





Health status and disability in persons with spinal cord injuries in South Africa and Kenya

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Background: There is a lack of understanding regarding the nature of disabilities and functioning limitations associated with spinal cord injuries (SCI) in developing economies given limited healthcare resources.

Aim: Our purpose was to assess and compare SCI-related disability among individuals with SCI in South Africa and Kenya to inform rehabilitation service planning.

Settings: Two hundred individuals from South Africa and 90 from Kenya with SCI took part in this cross-sectional survey study, examining the comprehensive functioning of individuals with long-term SCI.

Methods: This study utilised the International SCI (InSCI) Community Survey questionnaire. Subsections of the questionnaire were used to investigate the differences in the period-prevalence of secondary medical conditions, activity limitations and participation restrictions in persons with SCI.

Results: In both countries, sexual dysfunction (55% – 57%), pain (48% – 49%), spasticity (41% – 42%) and bladder dysfunction (27% – 60%) emerged as the predominant secondary medical complications, with sexual dysfunction and pain showing overlap. There was no notable superiority in terms of treatment rates for secondary medical conditions between countries; however, exceptions were found. Both countries experienced similar overlaps in prevalent activity limitations and participation restrictions, including standing unsupported, using the toilet, bladder and bowel impairments, using public transport and reaching destinations. However, the Kenyan cohort showed significantly higher prevalence rates compared to the South African cohort for challenges related to carrying out daily routines, getting to destinations and using public transportation, while maintaining intimate relationships was more prevalent in South Africa.

Conclusion: This study provides insight into the similarities and differences in both the nature and prevalence of disability in two developing economies. It appears that universal functioning patterns after SCI exist in the two countries, and a further need emerged to examine these functioning problems on other major life areas.

Contribution: While some functioning problems could be addressed through healthcare and rehabilitation alone, others will require improved coordination and a whole-of-government approach, namely issues related to participation, community integration and inclusion.

Keywords: Kenya; SCI; South Africa; disability; functioning.

Introduction

Spinal cord injuries (SCI) almost always result in longstanding disability, and, if left untreated or sub-optimally managed, it may compromise quality of life and lead to social exclusion (Geyh et al. 2013; Joseph et al. 2016). The mechanism by which an SCI causes disability is through motor-sensory loss and autonomic dysfunction. The latter symptomatology sets in motion a cascade of physiological responses, resulting in disability, which according to the International Classification of Functioning, Disability and Health (ICF), denotes the negative aspects of the interaction between a person's health condition and an individual's contextual factors (personal and environmental), and manifest in terms of impairments, activity limitations and participation restrictions (Cieza et al. 2010; Ehrmann et al. 2020). Using the ICF as a conceptual model, disability is thus viewed from a biopsychosocial perspective, acknowledging the nexus between the health condition (medical model) and environment (social model) in which the individual functions (World Health Organization 2001).

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Worldwide scientific reports are emerging on disability and functioning following SCI. What is evident is the high degree of secondary medical conditions (SMC), such as pain, spasticity, contractures and bowel dysfunction, as well as activity limitations (e.g., washing the lower body and transferring from bed to wheelchair) and participation restrictions (using public transportation, employment) (Ehrmann et al. 2020; Post et al. 2020). The majority of reports are from high-income countries with advanced healthcare systems, leaving a knowledge gap related to the nature and severity of disabilities associated with SCIs in developing economies with limited resources for healthcare (AlHuthaifi et al. 2017; Fekete et al. 2020). Spinal cord injury is a common health condition in developing nations, such as South Africa and Kenya, because of its link to traumatic injuries, such as assaults, motor vehicle accidents and falls, communicable diseases (Pulmonary TB leading to Spine TB), as well as non-communicable diseases (e.g., cancers) (Joseph et al. 2015; Kassahun Bekele et al. 2023). As SCIs are universal, examining the disability profile associated with it remains important for service planning and health systems strengthening efforts.

Rehabilitation, as a healthcare pillar, is the primary strategy to address disability and enhance human functioning through multimodal interventions that are person-centred and collaborative, specifically targeting a person's capacity (Negrini et al. 2022). Since workforce and financial resources for rehabilitation vary from country to country, rehabilitation mandates, including its access, do differ. In South Africa, for example, rehabilitation is more readily available at secondary and tertiary level care, while it remains poorly integrated in primary healthcare, partly because of a lack of clear primary healthcare guidelines for rehabilitation as well as an insufficient workforce (Ahmat et al. 2022; Conradie, Berner & Louw 2022a). Furthermore, care continuity is negatively impacted because of non-coordination between levels of care and sub-optimal referral patterns (Louw et al. 2018, 2023). Comparatively, the healthcare system in Kenya faces similar challenges. With respect to rehabilitation, only one publicly funded SCI rehabilitation centre is available to all Kenyan citizens, allowing admission on a referral basis only (Ministry of Health 2015).

In developing health systems, rehabilitation often lacks proper integration and resources, especially concerning SCI (Chhabra, Sharma & Arora 2018). More recently, evidence is emerging on functioning problems that are amenable to rehabilitation even in those with long-term SCI and should thus be used to influence service design and delivery (Charumbira, Berner & Louw 2022; Cieza et al. 2020). Given the chronic and longstanding nature of SCI, there is a pressing need to compare the specific disabilities, or functional challenges, faced by individuals with chronic SCI. This comparison can provide valuable insights to bolster efforts in strengthening healthcare systems and facilitate the development of innovative rehabilitation models inspired by African contexts, ensuring their relevance and effectiveness within other relevant and comparable settings in Africa. Therefore, this study set out to determine the period-

prevalence of disability in terms of health status, for example secondary medical conditions, activity limitations and participation restrictions, in persons with SCI in South Africa and Kenya.

Research methods and design

Design, setting and participants

A cross-sectional survey study on comprehensive functioning of persons with chronic SCI was conducted in South Africa and Kenya during the periods January 2019 to December 2019 and June 2021 to December 2021, respectively. The population sizes of South Africa and Kenya are comparable, at 60 million and 55 million persons, respectively. Similarly, both settings have parallel healthcare systems, that is, public and private, where about 80% of the population utilises public healthcare (Muga et al. 2005). Despite the majority using public healthcare, only 50% of the resources and facilities are dedicated to it (Ngobeni, Breitenbach & Aye 2020).

South African setting

Public healthcare is generally organised across three levels, namely tertiary (academic); secondary/regional and primary care. Participants for the South African cohort were recruited from Western Cape and Gauteng provinces, each spending about R3500.00 annually per person on healthcare. The country has one specialised acute SCI hospital in Cape Town (Western Cape) and two rehabilitation centres, one in Cape Town and one in Gauteng. Unlike Kenya, South Africa provides rehabilitation at primary healthcare levels for managing chronic conditions such as SCI, although resources and staffing are insufficient to meet the growing need (Conradie et al. 2022b; Louw et al. 2023). Despite the availability of specialised units (acute and rehabilitation) access to these remain inequitable.

Kenyan setting

Public healthcare is organised into six levels, namely national referral hospitals that provide specialised care (level 6); county and sub-county hospitals providing care at the county level (level 5 and 4); primary care facilities such as health centres, dispensaries and maternity homes (level 3) and health-based community activities (level 1). The only public SCI rehabilitation facility in Kenya is the National Spinal Cord Injury Hospital (NSIH) located in Nairobi, serving the entire country's population. The centre admits patients only on a referral basis from both the private and public sectors. All participants from Kenya received care at the national specialised hospital and are from all regions in Kenya.

Participants and sampling

Participants, in both countries, were recruited from public healthcare registries of acute and inpatient rehabilitation facilities. Eligible participants needed to fulfil the following inclusion criteria: patients with a clinical diagnosis of SCI,

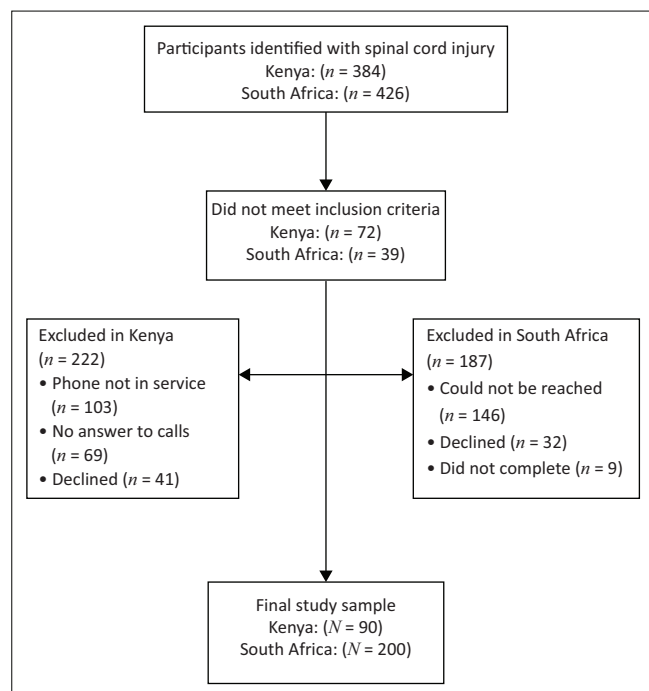


FIGURE 1: Flowchart of sampling frame, participants and non-participation.

according to international standards, on admission to the acute or rehabilitation facility; have completed acute and/or rehabilitation care; be 18 years of age or older and be a resident of either South Africa or Kenya. Individuals who were hospitalised at the time of the survey or who had severe cognitive impairments, were excluded from the study. Convenient, as opposed to random, sampling was used because of the lack of SCI-specific registries in both countries. The research assistants had access to all eligible patients who have agreed to be contacted by them following initial information provided on the purpose of the study by the attending healthcare professional. Figure 1 illustrates the source populations and sample size for each country, including reasons for non-participation.

Data collection instruments and procedure

The International SCI Community Survey (InSCI) questionnaire was used to collect data. It is a test battery that includes standardised outcome measures that can also be used at the item level to quantify functioning problems. The InSCI has been utilised in 22 nations and a series of methodological papers outlining the psychometric properties have been published (Fekete et al. 2020; Gross-Hemmi et al. 2017). The questionnaire includes 125 questions and is divided into six categories: lesion characteristics, body functions and structures, activity and participation, environmental factors, personal factors and assessment of health and wellness.

In this study we have focussed on the following categories: (1) demographic and lesion characteristics, (2) SMC and treatment rates and (3) activity and participation. The instrument was available in English as well as an acceptable Swahili translation for Kenya and Afrikaans and IsiXhosa

versions for South Africans. A rigorous translation process was followed as per the larger InSCI project protocol (Gross-Hemmi et al. 2017).

To assess functioning within the domain of impairment/secondary conditions, the *Spinal Cord Injury Secondary Condition Scale* (SCI-SCS) was utilised. This scale provides a quantification of the nature and severity of SMC as perceived by the patients themselves (Kalpakjian et al. 2007). The SCI-SCS is a valid and reliable tool that was specifically developed for self-reporting of severity of secondary conditions in SCI (Kalpakjian et al. 2007). Participants were asked to rate how much of a problem they have had with a particular complication in the last 3 months on a Likert scale of 1 (no problem) to 5 (extreme problem). Additionally, participants who stated they had an SMC were asked if they had received or were receiving treatment for it (yes or no).

The activity and participation sections were obtained from the World Health Organization Model Disability Survey (MDS), the Spinal Cord Independence Measure for Self-Report (SCIM-SR) and the SCI Functional Index (SCI-FI-AT). Eleven MDS questions were selected to cover the categories from the InSCI data model (Fekete et al. 2017). Three questions were selected from the SCI-FI AT and included in the InSCI data model. All these measures are valid and reliable in their original version (Fekete et al. 2017).

Participants were first approached via telephone by the facilities to ascertain their willingness to participate. Following this, a separate meeting was scheduled to administer the questionnaire in person or telephonically by the researchers on a date and time convenient for the participants.

The interview-administered questionnaire took about 45 min – 60 min to complete. The interviewers in this study were the primary investigators, three qualified physiotherapists and two research assistants who were informed on the background, purpose and significance of the study as well as trained on the items of the questionnaire. Before starting the interview, the participants' identity, diagnosis and year of admission at the rehabilitation facility were ascertained to establish verification. The interviews were held in the participants' preferred language. All ethical principles were upheld throughout the research process and verbal, via verbatim recording and written informed consent was secured prior to the start of data collection.

Data management and analysis

Statistical Package for the Social Sciences (SPSS) version 28.0 was used for analyses. Demographic and injury-related information was summarised using descriptive statistics. Originally, items on the SMC were rated on a Likert scale from 1 (no problem) to 5 (extreme problem). These were re-categorised into 'not existing or insignificant problem' (rated 1–2) and 'an existing or severe problem' (rated 3–5). For activity limitations, any need for partial or total assistance

in performing activities of daily living (ADLs) was deemed as a limitation. Participation restriction components were initially rated on a Likert scale from 1 (no problem) to 5 (extreme problem), but later re-categorised into 'not existing or insignificant problem' (rated 1–2) and 'an existing or severe problem' (rated 3–5). Inferential statistics, specifically Chi-square (measures of association), were used for differences in the period-prevalence of SMC, activity limitations and participation restrictions between South Africa and Kenya. A p -value < 0.05 was seen as significant.

Ethical considerations

This study was approved by the Human Research Ethics Committee of Stellenbosch University (S20/11/312) and the Biomedical Research Ethics Committee of the University of the Western Cape (BM16/3/24). Both modes of informed consent, that is, verbal (recorded) and written, were used, depending on the participants' preference for data collection, which was either face-to-face or telephonic

interview administration of the questionnaire. Anonymity was assured by assigning unique identity codes to each participant with identifiable information saved in a password protected file. Participants were informed of their right to withdraw at any time, without repercussions, preserving their autonomy. The multilayered ethical approval approach aided in ensuring the study was conducted according to the highest ethical standards. Data illustration in this article was performed at the group level.

Results

Socio-demographic and injury characteristics of cohorts

There were no differences in the sex distribution ($p = 0.763$) and current mean age ($p = 0.564$) between the cohorts (Table 1). Significant differences were noticed in the age distribution ($p = 0.003$), with a higher prevalence of SCI in older individuals (≥ 46 years) in the South African cohort. Marital status also showed a significant difference, with more

TABLE 1: Socio-demographic and injury characteristics of participants.

Variable	South Africa (N = 200)				Kenya (N = 90)				P
	n	%	Mean	s.d.	n	%	Mean	s.d.	
Sex									
Male	150	75.0	-	-	66	73.0	-	-	0.763
Female	50	25.0	-	-	24	27.0	-	-	-
Current age	-	-	38.4	12.6	-	-	37.10	9.68	0.564
Age categories									0.003
16–30 years	70	35.0	-	-	21	23.3	-	-	-
31–45 years	71	35.5	-	-	50	55.6	-	-	-
46–60 years	47	23.5	-	-	19	21.1	-	-	-
61 years	12	6.0	-	-	0	0.0	-	-	-
Age at injury	-	-	28.0	11.0	-	-	32.04	9.60	< 0.005
Marital status†									< 0.001
Single	133	66.5	-	-	38	42.2	-	-	-
Married/partnership	44	22.0	-	-	38	42.2	-	-	-
Separated/divorced	22	11.0	-	-	14	15.6	-	-	-
Aetiology									< 0.001
Traumatic	70	35.0	-	-	50	55.6	-	-	-
Road traffic accident	0	0.0	-	-	30	33.3	-	-	-
Falls	81	40.5	-	-	8	8.9	-	-	-
Violence	34	17.0	-	-	1	1.1	-	-	-
Sports	15	7.5	-	-	1	1.1	-	-	-
Non-traumatic	-	-	-	-	-	-	-	-	-
Level of injury‡									< 0.001
Paraplegia	119	60.7	-	-	81	90.0	-	-	-
Tetraplegia	77	39.3	-	-	9	10.0	-	-	-
Severity of injury‡									0.020
Complete	102	52.0	-	-	60	66.7	-	-	-
Incomplete	94	48.0	-	-	30	33.3	-	-	-
ADL assistance									0.850
Yes	149	74.5	-	-	68	75.6	-	-	-
No	51	25.5	-	-	22	24.4	-	-	-
Education level									< 0.001
Primary	17	8.5	-	-	20	22.2	-	-	-
Secondary (low and high)	136	68.0	-	-	34	37.8	-	-	-
Post secondary	28	14.0	-	-	18	20.0	-	-	-
Tertiary (short, graduated)	19	9.5	-	-	18	20.0	-	-	-

Source: Adapted from Joseph, C., Lijodi, B. & Titus A., 2023, *Health status and disability in persons with spinal cord injuries: A comparison between South African and Kenyan cohorts*, World Physiotherapy Congress, Dubai, June 02–04, 2023, viewed n.d., from <https://world.physio/congress-proceeding/health-status-and-disability-persons-spinal-cord-injury-comparison-between-0>

Note: Bold font indicate a significant finding at $p < 0.05$.

s.d., standard deviation; ADL, activities of daily living.

†, $n = 199$; ‡, $n = 196$.

single individuals in the South African group ($p < 0.001$). Educational categories exhibited a significant difference ($p < 0.001$) between cohorts. Furthermore, injury characteristics, including aetiology ($p < 0.001$), level ($p < 0.001$) and severity of injury ($p = 0.02$), varied significantly between cohorts, with more instances of paraplegia and complete injuries in the Kenyan cohort compared to the South African cohort (Table 1). Participation rates for South Africa and Kenya were 47% and 29%, respectively.

Secondary medical conditions and their treatment rates between countries

Table 2 illustrates disparities in the prevalence of SMC and their treatment rates between the two countries. In the Kenyan cohort, bladder dysfunction, sexual dysfunction and pain were the most prevalent SMC, whereas sexual dysfunction, spasticity and pain were predominant in the South African cohort, with two out of three complications overlapping between cohorts.

Significant differences in period-prevalence were observed for sleeping problems (17% vs. 38%, $p < 0.001$) and autonomic dysreflexia (9% vs. 21%, $p = 0.014$), with higher occurrences in the South African cohort compared to the Kenyan cohort. Conversely, bowel problems (47% vs. 29%, $p = 0.004$) and

bladder dysfunction (60% vs. 27%, $p < 0.001$) were more prevalent in the Kenyan cohort compared to the South African cohort.

In the Kenyan cohort, the SMC with the highest treatment rates were decubitis, injury because of sensation loss, and pain, all reaching 100%. In contrast, the most treated SMC in the South African cohort were bowel problems (71%), decubitis (71%), and urinary problems (58%). Statistically better treatment rates were observed for bowel problems ($p = 0.005$) in the South African cohort. Conversely, contractures ($p < 0.001$), decubitis ($p = 0.007$), respiratory complications ($p = 0.003$) and pain ($p < 0.001$) were significantly more treated in the Kenyan cohort.

Prevalence of activity limitations and participation restrictions between countries

The three leading activity limitations in the Kenyan and South African cohorts were standing unsupported, using the toilet and bladder and bowel impairment (Table 3). A significant difference in the period-prevalence of items related to using the toilet ($p < 0.001$) and sitting unsupported ($p < 0.001$) was found with the former being more prevalent in the Kenyan cohort and the latter more prevalent in the South African cohort.

TABLE 2: Difference in period-prevalence of secondary medical conditions and their treatment rates between countries.

Variable	South Africa (N = 200)				Kenya (N = 90)				P
	n	%	Mean	s.d.	n	%	Mean	s.d.	
Sleep problems, Yes	75	38	-	-	15	17	-	-	< 0.001
Treatment – sleep problems Yes	40	53	-	-	4	27	-	-	0.059
Bowel problems, Yes	58	29	-	-	42	47	-	-	0.004
Treatment – bowel problems Yes	41	71	-	-	18	43	-	-	0.005
Urinary problems, Yes	57	29	-	-	31	34	-	-	0.321
Treatment – urinary problems, Yes	33	58	-	-	19	61	-	-	0.757
Bladder dysfunction, Yes	53	27	-	-	54	60	-	-	< 0.001
Treatment – bladder dysfunction, Yes	25	47	-	-	27	50	-	-	0.770
Sexual dysfunction, Yes	110	55	-	-	51	57	-	-	0.860
Treatment – sexual dysfunction, Yes	16	15	-	-	5	10	-	-	0.406
Contractures, Yes	74	37	-	-	41	46	-	-	0.168
Treatment – contractures Yes	21	30	-	-	25	61	-	-	< 0.001
Spasticity, Yes	104	52	-	-	37	41	-	-	0.086
Treatment – spasticity, Yes	52	50	-	-	20	54	-	-	0.672
Decubitis, Yes	35	18	-	-	21	23	-	-	0.244
Treatment – decubitis, Yes	25	71	-	-	21	100	-	-	0.007
Respiratory complications, Yes	28	14	-	-	12	13	-	-	0.880
Treatment – respiratory complications, Yes	7	25	-	-	9	75	-	-	0.003
Injury because of sensation loss, Yes	19	10	-	-	3	3	-	-	0.067
Treatment – sensation loss, Yes	5	26	-	-	3	100	-	-	0.300
Circulation problems, Yes	55	28	-	-	18	20	-	-	0.173
Treatment – sensation loss, Yes	15	27	-	-	7	39	-	-	0.351
Dysreflexia, Yes	41	21	-	-	8	9	-	-	0.014
Treatment – dysreflexia, Yes	16	39	-	-	3	38	-	-	0.935
Hypotension, Yes	39	20	-	-	11	12	-	-	0.125
Treatment – hypotension, Yes	7	18	-	-	3	27	-	-	0.495
Pain, Yes	98	49	-	-	43	48	-	-	0.847
Treatment – pain, Yes	38	39	-	-	43	100	-	-	< 0.001
Pain intensity (0–10)	-	-	3.07	2.56	-	-	3.6	3.07	0.120

Source: Adapted from Joseph, C., Lijodi, B. & Titus A., 2023, *Health status and disability in persons with spinal cord injuries: A comparison between South African and Kenyan cohorts*, World Physiotherapy Congress, Dubai, June 02–04, 2023, viewed n.d., from <https://world.physio/congress-proceeding/health-status-and-disability-persons-spinal-cord-injury-comparison-between-0>

Note: Bold font indicate a significant finding at $p < 0.05$.

s.d., standard deviation.

TABLE 3: Prevalence of activity limitations and participation restrictions in respective cohorts.

Functioning items	South Africa (N = 200)		Kenya (N = 90)		P
	n	%	n	%	
Participation categories					
Carrying out daily routine, problem	57	29	47	52	< 0.001
Handling stress, problem	79	40	27	30	0.120
Doing things with hands/fingers, problem	81	41	11	12	< 0.001
Getting to your destination, problem	90	45	68	76	< 0.001
Using public transportation, problem	125	63	81	90	< 0.001
Using private transportation, problem	80	40	46	51	0.077
Looking after your health, problem	47	24	20	22	0.081
Doing housework, problem	79	40	37	41	0.790
Providing care and support, problem	69	35	24	27	0.186
Interacting with people, problem	28	14	16	18	0.407
Maintaining intimate relationships, problem	86	43	19	21	< 0.001
Doing things for relaxation/pleasure, problem	61	31	17	19	0.037
SOB during physical exertion, problem	49	25	10	11	0.009
Activity categories					
Sitting unsupported, able	132	66	81	90	< 0.001
Standing unsupported, able	44	22	15	17	0.297
Eating and drinking, assistance required	60	30	17	19	0.053
Washing upper body and head, assistance required	56	28	28	31	0.600
Washing lower body, assistance required	62	31	35	39	0.188
Dressing upper body, assistance required	69	35	25	28	0.258
Dressing lower body, assistance required	80	40	31	34	0.404
Grooming, assistance required	52	26	28	31	0.368
Bowel impairment, assistance required	96	48	38	42	0.305
Using the toilet, assistance required	89	45	68	76	< 0.001
Transfer from bed to wheelchair, assistance required	76	38	30	33	0.445

Source: Adapted from Joseph, C., Lijodi, B. & Titus A., 2023, *Health status and disability in persons with spinal cord injuries: A comparison between South African and Kenyan cohorts*, World Physiotherapy Congress, Dubai, June 02–04, 2023, viewed n.d., from <https://world.physio/congress-proceeding/health-status-and-disability-persons-spinal-cord-injury-comparison-between-0>

Note: Bold font indicate a significant finding at $p < 0.05$.

SOB, shortness of breath.

In the Kenyan cohort, common participation restrictions included using public transportation, getting to your destinations and carrying out daily routines. Similarly, the South African cohort also experienced limitations in using public transportation and reaching destinations, with the addition of maintaining intimate relationships as a leading participation restriction. The South Africa cohort showed higher prevalence rates for difficulties related to using hands and/or fingers ($p < 0.001$), maintaining intimate relationships ($p < 0.001$), doing things for relaxation and/or pleasure ($p = 0.037$) and experiencing shortness of breath during physical exertion ($p = 0.009$) compared to the Kenyan cohort. Conversely, the Kenyan cohort exhibited significantly higher prevalence rates compared to the South African cohort for challenges related to carrying out daily routines ($p < 0.001$), getting to your destinations ($p < 0.001$) and using public transportation ($p < 0.001$; see Table 3).

Discussion

This study provides comparative information on health status and disabilities across the functioning domains of the ICF in two African countries (South Africa and Kenya) with the aim of identifying priority intervention targets. A diverse range, as well as high prevalence, of functioning problems including SMC, activity limitations and participation restrictions, was found for both countries. These findings point to the need for investigating the effectiveness of current

rehabilitation models and practices as well as the potential role of rehabilitation in addressing functioning problems that are amenable.

In both countries, sexual dysfunction, pain, spasticity and bladder dysfunction emerged as the leading SMCs, with sexual dysfunction and pain overlapping. Similar findings were found in a large 22-country cross-sectional survey study (Ehrmann et al. 2020). Impairments such as those found in this study do not occur in isolation but often impact other functioning domains and categories. One study found chronic pain to negatively affect quality of life and depressive states in persons with SCI (Ataoglu et al. 2013), while others found sexual dysfunction to negatively impact life satisfaction, social relationships with intimate partners and well-being (Barrett, Mattacola & Finlay 2023; Thurston et al. 2021). Recent studies, with respect to pain and sexual dysfunction management, highlight the lack of available and implementable clinical practice guidelines, unavailability of multi-disciplinary team approaches and poor coordination of services and care continuity (Mashola, Korkie & Mothabeng 2024; Thurston et al. 2021; Williams et al. 2023). We further found no country to be superior in terms of treatments provided for SMC, with a significantly greater proportion receiving treatment for some conditions in South Africa and the same goes for Kenya. While the survey items did not specify the type of treatments received for SMCs, factors such as improved awareness and

monitoring of certain complications by individuals with SCI, as well as the availability of accessible treatment options and protocols in the respective countries, may partly account for the similarities and differences observed in treatment rates.

We found a similar overlap in the most prevalent activity limitations, specifically standing unsupported, using the toilet, and bladder and bowel impairments and participation restrictions, namely using public transport and getting to your destination, between countries. The participation restrictions with respect to using public transport and getting to your destination were significantly more pronounced in the Kenyan cohort, compared with South Africa. This is likely because of poor implementation of policies and strategies to promote reasonable accommodation of the physical environment, for example, public and private sector transportation, as well as access to buildings, stadiums, stores and other social areas of civic society (Silver et al. 2012; Wehman et al. 1999). The literature further confirms the association between the degree of environmental challenges and economic participation, that is, employment and return-to-work (Bezuidenhout et al. 2023 & Bezuidenhout et al. 2022). Another significant important difference was related to maintaining intimate relationships with the occurrence being greater in the South African cohort. Firstly, this could be because fewer persons with SCI are married or in a partnership in the South African cohort compared with Kenyans. Secondly, a local South African study found complex interactions between intrinsic psychological factors, such as low sexual self-esteem and external factors such as socio-cultural norms (gender norms) to affect sex and intimacy in individuals with SCI (Thurston et al. 2021). There is a need to better understand how structural forms of relationships (i.e. single vs. married/partnership) affect intimate relationships in the South African cohort as well as the impact of the social and attitudinal environment on intimacy.

Surprisingly, this study found a high degree of similarities in the most prevalent SMCs, activity limitations and participation restrictions between cohorts, suggesting more universal patterns of functioning of persons with SCI. However, little is known about the underlying mechanisms, in terms of healthcare services, including rehabilitation provision models, implementation challenges related to rehabilitation and monitoring and evaluation efforts for rehabilitation impact assessment. The first immediate step towards advancing rehabilitation for persons with SCI in the respective countries would be to interrogate the current use of guidelines/frameworks and practices to address some of the highly prevalent functioning problems typically addressed through rehabilitation. Furthermore, these practices should be quality assessed and compared with the World Health Organization package of interventions for rehabilitation in the SCI population to decide on their context appropriateness and the need for adaptation or contextualisation. The second step should involve exploring

the impact of the most prevalent functioning problems on health-related quality of life, life satisfaction and productive activity (employment), firstly, to examine the mediating role of these functioning problems on other important life areas, and secondly, to advocate for interventions/treatments that have known efficacy and effectiveness to ameliorate functioning problems related to such major life areas. This should ideally be performed by understanding the evolution of these functioning problems longitudinally, as well as identifying factors related to their occurrence temporally and how these functioning problems relate with each other and other health systems indices such as quality of life, quality-adjusted life years, and disability-adjusted life-years. These incremental steps will help ensure generating evidence for systems change and strengthening as well as identifying important intervention points (temporal) and targets. It could further help justify the re-direction of limited resources to areas of most need for most person-oriented impact.

Although several starting points and recommendations are offered to strengthen rehabilitation on the African continent, the current study presented some limitations. Firstly, no national coverage of persons with SCI was possible in either country because of the lack of a national SCI database or active surveillance system, which greatly impacts the generalisability of the results to other provinces and regions. Secondly, a convenient, instead of random, sampling strategy was used. However, the non-response analysis when comparing those who were enrolled in the study versus those who have declined yielded supporting evidence that no difference in demographic and injury-related factors between responders and non-responders was present.

Conclusion

Disability after SCI was highly prevalent and a high degree of similarity in the top functioning problems were found in two countries with developing healthcare systems. While some functioning problems could be addressed through healthcare and rehabilitation alone, others will require improved coordination and a whole-of-government approach to ameliorate issues related to participation, community integration and inclusion. There is an immediate need to evaluate current healthcare and rehabilitation models specific for SCI in South Africa and Kenya with the potential of working together in developing cost-effective models and interventions for the African context.

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were presented at the World Physiotherapy Congress, 02–04 June 2023, Dubai (<https://world.physio/congress-proceeding/health-status-and-disability-persons-spinal-cord-injury-comparison-between-0>). It dealt with the same study and reported similar findings as presented in this article. We acknowledge this prior presentation, to maintain transparency and integrity in the reporting of our research. While the core findings remain consistent, this article includes additional data, analyses and interpretations that were not part of the original conference presentation. These additions have been made to enhance the depth and scope of the research for the purposes of publication in 'Rehabilitation Advances in Developing Health Systems'.

Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

C.J. was responsible for conceptualising the study, collecting and analysing the data, writing the first draft and preparing the final submitted version of the article. B.L. assisted in conceptualisation, assisted in data analysis and approved the final version of the article. A.T. assisted in data analysis and approved the final version of the article. L.B. assisted in data analysis and conducted extensive corrections on the first and final version of the article.

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Data availability

Data are available upon reasonable request from the corresponding author, C.J.

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