 (19.4%)	5 (16.1%)	20 (64.5%)	31 (100%)	
No	93 (41.9%)	90 (40.5%)	39 (17.6%)	222 (100%)	
Nottingham Extended Activity of Daily Living Scale (NEADL) use					
Work setting Identity					.358
Yes	6 (42.9%)	3 (21.4%)	5 (35.7%)	14 (100%)	
No	93 (38.9%)	95 (37.5%)	54 (22.6%)	239 (100%)	

Table 4.10 shows the use of rehabilitation outcome measures variables (YES or NO) against associated factors of provinces (KZN and GP) and work setting identity (public rural; public urban and private urban). Using Fisher's Exact Test Chi-Square, it was found in the use: three rehabilitation outcome measures (FIM, BI, MRS) were significantly associated with the province where study subjects were located,

(ρ –0.001 FIM, BI, and ρ –0.002 MRS) therefore the null-hypothesis was rejected , whiles the hypothesis was favourable; and there was no significant association between two rehabilitation outcome measures (FAI, NEADL) and province ($\rho - 0.750$, $\rho - 1.000$) resulting to the null-hypothesis acceptance and the hypothesis rejection.

Using the Pearson Chi-Square, it was found in the use: three rehabilitation outcome measures (FIM, BI, and MARS) were significantly associated with work setting identity ($\rho - 0.001$) thus rendering the null-hypothesis unfavourable, whiles accepting the hypothesis and two of the rehabilitation outcomes measures (FAI & NEADL) were not significantly associated with work setting identity ($\rho - 0.116$ and $\rho - 0.358$) accepting the null-hypothesis and rejecting the hypothesis.

Looking at provinces: in KZN 20.2% (n=17) said YES, they used FIM; and in GP 79.8% (n=67) said they used FIM; while in KZN 62.7% (n=106) said NO, they were not; and in GP 37.3% (n=63) said NO, they were not. KZN had 28.8% (n=17) subjects who responded YES, they use BI; and in GP 71.2% (n=42) said YES, they use BI; while in KZN 54.6% (n=106) said NO; and in GP 45.4% (n=88) said NO.

Only 40.0% (n=4) responded YES, they use FAI in KZN; and in GP 60.0% (n=6) responded YES, they use FAI; while in KZN 49.0% (n=119) said NO; and in GP 51.0% (n=124) said NO, they did not. KZN had 22.6% (n=7) subjects who responded YES, they use MRS; and 77.4% (n=24) of the GP participants said YES, they use MRS; while in KZN 52.3% (n=116) said NO, they did not; and in GP 47.7% (n=106) said NO, they did not.

In KZN 50.0% (n=7) said YES, they used NEADL; and 50.0% (n=7) of GP participants said YES, they used NEADL; while in KZN 48.6% (n=116) said NO, they were not using NEADL ; and in GP 51.5% (n=123) also said NO.

Provinces were further subjected to specific work setting identities such as a public rural setting, a public urban setting, and a private urban setting. In a public rural setting: 17.9% (n=15) said YES, they used FIM; in a public urban setting 26.2% (n=22) said YES, they used FIM; and in a private urban setting 56.0% (n=47) said YES; while 49.7%(n=84) said NO; in a public rural setting, in a public urban setting 43.2% (n=73) said NO; 7.1% (n=12) in a private urban setting said NO.

In the public rural setting, 23.7% (n=14) participants said YES, they used BI; in a public urban setting 40.7% (n=24) responded YES, they used BI; and 35.6% (n=21) of participants from the private urban setting said YES, they used BI; while 43.8% (n=85) in a public rural setting said NO, they were not using BI; 36.6% (n=71) in a public urban setting said NO; and in a private urban setting 19.6% (n=38) said NO.

In the public rural setting 20.0% (n=2) subjects said YES, they used FAI; in a public urban setting 30.0% (n=3) subjects said they used FAI; and in the private urban setting 50.0% (n=5) subjects said YES, they used FAI; while 39.9% (n=97) of participants in a public rural setting said NO, they did not use FAI; in a public urban setting 37.9% (n=92) participants said NO; and in a private urban setting 22.2% (n=54) participants said NO.

In the public rural setting 19.4% (n=6) respondents said YES, they used MRS; in the public urban setting 16.1% (n=5) respondents said YES; and in the private urban setting 64.5% (n=20) said YES; while in a public rural setting 41.9% (n=93) participants said NO; in a public urban setting 40.5% (n=90) participants said NO; and 17.6% (n=39) participants in a private urban setting said NO.

In the public rural setting 42.9% (n=6) subjects in the study said YES, they used NEADL; in a public urban setting 21.4% (n=3) subjects said YES; and in the private urban setting 35.7% (n=5) subjects said YES; while in a public rural setting 38.9% (n=93) participants said NO, they were not using NEADL; in a public urban setting 37.5% (n=95) participants said NO; and in a private urban setting 22.6% (n=54) participants said NO.

4.3.3. Research Question 3

Do the rural KZN and urban GP public hospitals have the capacity to monitor and evaluate the collection of rehabilitation outcomes data as compared to private rehabilitation hospitals in KZN and GP?

Table 4.11 indicates the provision of rehabilitation outcomes data collecting instruments and capacity support on rehabilitation outcomes data usage in association with work setting identity.

Table 14.11.Provisionof rehabilitation outcome data tools.

Table 4.11: Provision of Rehabilitation Outcome Data Tools					
Provision of rehabilitation data collecting instruments					$Pearson$ $Ch - Square$ $\rho - Value$
Rehab Instrument Resource Provision					<.001
	Public rural setting	Public urban setting	Private urban setting	TOTALS (n,253,%)	
Yes	19 (19.0%)	28 (28.0%)	53 (53.0%)	100 (100%)	
No	80 (52.3%)	67 (43.8%)	6 (3.9%)	153 (100%)	
Support for workshop training, short courses on rehab outcome data usage					
Financial Resource Provision					<.001
Yes	11 (16.4%)	10 (14.9%)	46 (68.7%)	67 (100%)	
No	88 (47.3%)	85 (45.7%)	13 (7.0%)	186 (100%)	

Table 4.11 depicts the provision of rehabilitation data collecting instruments and capacity support concerning the work setting identity. Using a Pearson Chi-Square test it was found that there was a significant association between the provision of rehabilitation data collecting instruments and work setting identity ($\rho - 0.01$) as a result the null hypothesis was rejected and the hypothesis accepted. Furthermore, it was also found that there was a significant association between capacity development on rehabilitation outcome usage and work setting identity ($\rho - 0.01$) rejecting the null-hypothesis and accepting the hypothesis.

19% of the participants (n=19) in the public rural settings said YES, they were provided with rehabilitation data collecting instruments; 28.0% (n=28) of the public urban settings participants said YES; and 53% (n=53) in the private urban settings said YES; while 47.3% (n=80) in the public rural settings said NO, there was no provision of rehabilitation outcome measures by the facility; 43.8% (n=67) in public urban settings said NO; and 3.9% (n=6) of the private urban settings said NO.

In public rural settings 16.4% (n=11) of subjects said YES, there was financial support to build capacity; 14.9% (n=10) in the public urban settings said YES; and 68.7% (n=46) said YES in the private urban settings; while in the public rural settings 47.3% (n=88) subjects said NO, they were not provided financial support to develop capacity; 45.7% (n=85) in the public urban settings said NO; and 7.0% (n=13) in a private urban settings said NO.

4.4. Summary

The researcher was able to achieve an 86% response rate and 98% valid response rate; 253 research subjects participated in the study. Those research subjects were RMTs from KZN and GP provinces, located in public rural healthcare facilities, public urban healthcare facilities, and private urban rehabilitation healthcare facilities.

The demographic characteristics indicated that more females than males participated in the study. There were more bachelor degrees represented; followed by diplomas in nursing; medical degrees in the third position; fourth were bachelor degrees in nursing; and master's degrees were well presented at sixth position out of eleven qualifications categorised as the highest level of education.

The largest proportion of participants had had fewer than three years of work experience; followed by participants that had 11-20 years of work experience; whilst the least represented group consisted of participants who had had more than 20 years of work experience. Nurses dominated the number of represented professions; followed by physiotherapists; and in the third position were occupational therapists.

All RMT members were represented. GP province had more participants than KZN province with n=130 to n=123 respectively. The public rural setting was more represented, followed by the public urban setting, with private urban setting at n=99, n=95, and n=59 respectively.

More participants (n=153) indicated that the institution they were working for did not categorically state or provide the rehabilitation outcome measure to use. When respondents were asked to name the rehabilitation outcome measure they were using, in a private setting the most common was FIM, and in the public setting, they said it was SOAP notes.

Many participants (n=148) pointed out that there was potential pressure from superiors forcing them to monitor and evaluate rehabilitation outcomes use, as compared to those who said there was no pressure (n=105). Participants strongly agreed (n=130) that South Africa needs standardisation of rehabilitation outcome measures both in public and private healthcare: n=78 agreed; n=26 were neutral; whilst only n=19 shared negative sentiments.

81 respondents agreed that their institution had identified rehabilitation information required for decision-making: also, n=52 respondents strongly agreed; while 74 respondents were not sure. More research subjects (n=141) said they collect data for "Effective clinical practice, evidence, and decision-making". A sizable number of participants said they needed a tool to assess barriers to data use (n=176); while (n=77) said they did not.

More respondents agreed (n=117) that capacity to collect, analyse and use data was needed: n=67 strongly agreed; while n=16 disagreed; and n=11 strongly disagreed. 92 (n=92) participants agreed that M&E champions were needed; followed by n=72 participants who strongly agreed; while n=52 were neutral; and n=26 disagreed.

Many study subjects (n=186) said their facility did not provide financial support towards capacity development: while n=67 said their facilities did provide financial support.

Case studies and analytical tools were not used (n=199) by institutions to improve healthcare programs; there were no (n=164) information feedback mechanisms in place; and no use (n=164) of policies, guidelines, or procedures to support rehabilitation data performance and improvement.

Fewer participants in KZN were aware (n=32) and used (n=17) rehabilitation outcome measures; while more participants in GP were aware (n=76) and used (n=67) rehabilitation outcome measures. There was a significant association between awareness and use of most rehabilitation outcome measures (FIM, BI, MARS), and province (p-0.001 and p-0.002); while there was no significant association between some of the rehabilitation outcome measures awareness and use (FAI and NEADL) and province (p-0.133 and p-0.706). Rehabilitation outcome measures sources of information were varsity undergrad (n=59); training workshops and peer learning (n=47); internet (n=22); journal articles (n=21); and varsity post-grad (n=2).

CHAPTER 5: DISCUSSION

5.1. Introduction

This chapter unpacks and interprets the research findings in detail on the bases presented in Chapter 1, Section 1.6 (research objectives), Section 1.5 (research questions), and the literature reviewed in Chapter 2. The interpretation of the results is divided into three sections: firstly, demographic details of the RMTs will be discussed (Section 5.2.); and secondly, this section addresses the objectives of the research study by discussing emerging frequencies (Section 5.3.).

Lastly, the two research questions are interpreted factoring - the awareness and use of rehabilitation outcome measuring tools in association with the provinces and work setting identity significance. Furthermore, the third research question, focusing on capacity development is discussed in association with the province and work setting identity association to test any possible significance. Lastly, this chapter will end with a conclusion (Section 5.5.).

It is important to state from the outset, that the results discussions emerging from this research study cannot be generalised to the whole community of the RMTs in South Africa. The reason behind non-generalisability of these results is that the research design adopted a non-probability approach when choosing research sites, and there was not a large enough sample size that could be representive of the entire community of RMTs, therefore this was not in accordance with Salkind’s (2017) parametric statistics assumptions. Nevertheless, even if some parametric assumptions are violated, Salkind (2017) argues that research questions are still important to respond to. With parametric assumptions being breached, the researcher then chose to use non-parametric statistics, which have less restrictive assumptions. Technically, according to Salkind (2017), parametric statistics are more powerful than non-parametric statistics, but non-parametric tests offer data analysis that caters for frequency distribution at the level of nominal or categorical variables, and therefore this was technique that this study opted for. In addition, Chi-Square non-parametric tests were used and were capable of testing associated relationships between important variables; and which answered all three research questions.

5.2 Research Objectives Discussion

5.2.1. Demographics of the Study Participants

Ascertaining the demographic characteristics representation of the study, most participants were females, while there were fewer males, with ages ranging between 21 and 65 years for both genders. Female participants depicted a higher percentage as compared to males, which suggested a normal international trend according to Boniol et al. (2019) who analysed 104 countries and found that females share a higher employment rate at 67% as compared to males in the health and social sectors.

This was further substantiated by a study done in South Africa by Mumbauer et al. (2021), which was looking at the employment preferences of healthcare workers where 71% were females and 29% were male, in a sample size of 851 respondents. With this said, there were still disparities within the healthcare sector-specific careers where women did not enjoy the majority. In South Africa, HPCSA records showed 59.4% male dominance in medical doctors, as compared to 40.6% of female medical doctors (Tiwari et al., 2021). The data suggest that females enjoy the majority representation in the healthcare sector, but this was not the case with specific career pathways in the same sector.

In this study, the representation between the two provinces did not differ by huge margins, but GP was represented by seven more respondents than KZN. More participants reported that their residential localities were in urban areas followed by rural areas. The public rural setting was represented by five more participants than the public urban setting, with the private urban setting represented the least.

Some studies have used similar categorisation across provinces and work settings of rural and urban areas in the healthcare sector. For instance, Mumbauer et al. (2021) conducted a study across three provinces of GP, Mpumalanga, and Limpopo and interacted with participants working in public and private healthcare facilities in rural and urban areas. Even though in the current study, private urban setting was represented with few participants, it did not mean that the private sector employs fewer RMTs. This was due to private healthcare service’s sub-division into acute/subacute healthcare hospitals and rehabilitation hospital specifications, which arrangement was almost non-existent in public healthcare settings.

Private rehabilitation hospitals are a smaller division of the two private healthcare subdivisions, and only five private rehabilitation hospitals participated in the current study. In contrast, in South Africa, the private or the non-public healthcare sector, surpasses (employs more) the public healthcare sector in all categories of healthcare practitioners' employment except the nursing profession (van Rensburg, 2014). The importance of categorising RMTs according to provinces, rurality, urban nature, and whether public or private healthcare, assisted the researcher to make a distinction between the differences or similarities in awareness, use of rehabilitation outcome measures, and the capacity available to monitor and evaluate collected data.

The analysed data suggested that the researcher achieved the mandate of interacting with all the RMTs as was planned on the bases explained in Chapter 3, Subsection 3.2.3. The presence of the RMTs in the approached healthcare facilities provide an opportunity to deliver the crucially needed rehabilitation services to the community; and for this study, the opportunity to test whether rehabilitation outcome measures were used or not. Previous studies had advocated for the presence of RMTs in healthcare facilities.

The Framework and Strategy for Disability and Rehabilitation Services (FSDRS) in South Africa 2015-2020 (DOH, 2015) mentioned the ideal core rehabilitation team as a physiotherapist, an occupational therapist, a speech therapist, an audiologist, an orthopaedist, and further mentioned a clinical psychologist and a social worker as support therapists, but they fell short of adding a medical doctor and a nurse. Sigh et al. (2018) described the composition of the RMT as follows: rehabilitation physician; rehabilitation nurse; occupational therapist; physiotherapist; clinical psychologist; and prosthetist.

The well-being of a patient in achieving quality rehabilitation outcomes depends on a multidisciplinary team approach, which was evident in a study by Richards et al. (2019) where different stakeholders comprising physicians, nurses, occupational therapists, physiotherapists, speech, and language therapists had their inputs in monitoring adherence to a Standardised Assessment Toolkit for rehabilitation post stroke in Canada.

More members of the nursing community participated in the study; followed by physiotherapists; then occupational therapists in the third position; then medical doctors in fourth; social workers in fifth; speech therapists occupied the sixth position; while clinical psychologists came in the seventh position; audiologists in the eighth position; and lastly, one spinal specialist / surgeon participated. Fewer than expected medical doctors participated in the study; approximately 100 medical doctors were expected to participate in both public and private facilities, but only 26 of the participants were reachable. In the public hospitals, the unavailability of medical doctors was explained by their being inundated with patients and having limited free time, while in one private rehabilitation hospital it was said that the medical officer works as a sessional doctor and is not always in the hospital site.

Significant work has been done by the physiotherapy profession in the discourse of awareness, use, and standardisation of rehabilitation outcome measures in neurological (post-stroke, brain injuries, and spinal injuries) rehabilitation in South Africa and abroad (Inglis et al., 2008; Joseph & Rhoda, 2011; Demers et al., 2019; Agyenkwa et al., 2020). However, it was not only physiotherapists that were using rehabilitation outcome measuring tools, but a multidisciplinary team approach as the tools themselves requires a diverse contribution of different professions.

For example, a Functional Independent Measure (FIM) tool had 18 items that cover 6 areas): ***Self-care***, where the occupational therapist and a nurse are best placed to evaluate this section; ii) ***Sphincter control***, a nurse should monitor this aspect; iii) ***Mobility***, a physiotherapist and occupational therapist role; iv) ***Locomotion***, a physiotherapist takes the lead; v) ***Communication***, the speech/audio therapist's responsibility; and iv) ***Social cognition***, a psychologist assesses the mental state of readiness, while the social worker integrates the social environment between hospital and home.

In concluding the scoring of the patient's performance, a consensus agreement between the multidisciplinary team is key, even though the tallying of scores is often done by one person (Ferrucci et al., 2010). In the example provided here, it was clear that the medical doctor played no practical or active role in the tool, however, the opinions of the RMT matter to the doctor, and the input of the doctor about the patient matters to other team players. It was for these reasons that determined the composition of the seven RMTs in this study.

5.2.2. Ascertain the Provision of Rehabilitation Outcome Measuring Instruments by the Institution

Effective healthcare service delivery, including rehabilitation services, requires planning of resources, accountability checks, and provision of health information administrative resources, all of which serve as powerful tools in proving evidence of rehabilitation deliverables (Gutenbrunner & Nugraha, 2018). Readiness assessment, according to Kusek and Rist (2004), requires that the healthcare institution has consulted with relevant stakeholders and agreed on relevant rehabilitation information needed to make decisions meeting the planned goals, and in the case of this study, categorically stating the rehabilitation outcome measuring instruments agreed on as a data collecting resource.

The analysed data suggest that more than 60% of the participants were not provided with rehabilitation outcome measures to use in the institution they were working for. Similar findings had been observed elsewhere. For example, Agyenkwa et al. (2020) in Ghana found that 55 of the participants (52.4%) said they were not provided with outcome measures and their facilities had not recommended any. Even though Agyenkwa and others (2020) looked at physiotherapists specifically, their results resonate well with this study's results keeping in mind that this study looked at the multidisciplinary teams. According to Agyenkwa et al. (2020), not providing the mandated data collecting instruments has led to a paucity of critical rehabilitation indicators, and fragmented data outputs, as also stated by the Framework and Strategy for Disability and Rehabilitation Services in South Africa 2015-2020 (DOH, 2015). The Framework and Strategy for Disability and Rehabilitation document (DOH, 2015) pointed out that the scarcity of relevant rehabilitation indicators, poor collection, and coordination of rehabilitation data amongst provinces and national structures has provided no proof of effective rehabilitation services delivery, and therefore, the difficulty in allocating rehabilitation resources has resulted.

The minority of participants, mostly in private healthcare, that said rehabilitation outcome measuring instruments were provided by their institution, mentioned FIM as the most used rehabilitation measure, followed by BETA, ASIA Scale, BBS, SCIM, and MOCA. At least these measures were relevant and measured at the Activity level domain according to the ICF (WHO, 2001; Salter et al., 2013). These instruments were regarded as positive contributors to the quality objective data collection required; in addition, following the suggestions of Joseph and Rhoda (2011) and Salter et al. (2013), they had strong reliability and validity attributes.

The second line of rehabilitation outcome data measuring instruments was the Goniometer, Oxford Scale, Ashworth Scale, and Visual Analog Scale (VAS), mentioned by respondents working in the public healthcare sector. These measuring instruments measured rehabilitation outcomes at an Impairment level domain according to ICF (WHO, 2001). These ROMs were measured at a physiological or structural level of impairment (joint movement or amount of pain felt) and were subjective, with poor reliability and validity attributes.

A similar study found that physiotherapists in South Africa in their patients' management relied on easy-to-use impairment rehabilitation outcome measures (Inglis et al., 2008). This concurs with these research findings, specifically with regard to therapists working in the public healthcare sector.

The analysed data suggested that participants who said they were not provided with ROM instruments reported Subjective Objective Assessment Plan (SOAP) notes as their preferred data collecting instrument; Clinical File was reported as a method of rehabilitation data collection; and Monthly Statistics as a rehabilitation data collecting instrument. Only two mentioned that they used FIM/FAM, BI, BBS, and 6 min Walk Test.

The contrast was that those participants who were provided with rehabilitation outcome measures by their institutions mentioned ROM instruments that were relevant to the instruments required to fulfil the mandate of rehabilitation outcomes quality data, demonstrating order and direction to what was necessary. On the other hand, respondents that were not provided with rehabilitation outcome measuring instruments by their institution mentioned avenues (such as SOAP, Clinical File or Monthly Statistics) that were falling outside the specific objectives of the rehabilitation outcome measures and the type of systemic recording of results required.

Healthcare servants in the public and private sectors had pressure emanating from evidence demand exerted by stakeholders. Scholars such as Kusek and Rist (2004) and Moore (2013) maintain that a combination of multilateral pressure emanating from internal and external donors or funders, requires monitoring and evaluation of rehabilitation data governance and high accountability standards. They further argue that understanding the authorities that demand evidence requires appropriate measures to respond to that kind of pressure.

The analysed data identified that about 59% of respondents said there was pressure to monitor and evaluate rehabilitation outcome measures, and 41% said there was not. Camp et al. (2020) asserts that there was unambiguous evidence that in private rehabilitation hospitals, medical aid demanded accountability that demonstrated value for money in the services provided by the rehabilitation multidisciplinary teams; however,contrary to this, in this study, there was no clear evidence that showed specific rehabilitation outcome measures data collection evidence in the public health sector. This concurs with what the DOH (2015) FSDRS found, that there is fragmented rehabilitation data collection in the public healthcare sector. Even though the majority of the respondents said there was pressure, it was not clear whether that kind of pressure was directed to rehabilitation outcomes data collection or data collection in general at the healthcare facility.

In Chapter 1, Section 1.3 (Problem statement), standardisation was highlighted as a prerogative of the National Rehabilitation policy makers who are tasked to review and consider this issue in the future. The lack of policy direction in this matter might be a cause of poor rehabilitation data outcomes. This is a critical matter that requires policy direction. It is a dream of the WHO that all countries that have endorsed the UN Convention on the Rights of Persons with Disabilities, that they adopt the world standards of collecting disability data through the gearing of social policy (FDRG,2010).

South Africa has ratified the UN Convention on the Rights of Persons with Disabilities, and with this said, and considering the gaps identified by the DOH (2015) FSDRS on rehabilitation data collection scantiness and fragmentation, therefore, respondents were asked to put forward their opinion on the standardisation of rehabilitation outcome measures. An overwhelming majority of 82.2% of participants strongly agreed and agreed that South Africa, both in public and private healthcare, needs standardisation of rehabilitation data collecting instruments; while 10.3% were neutral; with fewer than 8% of participants expressing a negative view.

Available research has pointed out that elsewhere some countries have adopted standardisation of rehabilitation data at the national level database. FDRG (2010, p 5) in ICF Overview state, “When population data use the same concepts and frameworks as administrative and service data, a strong integrated national information array can be developed”. Australia was used as an example of a country where national data standardisation based on ICF has been adopted with efforts to foster uniformity in planned aspects of rehabilitation data collection. But standardisation of rehabilitation outcome measures wasn’t always a solution, or a ‘one-size-fits-all’ experience; some barriers need to be considered, such as availability of rehabilitation instruments to use, prescriptions or licensing of instruments, time taken to complete them, and therapists' required capacity workforce (Demers, 2019).

An approach utilised by Richards et al. (2019) where different rehabilitation stakeholders were involved in discussions, a consultation process of selecting relevant targeted rehabilitation outcome measure instruments for standardisation, critical in collecting rehabilitation data was endorsed.

5.2.3. Assess Data Governance, Quality, and Appropriateness

Data governance is closely associated with information management through a monitoring and evaluation exercise, where routine rehabilitation data collection feeds into the systemic data collection on set indicators encompassing all stakeholders' needs; and furthermore, the periodic assessment of collected data sets forth the quality and appropriateness of the evidence collected (Kusek & Rist 2004; Gorgens & Kusek, 2010; Wotela, 2017b).

The analysis identified no clear outright majority that indicated if respondents’ institutions had identified rehabilitation outcomes data information needed for decision-making. Respondents were divided on the indication of streamlined data collection at their institutions, and the majority disagreed that rehabilitation outcomes data was assessed with routine health information performance; in this case the participants that were neutral in their responses were recorded as if they were disagreeing. The overall impression that emerged was that poor or insufficient data governance resulted in inadequate quality rehabilitation data outcomes and fragmented data sets outputs, as suggested by the Framework and Strategy for Disability and Rehabilitation Services 2015-2020 (DOH, 2015) document.

The analysed data suggests that 55.7% of the participants said they were collecting data for "Effective clinical practice, evidence, and decision-making”; 26.5% said it was for "Effective clinical practice”; while 17.4% said it was for “Evidence-based practice and decision-making.” This was in contrast to the results found by Inglis et al. (2008) on physiotherapists where the theme "Effective clinical practice" emerged among 82% of respondents and “Evidence-based practice” was 15%. The lack of consistency between this research and the one by Inglis and others (2008), was that in this research, answers were closed-ended (choosing from the list, therefore, creating bias), whereas in Inglis et al (2008) those were themes that emerged from qualitative questions. Wotela (2017b) has argued that the easy generalisability of quantitative research lacks in-depth quality data as compared to that produced by qualitative research.

However, the findings of this research suggest that the data collection and storage systems were well established at the healthcare institutions. The data identified that tools that assess barriers to data use were needed. There were previous studies that had used tools that evaluated barriers to the use of rehabilitation outcome measuring instruments. For instance, Richards et al. (2019) used a tool that assessed barriers to rehabilitation outcome by measuring instrument use, and the barriers identified included organisational policy, therapists’ competencies and beliefs, time constraints, and lack of teamwork, among others. Another study by Hefford et al. (2011) showed that lack of knowledge of outcome measures, pay-to-use registration fees, and difficulty in interpreting the scores, were all constraints. It was clear that developing a tool that assessed these barriers could assist in identifying them and developing mitigating strategies in response.

5.2.4. Assess the Monitoring And Evaluation Data Collecting Skills Capacity

The National Evaluation Capacity (NEC) agenda (2030) has placed the evaluation task as an alignment that requires the National Evaluation Systems (NES) to develop objectives, structures, processes, culture, human capital, and strategic technology to evaluate the knowledge that links continuous practices for the betterment of decision-making and effective accountability (United Nations, 2015). Labin et al.’s (2012) review pointed out that Evaluation Capacity Building (ECB) was an intentional effort to expand the knowledge and skills needed to improve the facility's potential to utilise and conduct the evaluation. The above-mentioned assertions necessitated the assessment of healthcare facilities' monitoring and evaluation data collecting capacity.

On education and training the National Rehabilitation Policy’s (DOH, 2000, p,15) strategies state that the "White paper on the Transformation of the Health System in South Africa has identified rehabilitation personnel as a priority". The DOH (2000) NRP further directed that higher learning institutions and individual healthcare institutions were required to support human resource planning and management capacity. But these research findings indicated contradictory results. Analysed data suggests that more than 72% of participants said there was a need for data collection, analysis, and use capacity development, while more than 73% pointed out that their institutions had never supported them with financial resources to improve data collection capacity. Other South African scholars found the same concerns elsewhere, stating inadequate skilled human resources, with little attention being paid to individual human resource development (Bateman, 2012), and deficiency in managerial capacity development (Mji et al., 2013). Provision of sufficient RMTs human resource development needs was not yet met; this was a policy matter requiring evaluation of the NRP to ascertain whether it had in reality lived up to its creation objectives.

The data suggest that more than 73% of respondents had no monitoring and evaluation champions available in their facilities, while more than 71% said leadership capacity development of rehabilitation data demand and use had been not developed; and more than 62% of respondents agreed that monitoring and evaluation champions were necessary. For a successful implementation of a functional monitoring and evaluation system, M&E champions are required to be present at all levels of governance, among the high-level officials safeguarding, promoting, and acting on M&E demands, mid-level officials tasked with managing the M& E systems' routine data collection, and entry-level officials who are ‘foot-soldiers’ implementing rehabilitation services (Gorgens & Kusek, 2010). Following the work of Kusek and Rist (2004), using this question as a monitoring and evaluation readiness assessment, the results suggested that the healthcare facilities approached in this research, were not ready for a functioning Result-Based Management of rehabilitation outcomes measuring database execution, especially at public healthcare facilities.

5.2.5. Evaluate Rehabilitation Data Use, Sharing, Packaging, Dissemination and Promotion

The fourth objective of the study was to determine the policy arrangements that the institutions were discharging to institute learning from the collected rehabilitation outcomes data, using case studies to share good practices, mapping information dissemination channels, and collaboration with other partners. The findings from the data indicate that 65% of the participants reasoned that there were no policies, procedures, and guidelines for rehabilitation outcomes data performance reviews in place. Multiple levers of policy direction are ideal to enforce health systems outcomes, and policies such as the rehabilitation data management policy which outlines standard operating procedures and guidelines for data management (Verguet et al., 2019). The lack of policy direction created legitimacy deficiencies that led to poor accountability standards.

In the collected data, it further emerged that 79% of participants did not use case studies and analytical tools to visualise gaps and take action to improve healthcare performance. According to Glinos and Wismar (2013), the use of case studies, can yields a rich variety of sources of information and learning; Furthermore, the depth and diversity of knowledge experienced from cross-provinces and diverse health sectors could have been ideal for RMTs however, this was not the case with this study's participants.

Many respondents (72%) suggested that information-mapping that tracked data sources (rehabilitation outcome instruments and relevant stakeholders) to its final use (decision-making) was not followed at their facilities. Other studies emphasised that the use of information may assist on several fronts: i) when the collected information is not sufficient and appropriate for decision-making; ii) when stakeholders such as funders and patients could benefit from it; and iii) when program performances were under review (Measure Evaluation 2011). Therefore, the opportunity to scrutinise rehabilitation outcomes data, to evaluate its useability and the impact it had on the stakeholders, was missed.

This research findings suggested that 73% of respondents did not witness or participate in any public-private learning collaboration partnerships across provinces. Some studies had highlighted these issues before. Kula and Fryatt (2014) pointed out that there were public-private healthcare partnerships policies in place, but these partnerships were scanty and under-documented. In their review, they made examples of public-private healthcare partnerships, such as where the provincial departments of health and private groups, had a private-public partnership in which Netcare upgraded public hospitals and rented space to provide private services within the public facilities with the objective to share physicians' scarce resources, maintain infrastructure, and improve service delivery. Contrary to their findings, in this study, there was no document or published evidence that demonstrated collaboration partnerships specifically for rehabilitation data collection between public-private sectors across provinces. With concerted effort, public-private partnerships were possible with the specific objective of rehabilitation data collection and beyond, for the sharing of information and learning from each other.

5.2.6. Determine Knowledge, Use, and Source of Education about Rehabilitation Outcome Measuring Instruments

The objective of the study was to ascertain the knowledge, use, and sources of education about rehabilitation outcome measuring instruments. As was said by Morris et al. (2019), Mji et al., (2013, the DOH (2015), and Porter and Goldman (2013), a general lack of data evidence demand estimating the value benefit resulting from rehabilitation services benefit to South African people, renders it difficult to provide resources funding for this service. The study looked at avenues that could assist to improve the quality of data collected. There were rehabilitation outcomes data collecting instruments that could objectively identify the effectiveness or lack of rehabilitation services (Salter et al., 2013; Joseph & Rhoda, 2011). With this said, the study tried to determine whether the RMTs were aware of these tools, or if they were using these tools, what were the sources of information they used to learn about them.

Five of the ICF-selected rehabilitation outcomes measuring tools were put to the respondents for awareness and use. The analysed data found that in all rehabilitation outcome measuring tools, the majority of the respondents were not aware of the tools

(FIM=57%; BI=68.8%; FAI=93%; MRS=78%; NEADL=87.7%) and were not using them (FIM=66.6%; BI=76.7%; FAI=96%; MRS=87.7%; NEADL=94.5%); even though, awareness of the tools was better than use, meaning there was more awareness of tools than use of tools. This was in agreement with similar findings that were found in the awareness and use of rehabilitation outcome measures in South African physiotherapists in the study reported by Inglis et al. (2008); and physiotherapists in Ghana where non-use of rehabilitation outcome measures 31 (29.5%) was reported by Agyenkwa et al. (2020). The non-use of rehabilitation outcome measuring tools suggested the lack of credible data that extensively expresses the effectiveness of rehabilitation outcomes. Furthermore, when the source of knowledge about rehabilitation outcomes was asked from the respondents, 23% of respondents mentioned undergraduate curriculum as the main source of knowledge about rehabilitation outcome measuring tools; and an even split of 18.6% of participants highlighted training workshops and peer learning as sources of information. These findings were contrary to the similar study reported by Inglis et al. (2008) on South African Physiotherapists, where they found journal articles as the main source of information. It is possible that because this study was based on the RMTs and conducted in 2022, conditions regarding university undergrad teaching and learning may have changed.

5.3. Research Questions and Results Discussion

Three research questions were asked in this research. Section 5.4 attended to the research questions discussion of the results with the specific intentions of associating the results with the province and work setting identity.

5.3.1. Research Question 1

Are rural public hospitals in KZN, urban GP public hospitals, and private rehabilitation hospitals in KZN and GP aware of rehabilitation outcome measuring instruments to use when recording the progress or regress of therapy?

The results suggested that in GP, three of the rehabilitation outcome measures (FIM=70.4%, *p=0.001*; BI=64.6%, *p=0.001*; and MRS=74.5%, *p=0.001*; respectively) were significantly associated with awareness, as more participants were aware of rehabilitation outcome instruments; while in KZN three of the rehabilitation outcome measures (FIM=62.8%, *p=0.001*; BI=54.6%, *p=0.001*; and MRS=95.1%, *p=0.001;* respectively) were significantly negatively associated with awareness, as the majority of participants were not aware of the rehabilitation outcomes. There was no significant association between the two rehabilitation outcome measures awareness (FAI, *p=0.133;* and NEADL, *p=0.706*) in the two provinces of GP and KZN. The significance of these results was that GP RMTs were more aware of rehabilitation outcome measuring instruments, as compared to KZN RMTs who were not.

In conclusion, the Chi-square test of independence with the significance level of $p < 0.001$on the three outcome measures (FIM, BI, MRS) meant the null-hypothesis 2 which stated that – "*public hospitals and private rehabilitation hospitals in GP are not aware of ROM instruments to use when recording progress or regress of therapy"* was rejected and the research hypothesis 2 which stated – *"public hospitals and private rehabilitation hospitals in GP are aware of ROM instruments to use when recording progress or regress of therapy"* was accepted, on the other hand, the null-hypothesis 1 that stated that – "*public hospitals in the province of KZN are aware of ROM instruments to use when recording progress or regress of therapy"* was rejected and the research hypothesis 1 that stated that- "*public hospitals in the provinces of KZN are not aware of ROM instruments to use when recording progress or regress of therapy*" was accepted.

But in contras for the two rehabilitation outcome measures (FAI, and NEADL) with the p < 0.133 and p < 0.706 meant the null-hypothesis 1 was accepted hypothesis 1 rejected in both KZN and GP. This does not mean they were using the two ROMs, but some other systemic issues were at play.

The analysed data found that in the private urban settings, three of the rehabilitation outcome measures (FIM=48.1%, *p=0.001*; BI=40.5%, *p=0.001;,* MRS=52.7%, *p=0.001*; respectively) were significantly associated with awareness of rehabilitation outcome measuring instruments; while it was not the same with the public rural settings (FIM=49.0%, *p=0.001*; BI=44.8%, *p=0.001*; and MRS=43.4%, *p=0.001*); and the public urban settings (FIM=46.2%, *p=0.001*; BI=39.7%, *p=0.001*; and MRS=41.4%, *p=0.001*; respectively), which were significantly negatively associated with the awareness of rehabilitation outcome measuring instruments. The significance of this outcome was that private urban settings were mostly aware of the rehabilitation outcome measuring instruments, while public urban settings and public rural settings were not. In the final results of the Research Question 1 assessment, the analysed data suggested that the GP RMTs were aware of rehabilitation outcome measures, especially in private urban settings; while in KZN and GP, in both public urban settings and public rural settings, that was not the case.

Using the Chi-square of independence in the private urban settings the three ROMs (FIM, BI, MRS) at the significance level of p< 0.001 indicated that the null-hypothesis 5 which stated that – *“rehabilitation hospitals in the private urban settings of GP were not aware of ROM instruments to use when recording progress or regress of therapy”* was rejected and the research hypothesis 5 which stated that – *“rehabilitation hospitals in the private urban settings of GP were aware of ROM instruments to use when recording progress or regress of therapy”* was accepted. The same ROMs (FIM, BI, MRS) level of significance of p< 0.001 proved that the null-hypothesis 3 and 4 which stated that – *“hospitals in the public rural settings of KZN and public urban of GP were aware of ROM instruments to use when recording progress or regress of therapy”* was not favourable and the research hypothesis 3 and 4 which stated that – “*hospitals in the public rural settings of KZN and public urban of GP were not aware of ROM instruments to use when recording progress or regress of therapy” was* favourable.

5.3.2. Research Question 2

Do the rural KZN, the urban GP public hospitals, and the private rehabilitation hospitals in KZN and GP use rehabilitation outcome measuring instruments to collect data?

The analysed data suggested GP had three rehabilitation outcome measures (FIM=79.8%, *p=0.001*; BI=71%, *p=0.001*; and MRS=77.4%, *p=0.001*; respectively) that were significantly associated with rehabilitation outcome measuring instruments use; KZN had three rehabilitation outcome measures (FIM=62.7%, *p=0.001*; BI=54.6%, *p=0.001*; and MRS=48.6%, *p=0.001*) that were significantly negatively associated with the use of rehabilitation outcome measuring instruments. No significant association was found between the two rehabilitation outcome measures (FAI, *p=0.750* and NEADL, *p=1.000*). The significance of this finding was that GP province RMTs were using rehabilitation outcome measure instruments, while KZN's RMTs were not.

Data suggest that in private urban settings four rehabilitation outcome measures (FIM=56.0%, BI=35.6%, MRS=64.5%, *p*=0.001 and FAI=47.1%, *p=0.037)* were significantly associated with the use of rehabilitation outcome measuring instruments; while it was not the case in public urban settings where four of the rehabilitation outcome measures (FIM=43.2%, BI=36.5%, MRS=40.5%, p=0.001and FAI=35.3%, *p=0.037*), and public rural settings (FIM=49.7%, BI=43.8%, MRS=41.9%, *p*=0.001, FAI=17.6%, *p=0.037*) were significantly negatively associated with the use of rehabilitation outcome measuring instruments. The NEADL, *p=0.358* rehabilitation outcome measure had no significant association with the use of rehabilitation outcome measuring instruments in all settings. The significance of this result was that private urban settings in GP RMTs were using rehabilitation outcome measuring instruments; while both public urban and public rural settings RMTs were not. Contrary to the findings of this research, a study by Agyenkwa et al. (2020) in Ghana, found that physiotherapists working in private healthcare settings (16.2%) used rehabilitation outcome measures which was fewer than physiotherapists in public healthcare settings (56.2%). In Ghana, this was partially attributed to the poor monitoring and audit scrutiny of the private sector, but in South Africa, medical aid schemes mandated the use of rehabilitation outcome measures (Camp, Casteleijn & Thupae, 2020). After data analysis for Question 2 outcomes, the findings suggest that in GP RMTs were using rehabilitation outcome measures, especially in private urban settings; while in KZN and GP, in public urban settings and public rural settings they were not used.

In conclusion, the Chi-square of independence of p< 0.001 level of significance in three ROMs (FIM, BI, MRS) suggested that the null-hypothesis 2 which stated that – "*public hospitals and private rehabilitation hospitals in GP were not using ROM instruments to collect data"* was rejected and the research hypothesis 2 which stated that- *"public hospitals and private rehabilitation hospitals in GP were using ROM instruments to collect data"* was accepted. Observing the same ROMs with the significance level of p<0.001 rejected the null-hypothesis 1 that stated- "*public hospitals in the provinces of KZN were using of ROM instruments to collect data"* and accepted research hypothesis 1 that said – "*public hospitals in the provinces of KZN were not using ROM instruments to collect data".* The two ROMs (FAI and NEADL) with the p< 0,750 and p< 1.000 respectively were not associated with any of the provinces.

In the research setting identity the Chi-square of independence with the level of p< 0.001 and p< 0.037 on the ROMs (FIM, BI, MRS and FAI respectively) revealed that the null-hypothesis 5 which stated that – *"rehabilitation hospitals in the private urban settings of GP were not using ROM instruments to collect data"* was rejected and the research hypothesis 5 that said – *"rehabilitation hospitals in the private urban settings of GP were using ROM instruments to collect data"* was accepted. Contrary, the Chi-square of independence with the confidence level of p< 0.001 and p< 0.037 on the ROMs (FIM, BI, MRS and FAI respectively) pointed out that the null-hypothesis 3 and 4 which said – *"hospitals in the public rural settings of KZN and public urban hospitals settings of GP were using ROM instruments to collect data"* was not favourable and the research hypothesis that said *"hospitals in the public rural settings of KZN and public urban settings of GP were not using ROM instruments to collect data"* was favourable. The NDEAL ROM with the p< 0.358 was not associated with any of the research settings.

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5.3.3. Research Question 3

Do the rural KZN and urban GP public hospitals have the capacity to monitor and evaluate the collection of rehabilitation outcomes data as compared to private rehabilitation hospitals in KZN and GP?

Analysed data suggests that there was a significant association between rehabilitation outcome measure instruments provision and private urban settings (53%, *p=0.001)*; while there was a significant negative association between rehabilitation outcome measure instruments and public urban settings (28.0%, *p=0.001)* / public rural settings (19.0%, *p=0.001)*. This finding suggests that resources to monitor and evaluate data collection were offered in private urban settings; while in public urban and public rural settings resources to monitor and evaluate data collection were not provided.

To conclude by using the Chi-square of independence at the significance level of p< 0.001, the null-hypothesis 3 which said – *"rehabilitation hospitals of private urban settings in GP do not provide ROM data collecting instruments"* was rejected and the research hypothesis 3 which said – *"rehabilitation hospitals of private urban settings in GP do provide ROM data collecting instruments"* was accepted. The opposite transpired in the public rural of KZN and public urban GP settings where the null hypothesis 1 and 2 that said – "hospitals in the public rural settings of KZN and public urban settings of GP do provide ROM data collecting instruments" was rejected and the research hypothesis 1 and 2 which stated – *"hospitals in the public rural settings of KZN and public urban settings of GP do not provide ROM data collecting instruments"* was accepted.

Furthermore, the analysis identified that there was a significant association between financial support for training on rehabilitation outcomes data usage and private urban settings (68.7%, *p=0.001)*; while there was a significant negative association between financial support for training on rehabilitation outcome data uses and public urban (14.9%, *p=0.001)* / public rural settings (16.4%, *p=0.001)*. The significance of this finding was that in private urban settings rehabilitation outcome measure instruments to monitor and evaluate data collection and financial support for training on rehabilitation outcome data used were provided, but in public urban / public rural settings that was not the case.

The Chi-square of independence at the significance level of $p < 0.001$ suggested that the null-hypothesis 6 that stated – *“there was no financial support provision for ROM data collecting tools training/workshops in the private urban settings of GP”* should be rejected and the research hypothesis 6 that said – *“there was financial support provision for ROM data collecting tools training/workshops in the private urban settings of GP”* should be accepted. Contrary, the null-hypothesis 4 and 5 which said – *“there was financial support provision for ROM data collecting tools training/workshops in the public rural settings of KZN and public urban settings of GP”* was rejected and the research hypothesis 4 and 5 that said – “*there was no financial support provision for ROM data collecting tools training/workshops in the public rural settings of KZN and public urban settings of GP” was accepted.*

5.4. Conclusion

72% of the estimated research sample size was reached; all seven targeted RMT members (medical officer; nurse; physiotherapist; occupational therapist; speech/audio Therapist; clinical psychologist; and social worker) participated in the study. There was not much difference between the representation in the two provinces of KZN and GP even though GP was represented by seven more participants than KZN. More of the nursing community was represented in the study, followed by physiotherapists, and lastly came audiologists. A lower number of medical officers (26) participated in the study than expected (100), but this was attributed to limited free time as they were inundated with a large number of patients to attend to. Proper planning would have assisted, such as the possibility of negotiating appointments during their lunchtime or after work.

More than 60% of the respondents were not provided with rehabilitation outcome measuring tools to use at their facility, and the few participants who said they were provided, mentioned FIM as the most used rehabilitation outcome measure. The effect of rehabilitation outcome measures' non-use resulted in poorly coordinated data collection, compromising accountability. 82% of the participants favoured the idea of the standardisation of rehabilitation outcome measuring instruments in South Africa, both in private and public practice. This is a policy matter that needs direction and improvements from the National Rehabilitation Policy.

The collected data suggests that insufficient data governance controls measure negatively impacted the quality of rehabilitation data, resulting in data fragmentation and the inability to use it for resource planning. More than 72% of the participants said they needed the capacity to collect, collate, analyse, and use data; and 73% were never supported with financial resources to improve rehabilitation data collection capacity, which agreed with the observed gap of poor rehabilitation data collection. It emerged from the collected data that there were no policies, procedures, and guidelines in place that outlined data collection, data reviews, and data performance. No collaboration or partnerships or learning opportunities between public and private hospitals with a specific interest in rehabilitation outcome measures data collection were discovered. Findings from the data exposed a poor rehabilitation data collecting culture of the organisations.

CHAPTER 6: CONCLUSIONS

6.1. Introduction

The conclusion subsection summarises the study findings which will first be discussed. Comparison of the conducted study with other previous studies will be elaborated before explaining the unanticipated findings from the study conducted. During the analysis, conclusions were drawn which indicate the implications for the sector of disability and rehabilitation incorporating M & E tools, this will be discussed in the third section.

The fourth subsection provides the explanation of the beyond control limitations and single delimitation which occurred during the processes of the study. Recommendations are stipulated before the conclusion of the chapter, as the last point of discussion.

6.2. Main Findings

The 253 participants in the study were spread across 13 research sites from the two provinces of KZN and GP. The demographic characteristics indicated more females than males. The highest representation of qualification was from bachelor's degrees, followed by diplomas in nursing; then medical degrees in third position; followed by bachelor's degrees in nursing in fourth position; master's degrees were well represented at sixth position out of eleven qualifications categorised as the highest level of education.

Regarding years of experience, a large portion had fewer than three years of work experience. GP had more participants than KZN province with n=130 to n=123 respectively. Public rural settings were more represented, followed by public urban settings; with private urban settings the least, at n=99, n=95, and n=59 respectively. Many participants (n=148) pointed out that there was potential pressure from superiors forcing them to monitor and evaluate rehabilitation outcomes use, as compared to those who said there was no pressure (n=105).

More respondents agreed (n=117), or strongly agreed (n=67) that capacity to collect, analyse, and use data was needed; while n=16 disagreed and n=11 strongly disagreed. 92 (n=92) participants agreed that M&E champions were needed, followed by n=72 participants who strongly agreed, while n=52 were neutral and n=26 disagreed. Many study subjects (n=186) said their facility did not provide financial support towards capacity development, while n=67 said their facilities did provide financial support.

Fewer participants in KZN were aware (n=32) and used (n=17) rehabilitation outcome measures; while more participants in GP were aware (n=76) and used (n=67) rehabilitation outcome measures. There was a significant association between awareness and use of most rehabilitation outcome measures (FIM, BI, MARS), and province (p-0.001 and p-0.002), while there was no significant association between some of the rehabilitation outcome measures awareness and use (FAI and NEADL) and province (p-0.133 and p-0.706).

6.2.1. Relationship of the Current Study to Other Research

Available literature suggested that a lot of research work had been done by the physiotherapy profession on rehabilitation outcome measuring instruments use (Inglis et al., 2008; Richards et al., 2019 Agyenkwa et al., 2020), but rehabilitation outcome measures were not only exclusively developed for physiotherapy use. This being the case, in this study, it was decided to opt for a multidisciplinary team approach in the inquiry of rehabilitation outcome measures use, as rehabilitation instruments themselves required a multidisciplinary team approach.

Researchers such as Myezwa and Van Niekerk (2013) and Mji et al. (2013) had voiced dissatisfaction arising from the lack of rehabilitation data indicators that measure rehabilitation benefits. There was scanty rehabilitation data availability nationwide (DOH, 2015) due to the lack of use of rehabilitation outcome measures. In addition, there was unknown monitoring and evaluation capacity availability of RMTs capacitated to collect rehabilitation data.

Firstly, the DOH (2000) National Rehabilitation Policy does not mandate the standardisation of rehabilitation outcome measures usage, which was a policy matter for review. Secondly, no research was found in South Africa that has gone beyond physiotherapists on the use of rehabilitation outcome measures data collecting instruments and focused on the RMT in public and private healthcare facilities located in rural and urban settings.

The ICF framework anchored a foundation for choosing rehabilitation outcome measures that could record credible rehabilitation data, which were put to the RMTs to ascertain if they knew about them and if they used them (WHO, 2001; Salter et al., 2013; Inglis et al., 2008). Moore (2013). Public Value Theory highlighted the importance of the authorising environment that legitimises policy amendments leading to improved levels of monitoring and evaluation of data governance (Kusek & Rist, 2004); and resources such as financial support and human resource capacity development (Gorgens & Kusek, 2010).

6.2.2. Explanation of Unanticipated Findings

Some of the RMT members (respondents) heard for the first time about the concept of rehabilitation outcome measures and monitoring and evaluation.

Only GP-based private urban settings had a significant association with awareness and use of three rehabilitation outcome measures (FIM, BI, MRS); while KZN and GP public rural settings and public urban settings had a significant negative association with the three rehabilitation outcome measures (FIM, BI, MRS). For answers to Research Questions 1 and 2, analysed data suggested that KZN and GP public healthcare facilities RMTs were not aware and not using rehabilitation outcome measuring instruments, while private rehabilitation healthcare facilities in GP were aware of them and using them.

The was a significant association between the provision of rehabilitation data collecting instruments, financial support for capacity development, and Private Urban Settings, while there was a significant negative association between the same prospects and Public Urban/Rural Settings. For research question 3 answer, analysed data suggested that there was no provision of rehabilitation instruments resources and financial support to rehabilitation multidisciplinary teams working in KZN and GP public healthcare, while the was rehabilitation instruments resource provision and financial support in Private rehabilitation healthcare facilities.

6.3. Implication for The Practice :Disability and Rehabilitation should consider developing the Theory of Change to improve rehabilitation data collection and use.

(Wotela, 2017a) suggests that rehabilitation specialists and therapists practising in the field of neuro-spinal rehabilitation, should consider a Systems Thinking approach that engages the diagnostic evaluation process; and thus, seek to uncover the root causes of the rehabilitation data starvation problem, and thereby engaging in the Theory of Change to demonstrate how the change will take place.

Cause-effect relationship pathways that may lead to attribution to specific rehabilitation data needs identification are critical to follow to the latter (Rogers, 2014; Rogers, 2008). In the Theory of Change, matters of rehabilitation data collection capacity development, training workshops on rehabilitation outcome measure instruments use, rehabilitation outcome measures resources, and financial resources should be discussed.

A consensus agreement by all parties with a significant level of ‘buy-in’ should yield a well-composed Monitoring and Evaluation Framework for rehabilitation data management. Lastly, this rehabilitation data Monitoring and Evaluation Framework should be integrated/fed to the national health database for information resources planning.

6.4. Limitations and Delimitations of the study

Based on the nature of a quantitative research strategy, a deductive approach that puts attention on the quantification of numbers in the process of collecting, collating, and analysing data, mostly uses close-ended questionnaires, and allows a limited freedom of expression (Bryman, 2016). Therefore, an opportunity to gain an in-depth understanding of the challenges that the RMTs experience were diminished. Usually, this is possible with a qualitative research strategy that emphasises the inductive approach through open-ended questions (Wotela, 2017b).

Thus, a qualitative research study into the healthcare facilities of the two provinces of KZN and GP is suggested to inform the theory that should strengthen rehabilitation outcome measures used in the future. Furthermore, the nature of the once-off data collection of the cross-section research design meant that those who were not present at work during the data collection period missed out, thus affecting the sample size of the study as it depended on a short and fixed period.

In public healthcare settings, there were only two facilities that specialised in rehabilitation (neurology and spinal cord injuries) nationwide. One was located in Pretoria and the other was located in Cape Town, but neither of them were included in the study, due to time constraints in gaining ethics approval, especially with the one located in Pretoria; and moreover, the facility located in Cape Town was at too great a distance; and logistical arrangements such as funding did not allow long-distance travel as the study was self-funded.

The only delimitation was that only associations concerning the studied population of rehabilitation therapists around KZN and GP hospitals were made because of the research design, sampling technique, and sample size limitations. The fact that parametric statistics are more powerful than non-parametric statistics prevailed in the study. A bigger sample size that involved all provinces and used advanced sampling methods that involved healthcare councils' registers, as well as more financial and human resources, could have provided higher possibilities to generalise the study.

6.5. Recommendations for Further Research

Firstly, the results of the current study indicate that it is necessary to standardise the use of rehabilitation outcome measures instruments in both public and private healthcare. Policy levers such as the National Rehabilitation Policy (DOH, 2000) in South Africa should introduce policy reviews that cater for incentivising the standardised use of rehabilitation outcome measures instruments, and monitoring the alignment to specific national rehabilitation data outcomes demands. Furthermore, it is recommended that the National Department of Health, at provincial, and district healthcare levels, develops uniform policies that outline rehabilitation data collection procedures and guidelines for use.

Secondly, at the level of a national health database collection, the development of rehabilitation indicators that clearly articulate the effectiveness of rehabilitation services must be promoted. This was emphasised by the UN CRPD (2007) Articles 31 and 33 and the ICF (WHO, 2001). Further research that demonstrates the practical use of rehabilitation outcome measures data collection, in clinical practice within the context of RMTs is greatly recommended to build a body of knowledge in this discourse, especially in South Africa.

Thirdly, the study results showed a need for rehabilitation workforce capacity-building development and consultations with different stakeholders occupying the disability and rehabilitation field of study. Rehabilitation Multidisciplinary Teams (RMTs), government entities, such as the Department of Health, the Department of Social Development, the Department of Women Youth and Persons with Disabilities, the Department of Planning Monitoring and Evaluation, NPOs, Civil Society and people with disabilities need to consult with institutions of higher learning, and other role players offering specialised rehabilitation training and data management. This consultative process should identify and develop capacity skills sets needed to use rehabilitation outcome measures, to collect, collate, analyse data, use data in decision-making, and finally evaluate the effectiveness of the rehabilitation programme.

6.6. Conclusions

The research topic challenged the crossing over of provincial boundaries and interacting with two different healthcare settings possessing huge discrepancies in their funding structures. This provided the opportunity to learn about the disparities that lie between these healthcare facility settings. A closer focus on rehabilitation outcome measuring data instruments and data use took centre stage, questioning the reasons behind poor rehabilitation data outputs as relayed by the FSDRS (DOH, 2015), and also identifying the human resources who are required to collect quality, rich, and usable rehabilitation data.

13 hospitals participated in the study. Multistage sampling was conducted: purposive sampling to choose healthcare facilities; stratified sampling together with 100% sample representation of the smaller population. Collected data were processed to a Microsoft Excel Spreadsheet, and SPSS was used to run the statistical tests. Association relationships were sought to respond to the research questions through Chi-Square non-parametric statistics tests.

RMTs were identified as the type of human resource stakeholders that carry the task of collecting, collating, and analysing rehabilitation data. A question was raised as to whether they were equipped enough to monitor and evaluate the rehabilitation data management task. The research aim was realised. The data suggested that in KZN and GP public healthcare facilities were not using rehabilitation outcome measures, while in GP the private rehabilitation hospitals facilities were using them.

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APPENDIX A - **Data Collection Instrument: Empty Survey tool**

Instruction: Please circle the number beside your chosen answer

1. Demographics characteristics

1.1. Gender:

Male	Female
1	2

1.2. Age: ______________________________

1.3. Highest level of education: ______________________________

1.4. Years of experience:

less than 3	3-5	6-10	11-20	More than 20
1	2	3	4	5

1.5. Residential locality:

Rural Area	Peri-Urban Area	Urban Area
1	2	3

1.6. Working setting identity:

Public rural setting	Public urban setting	Private urban setting
1	2	3

1.7. Your Profession: ______________________________

1.8. Level of Practice: ______________________________

e.g. (Rehab manager, Deputy director, Senior Therapist, Junior Social Worker)

2. Resources for Rehabilitation outcomes data collection measuring instruments:

2.1. Has the institution you are working for categorically indicated (provided) the official rehabilitation outcome data collection measuring instrument to use?

YES	NO
1	2

2.2. If your answer in 2.1. is YES (1), please provide the name of the rehabilitation outcome data measuring instrument.

2.3. If your answer in 2.1. is NO (2), what do you use to report progress or regress of your rehabilitation outcomes on your personal capacity as a rehabilitation practitioner?

Please provide only the name of the measuring instruments (tools)

2.4. At your institution, do you have any potential pressures that encourages you to monitor and evaluate rehabilitation outcomes data?

YES	NO
1	2

2.5. Rehabilitation practice in South Africa both public and private sectors need standardization and formalized uniform rehabilitation data collecting instrument(s)

Strongly disagree	Disagree	Neutral/Not sure	Agree	Strongly agree
1	2	3	4	5

3. Data collection and information Usage:

3.1. Your institution has identified rehabilitation outcomes information needed to inform decision-making.

Strongly disagree	Disagree	Neutral/Not sure	Agree	Strongly agree
1	2	3	4	5

3.2. Does your institution (organization) collect a streamlined rehabilitation data?

YES	NO
1	2

3.3. What are the reasons for rehabilitation data collection in your institution?

Is it for effective clinical practice?	Is it for evidence-based practice and decision-making?	Is it for both 1 and 2
1	2	3

3.4. In your institution, is there a system (electronic or handwritten documents) that rehabilitation outcomes data is collected, collated, and stored?

YES	NO
1	2

3.5. If your answer in 3.4. is YES (1); What kind (type) of data aspects are reported by your system?

Is it reporting demographic data only (age, name, diagnosis, residential details)?	Is it reporting the number of rehabilitation patients that have been serviced in a day or in a month's period?	Is it reporting the level of functional activity limitation scores from admission assessments of the patient and compering scores at discharge?	Is your data collecting system reports both 1 and 2?	Is your data collecting system reports all 1, 2 and 3
1	2	3	4	5

3.6. Your institution assesses rehabilitation outcomes data use as it assesses routine health information system performance.

Strongly disagree	Disagree	Have no idea	Agree	Strongly agree
1	2	3	4	5

3.7. Does your institution need a tool that assess barriers to data use?

YES	NO
1	2

4. Skills capacity required to monitor and evaluate the collection of rehabilitation outcomes data:

4.1. Your institution needs capacity to collect, analyse and use data?

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	2	3	4	5

4.2. Has your institution provided resources such as financial support to conduct workshops, on site trainings events, short courses on how to use rehabilitation outcome data collection measuring instruments?

YES	NO
1	2

4.3. If your answer in 4.2. is YES (1), please provide the name of the rehabilitation outcome data collection measuring instrument that you have been trained on.

____

4.4. Does your institution have monitoring and evaluation champions that are tasked to ensure that rehabilitation outcomes data is collected and reported?

YES	NO
1	2

4.5. Has your institution developed leadership capacity for data demand and use?

YES	NO
1	2

4.6. Your institution needs departmental monitoring and evaluation champions to enhance rehabilitation outcomes data collection?

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	2	3	4	5

4.7. Are there any challenges that you encounter, that prevents you from collecting rehabilitation outcomes data?

YES	NO
1	2

5. <u>Accessibility, availability, and promotion of data use in the organisation:</u>

5.1. Has your institution used case studies, visualize gaps, and analyse data from your institution for rehabilitation outcomes and other health programme improvement?

YES	NO
1	2

5.2. Has your institution used information MAP (mapping) to strengthen multidirectional data feedback mechanisms?

YES	NO
1	2

5.3. Does your institution have procedures and policies outlining guidelines for rehabilitation outcomes data review meetings, to assess and improve performance?

YES	NO
1	2

5.4. Has your institution collaborated data documentation with other public, private institutions in the province or other provinces, to share lessons using case studies or rehabilitation programmes outcomes targeting? (Example: Associate awards across provinces and public-private partnerships)

YES	NO
1	2

6. Clinical awareness/knowledge and use of rehabilitation outcomes measuring instruments:

Below are the most clinically used rehabilitation outcome measures for Functional Activity Measure (measure for activity limitation or disability) that can be used to assess rehabilitation outcomes scores progress, from patient's admission to discharge from the institution (rehabilitation hospital).

6.1. Please indicate the rehabilitation outcome measure instrument that you know with a YES (1) or NO (2).

Functional Independence Measure (FIM)	
YES	NO
1	2
Barthel Index (BI)	
YES	NO
1	2
Frenchay Activity Index (FAI)	
YES	NO
1	2
Modified Rankin Scale	
YES	NO
1	2
Nottingham Extended Activity of Daily Living Scale	
YES	NO
1	2

6.2. Please indicate the rehabilitation outcome instrument measure that you have used with a YES (1) or NO (2).

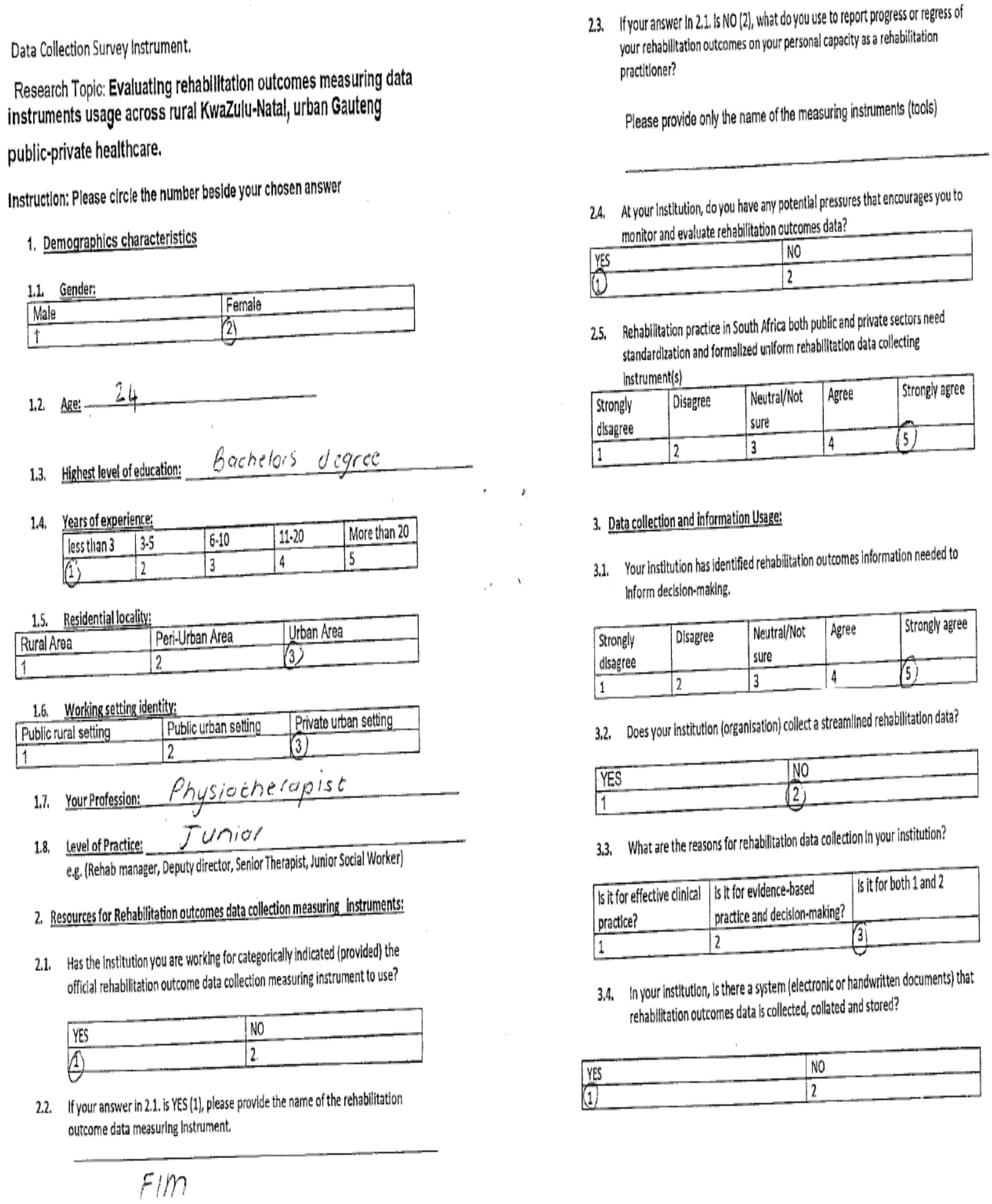
Functional Independence Measure (FIM)	
YES	NO
1	2
Barthel Index (BI)	
YES	NO
1	2
Frenchay Activity Index (FAI)	
YES	NO
1	2
Modified Rankin Scale	
YES	NO
1	2
Nottingham Extended Activity of Daily Living Scale	
YES	NO
1	2

6.3. Where did you learn about the rehabilitation outcome measure data collecting instrument (s) that you have chosen above?

Journal article	1
Internet	2
Training workshop	3
Varsity undergrad curriculum	4
Varsity postgrad curriculum	5
Peer learning/ from work colleagues	6

THE- END

APPENDIX B - Data Collection Instrument: Filled Survey tool



Data Collection Survey Instrument.

Research Topic: **Evaluating rehabilitation outcomes measuring data instruments usage across rural KwaZulu-Natal, urban Gauteng public-private healthcare.**

Instruction: Please circle the number beside your chosen answer

1. **Demographics characteristics**

1.1. **Gender:**

Male	Female
1	[✓ 2]

1.2. **Age:** 24

1.3. **Highest level of education:** Bachelors degree

1.4. **Years of experience:**

less than 3	3-5	6-10	11-20	More than 20
[✓ 1]	2	3	4	5

1.5. **Residential locality:**

Rural Area	Peri-Urban Area	Urban Area
1	2	[✓ 3]

1.6. **Working setting identity:**

Public rural setting	Public urban setting	Private urban setting
1	2	[✓ 3]

1.7. **Your Profession:** Physiotherapist

1.8. **Level of Practice:** Junior
e.g. (Rehab manager, Deputy director, Senior Therapist, Junior Social Worker)

2. **Resources for Rehabilitation outcomes data collection measuring instruments:**

2.1. Has the institution you are working for categorically indicated (provided) the official rehabilitation outcome data collection measuring instrument to use?

YES	NO
[✓ 1]	2

2.2. If your answer in 2.1. is YES (1), please provide the name of the rehabilitation outcome data measuring instrument.

FIM

2.3. If your answer in 2.1. is NO (2), what do you use to report progress or regress of your rehabilitation outcomes on your personal capacity as a rehabilitation practitioner?

Please provide only the name of the measuring instruments (tools)

2.4. At your institution, do you have any potential pressures that encourages you to monitor and evaluate rehabilitation outcomes data?

YES	NO
[✓ 1]	2

2.5. Rehabilitation practice in South Africa both public and private sectors need standardization and formalized uniform rehabilitation data collecting instrument(s)

Strongly disagree	Disagree	Neutral/Not sure	Agree	Strongly agree
1	2	3	4	[✓ 5]

3. **Data collection and information Usage:**

3.1. Your institution has identified rehabilitation outcomes information needed to inform decision-making.

Strongly disagree	Disagree	Neutral/Not sure	Agree	Strongly agree
1	2	3	4	[✓ 5]

3.2. Does your institution (organisation) collect a streamlined rehabilitation data?

YES	NO
1	[✓ 2]

3.3. What are the reasons for rehabilitation data collection in your institution?

Is it for effective clinical practice?	Is it for evidence-based practice and decision-making?	Is it for both 1 and 2
1	2	[✓ 3]

3.4. In your institution, is there a system (electronic or handwritten documents) that rehabilitation outcomes data is collected, collated and stored?

YES	NO
[✓ 1]	2

3.5. If your answer in 3.4. is YES (1); What kind (type) of data aspects are reported by your system?

Is it reporting demographic data only (age, name, diagnosis, residential details)?	Is it reporting the number of rehabilitation patients that have been serviced in a day or in a month's period?	Is it reporting the level of functional activity limitation scores from admission assessments of the patient and compering scores at discharge?	Is your data collecting system reports both 1 and 2?	Is your data collecting system reports all 1, 2 and 3
1	2	3	4	[✓ 5]

3.6. Your institution assesses rehabilitation outcomes data use as it assesses routine health information system performance.

Strongly disagree	Disagree	Have no idea	Agree	Strongly agree
1	2	3	4	[✓ 5]

3.7. Does your institution need a tool that assess barriers to data use?

YES	NO
1	[✓ 2]

4. Skills capacity required to monitor and evaluate the collection of rehabilitation outcomes data:

4.1. Your institution needs capacity to collect, analyse and use data?

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	2	[✓ 3]	4	5

4.2. Has your institution provided resources such as financial support to conduct workshops, on site trainings events, short courses on how to use rehabilitation outcome data collection measuring instruments?

YES	NO
[✓ 1]	2

4.3. If your answer in 4.2. is YES (1), please provide the name of the rehabilitation outcome data collection measuring instrument that you have been trained on.

____

Fim

4.4. Does your institution have monitoring and evaluation champions that are tasked to ensure that rehabilitation outcomes data is collected and reported?

YES	NO
[✓ 1]	2

4.5. Has your institution developed leadership capacity for data demand and use?

YES	NO
[✓ 1]	2

4.6. Your institution needs departmental monitoring and evaluation champions to enhance rehabilitation outcomes data collection?

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	2	[✓ 3]	4	5

4.7. Are there any challenges that you encounter, that prevents you from collecting rehabilitation outcomes data?

YES	NO
1	[✓ 2]

5. Accessibility, availability and promotion of data use in the organisation:

5.1. Has your institution used case studies, visualize gaps and analyse data from your institution for rehabilitation outcomes and other health programme improvement?

YES	NO
1	[✓ 2]

5.2. Has your institution used information MAP (mapping) to strengthen multidirectional data feedback mechanisms?

YES	NO
1	[✓ 2]

5.3. Does your institution have procedures and policies outlining guidelines for rehabilitation outcomes data review meetings, to assess and improve performance?

YES	NO
[✓ 1]	2

5.4. Has your institution collaborated data documentation with other public, private institutions in the province or other provinces, to share lessons using case studies or rehabilitation programmes outcomes targeting? (Example: Associate awards across provinces and public-private partnerships)

YES	NO
1	[✓ 2]

6. **<u>Clinical awareness/knowledge and use of rehabilitation outcomes measuring instruments:</u>**

Below are the most commonly clinically used rehabilitation outcome measures for Functional Activity Measure (measure for activity limitation or disability) that can be used to assess rehabilitation outcomes scores progress, from patient's admission to discharge from the institution (rehabilitation hospital).

6.1. Please indicate the rehabilitation outcome measure instrument that you know with a YES (1) or NO (2).

Functional Independence Measure (FIM)	
YES	NO
[✓ 1]	2
Barthel Index (BI)	
YES	NO
[✓ 1]	~~2~~
Frenchay Activity Index (FAI)	
YES	NO
1	[✓ 2]
Modified Rankin Scale	
YES	NO
[✓ 1]	2
Nottingham Extended Activity of Daily Living Scale	
YES	NO
1	[✓ 2]

6.2. Please indicate the rehabilitation outcome instrument measure that you have used with a YES (1) or NO (2).

Functional Independence Measure (FIM)	
YES	NO
[✓ 1]	2
Barthel Index (BI)	
YES	NO
1	[✓ 2]
Frenchay Activity Index (FAI)	
YES	NO
1	[✓ 2]
Modified Rankin Scale	
YES	NO
[✓ 1]	2
Nottingham Extended Activity of Daily Living Scale	
YES	NO
1	[✓ 2]

6.3. Where did you learn about the rehabilitation outcome measure data collecting instrument (s) that you have chosen above?

Journal article	1
Internet	[✓ 2]
Training workshop	3
Varsity undergrad curriculum	[✓ 4]
Varsity postgrad curriculum	5
Peer learning/ from work colleagues	6

---------------THE- END ---------------

APPENDIX C – Request Letter for Permission to Conduct a Research Study

University of the Witwatersrand,

Wits School Of Governance

2 St David's place & St Andrews Rd,

Parktown,

Johannesburg

2193

Wits University

2022-02-16

Hospital Manager

[redacted]

PO Box 67372,

Bryanston

2021

Dear Sir/Madam,

Re: Permission to conduct research at [redacted]

My name is Mnqobi Basil Buthelezi I am a qualified Physiotherapist. I am studying for a Master of Management (specializing in Monitoring and Evaluation) in the School of Governance at the University of the Witwatersrand. I am seeking permission to do research at [redacted]

[redacted] Hospital. I have identified [redacted] for my survey study because of its comprehensive structure that suits my research inclusion criteria.

Research topic: **"Rehabilitation outcomes measurement instruments usage in KwaZulu-Natal and Gauteng healthcare".**

I am conducting research to establish the awareness and use of rehabilitation outcome measures evaluation instruments (e.g., FIM/FAM or Barthel Index scores) variations between public and private hospitals in urban and rural hospitals, by the multidisciplinary rehabilitation teams. The study is the first in my research series to compare the monitoring and evaluation of rehabilitation outcome measures data instruments awareness and usage across diverse settings. It further explores capacity opportunities or constraints across two of South Africa's healthcare settings that are public and private. Why measuring rehabilitation outcomes matters? "If you cannot measure it, you cannot prove it". The intention of this research is to influence a culture of robust data collection, collation, and analysis. Decisions made through evidence-based decision-making have a potential to influence resource allocations in the healthcare of South Africa.

Some of the few challenges expressed by the Framework and Strategy for Disability and Rehabilitation Services in South Africa 2015-2020 report (2015); firstly, the scarcity of appropriate rehabilitation indicators, secondly, the lack of national or provincial rehabilitation data sets evidence. This has led to poor evidence that evaluates the effectiveness of rehabilitation outcomes services to motivate for resources. Thirdly and overall research gap focus is the lack of research associated with rehabilitation outcomes services at all levels of public healthcare.

The research will entail collecting data from the staff members. I am inviting individuals from your hospital to participate in this study. The group of participants is composed of the medical doctor, nurse, clinical psychologist, occupational therapist(s), speech and or audio therapist(s), physiotherapist(s), and the social worker(s) functioning as a rehabilitation multidisciplinary team. If they agree, they will be asked to complete a once of data questionnaire. The questionnaire will take between 15 to 20 minutes to complete, data collection will take place at Riverfield Lodge during work hours. Participant's responses will be handwritten only.

By filling the questionnaire, the participant will be consenting to take part in the research study, this will prevent the potential identifier through signature in the consent form and uphold anonymity. Their responses will be treated confidentially, and identities (their names and the name of the organization) will be anonymous unless otherwise expressly indicated. Individual and organizational privacy will be maintained in all published and written data resulting from the study.

The results outcomes of my study will be communicated to National Department of Health (DOH) and all stakeholders involved in the research through the dissertation copy sent to the hospital. Presentation of results at the institution or conferences is possible on request by the institution. The researcher plans to publish the study in academic journals.

The research participants will not be advantaged or disadvantaged in any way. They will be reassured that they can withdraw their permission at any time during this project without any penalty. There are no foreseeable risks in participating in this study. The participants will not be paid for this study.

All research data will be preserved anonymously for reuse by other researchers for future academic studies.

I, therefore, request permission in writing to conduct my research at your hospital. The permission letter should be on your hospital's headed paper, signed and dated, and specifically referring to myself by name (Mnqobi Basil Buthelezi) and the title of my study.

Please let me know if you require any further information. I look forward to your response as soon as is convenient.

Yours sincerely,

Mnqobi Basil Buthelezi

0727464963

2011325@students.wits.ac.za

Research Supervisor

Dr. Caitlin Blaser Mapitsa

0117173692

Caitlin.mapitsa@wits.ac.za

APPENDIX D – **Study Information Document**

UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG

Name of master's student researcher: Mnqobi Basil Buthelezi

Name of Research Supervisor: Dr Caitlin Blaser Mapitsa

Institution: University of Witwatersrand, Wits School of Governance

Title of project: Rehabilitation outcomes measurement instruments usage in KwaZulu-Natal and Gauteng healthcare

Good day,

My name is Mnqobi Basil Buthelezi, a Masters student at Witwatersrand University, Johannesburg. As part of my studies, I have to undertake a research project, and I'm aiming to evaluate rehabilitation outcomes measuring data instruments usage across rural KwaZulu-Natal and urban Gauteng public and private healthcare facilities, under the supervision of Dr Caitlin Blaser Mapitsa. The aim of this research is to find out the monitoring and evaluation awareness, use of rehabilitation outcome data measuring instruments, the available capacity, opportunities of learning and constraints that exist across different settings in public and private rehabilitation healthcare in KwaZulu Natal and Gauteng.

As part of this project, I would like to invite you to take part in a survey questionnaire. This activity will involve answering questions by circling answers that are relevant to your choices, and it will take between15 to 20 minutes. This will be a once-off survey. The questionnaire will be hand-delivered on the research site and hand collected by the principal researcher. By filling the questionnaire, which is self-administered the participant will be consenting to take part in the research study, this will prevent the potential identifier through name and signature in the consent form and this will uphold anonymity. Therefore, there is no need for a consent form in this study.

There will be no personal costs to you if you participate in this project. You will not receive any direct benefits from participation but there are no disadvantages or penalties if you do not choose to participate or if you withdraw from the study. You may withdraw at any time or not answer any question if you do not want to. The questionnaire instrument will be completely confidential and anonymous as I will not be asking for your name or any identifying information, and the information you give to me will be held securely and not disclosed to anyone else.

If you have any questions during or afterwards about this research, feel free to contact me on the details listed below. This study will be written up as a research report which will be available online through the university library website. If you wish to receive a summary of this report, I will be happy to send it to you. All data collected during the study will be securely retained for two (2) years if a scientific publication arises from the study and six (6) years if there is no publication. Thereafter it will be destroyed accordingly. With your permission the data collected from this research project may be used by other researchers. If you have any concern over the way the study is being conducted, please contact the Chairperson of this Committee who is Professor Clement Penny, who may be contacted on telephone number 011 717 2301, or by e-mail on Clement.Penny@wits.ac.za. The telephone numbers for the Committee secretariat are 011 717 2700/1234 and the e-mail addresses are Zanele.Ndlovu@wits.ac.za and Rhulani.Mukansi@wits.ac.za

Yours sincerely,

Mnqobi Basil Buthelezi

Researcher:

Mnqobi Basil Buthelezi, Email:2011325@students.wits.ac.za ,Cellphone: 0727464963

Supervisor:

Dr Caitlin Blaser Mapitsa, Email:Caitlin.Mapitsa@wits.ac.za ,Phone no: 0117173692

APPENDIX E – Signatures of the Applicant, the Supervisor and WSG Research Coordinator HOD

Signatures:

Date: 11 August 2021 Applicant's Signature:

WHO WILL SUPERVISE THE PROJECT? (Where applicable)

Name Dr. Caitlin Blaser Mapitsa Department: School of Governance

Telephone No: Email: caitlin.mapitsa@wits.ac.za

Signature: CBMapitsa Date: 10 August, 2021

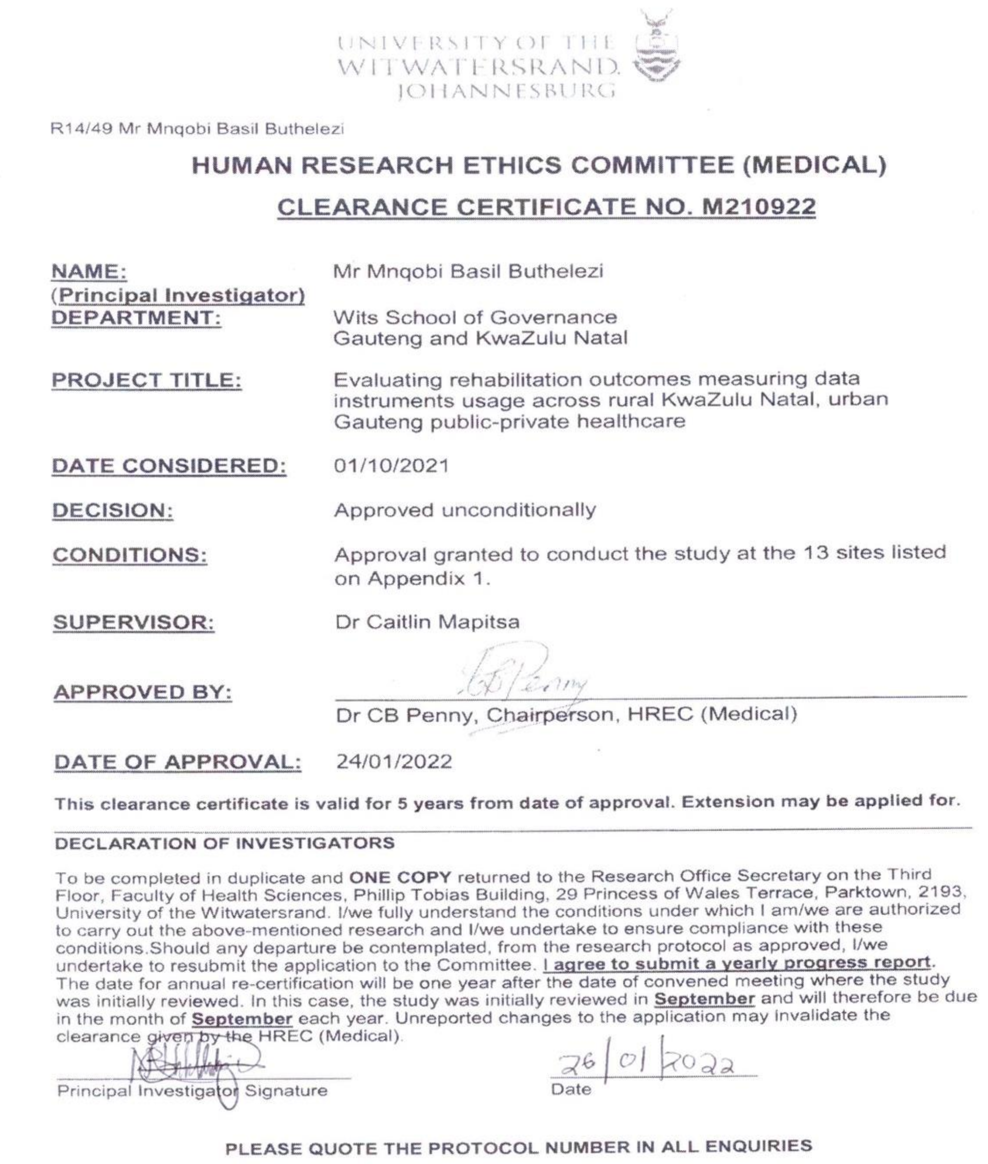
HEAD / RESEARCH COORDINATOR OF DEPARTMENT / ENTITY IN WHICH STUDY WILL BE CONDUCTED (Where applicable) (Wits Students Academic HOD must sign)

Name: Prof. Pundy Pillay Department / Entity School of Governance

Tel No: 083 643 1100 Email: pundy.pillay@wits.ac.za

Signature: PNPillay Date: 11 August 2021

APPENDIX F – Wits Human Ethics Clearance Certificate



UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG

R14/49 Mr Mnqobi Basil Buthelezi

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M210922

NAME: **(Principal Investigator)**	Mr Mnqobi Basil Buthelezi
DEPARTMENT:	Wits School of Governance Gauteng and KwaZulu Natal
PROJECT TITLE:	Evaluating rehabilitation outcomes measuring data instruments usage across rural KwaZulu Natal, urban Gauteng public-private healthcare
DATE CONSIDERED:	01/10/2021
DECISION:	Approved unconditionally
CONDITIONS:	Approval granted to conduct the study at the 13 sites listed on Appendix 1.
SUPERVISOR:	Dr Caitlin Mapitsa
APPROVED BY:	Dr CB Penny, Chairperson, HREC (Medical)
DATE OF APPROVAL:	24/01/2022

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

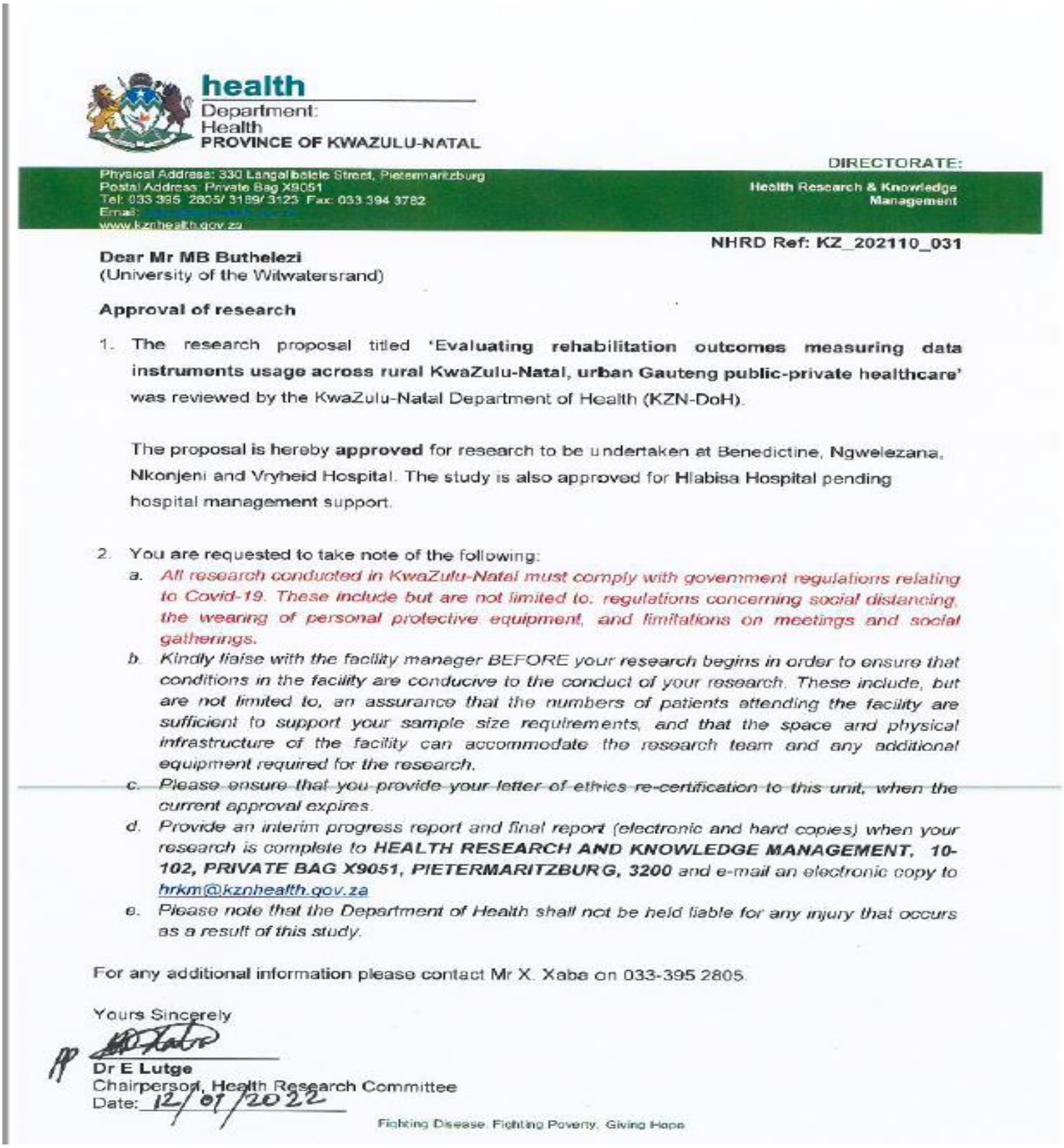
To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary on the Third Floor, Faculty of Health Sciences, Phillip Tobias Building, 29 Princess of Wales Terrace, Parktown, 2193, University of the Witwatersrand. I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions.Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to submit a yearly progress report**. The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. In this case, the study was initially reviewed in **September** and will therefore be due in the month of **September** each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature

26/01/2022
Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

APPENDIX G – NHRD Clearance, GP_202110_057 & KZN_202110_031



health
Department:
Health
PROVINCE OF KWAZULU-NATAL

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Tel: 033 395 2805/ 3189/ 3123 Fax: 033 394 3782
Email: [illegible]
www.kznhealth.gov.za

DIRECTORATE:
Health Research & Knowledge Management

NHRD Ref: KZ_202110_031

Dear Mr MB Buthelezi
(University of the Witwatersrand)

Approval of research

1. The research proposal titled '**Evaluating rehabilitation outcomes measuring data instruments usage across rural KwaZulu-Natal, urban Gauteng public-private healthcare'** was reviewed by the KwaZulu-Natal Department of Health (KZN-DoH).

   The proposal is hereby **approved** for research to be undertaken at Benedictine, Ngwelezana, Nkonjeni and Vryheid Hospital. The study is also approved for Hlabisa Hospital pending hospital management support.

2. You are requested to take note of the following:
   a. *All research conducted in KwaZulu-Natal must comply with government regulations relating to Covid-19. These include but are not limited to: regulations concerning social distancing, the wearing of personal protective equipment, and limitations on meetings and social gatherings.*
   b. *Kindly liaise with the facility manager BEFORE your research begins in order to ensure that conditions in the facility are conducive to the conduct of your research. These include, but are not limited to, an assurance that the numbers of patients attending the facility are sufficient to support your sample size requirements, and that the space and physical infrastructure of the facility can accommodate the research team and any additional equipment required for the research.*
   c. *Please ensure that you provide your letter of ethics re-certification to this unit, when the current approval expires.*
   d. *Provide an interim progress report and final report (electronic and hard copies) when your research is complete to* ***HEALTH RESEARCH AND KNOWLEDGE MANAGEMENT, 10-102, PRIVATE BAG X9051, PIETERMARITZBURG, 3200*** *and e-mail an electronic copy to* *hrkm@kznhealth.gov.za*
   e. *Please note that the Department of Health shall not be held liable for any injury that occurs as a result of this study.*

For any additional information please contact Mr X. Xaba on 033-395 2805.

Yours Sincerely

Dr E Lutge
Chairperson, Health Research Committee
Date: 12/01/2022

Fighting Disease, Fighting Poverty, Giving Hope