



A Comparative Study of Access to Healthcare and Health-Related Quality of Life among Adults with Disabilities during COVID-19 Pandemic in Kakamega County, Kenya

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Abstract

BACKGROUND

This study compared the health-related quality of life of adults with disabilities against a control group in Kakamega County. The effect of access to health care on health-related quality of life during COVID-19 was also assessed.

METHODOLOGY

A case-control study was undertaken with 212 persons with disabilities and a comparator group of 212 individuals. Matching between persons with and without disabilities was based on age (+ or -5 years) and sex. The World Health Organisation Quality of Life Questionnaire and WHO Module on disabilities were adopted to assess Health-related Quality of Life (HRQOL) and access to healthcare respectively. Data was analysed using descriptive and inferential statistics.

RESULTS

Persons with disabilities had significantly lower HRQOL scores compared with the control group (mean difference, 6.89 $p < 0.01$). They were also more likely to encounter barriers to healthcare access. Access to healthcare was positively associated with the HRQOL for the two groups (0.29 $p < 0.05$) but, those with disabilities who experienced limited access to healthcare had lower HRQOL (-0.09 $p < 0.038$).

CONCLUSION

Disability was associated with lower HRQOL. In both groups, access to healthcare was linked to higher HRQOL. Policies to enhance access to healthcare for persons with disabilities; subsidies on medical costs, and ensuring disability-friendly hospitals, are imperative. Awareness of the rights of persons with disabilities, and solving inequities in education and labour market access, is necessary to achieve full participation of persons with disabilities in social life.

Keywords: Healthcare, Quality of Life, Disability, COVID-19

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Introduction

Periodic exposures of people to widespread illness, death, fear, and anxiety associated with epidemics and pandemics have been reported in the past ¹. Severe Acute Respiratory Syndrome (SARS), Ebola, Swine Flu

and Middle East Respiratory Syndrome (MERS), were all associated with adverse effects on the socio-economic well-being of the world's populations ^{2,3,4}. Measures to contain such crises like physical, and social distancing, community, and society-wide restrictions disrupt people's



daily lives⁵, including access to healthcare⁶. Limited access to healthcare, especially for persons with disabilities, can compromise Health-Related Quality of Life (HRQOL)⁷.

HRQOL refers to an individual's perception of functioning and well-being concerning physical, mental and social domains⁸. It considers a person's interaction with family, friends, the society at large, and focuses on the impact of health status on Quality of Life (QoL) and how satisfied individuals are with their lives⁹. Evidence shows that physical HRQOL can be influenced by pain, sleep disturbances, and low energy, while the environmental domain is affected by access to services and recreation, transportation, and satisfaction with living space¹⁰. The social domain of HRQOL is influenced by relationship satisfaction, social support, and the presence of prejudice¹¹.

Globally, persons with disabilities encounter a variety of barriers that limit their participation in social activities. This is despite the existence of various legal frameworks (the constitution, Convention on the Rights of Persons with Disabilities and the World Program of Action on Disabilities) which advocate for the inclusion of persons with disabilities in the pursuit of optimum participation in social life including access to healthcare. Generally, they experience low education, poor health outcomes, and lack of economic, and social support-leading to higher poverty and increased dependency compared to people without disabilities¹². They are also more likely to seek healthcare due to the higher burden of comorbidities¹³. Restrictions on access to healthcare during the pandemic¹⁴, may have posed an additional challenge to people in need of regular rehabilitation services, without which their health status and consequently HRQOL may deteriorate. The COVID-19 pandemic resulted in high mortality and morbidity rates, with higher rates observed among persons with disabilities^{15,16}. Ability to pay, fear of illness, lack of social support and

infrastructural challenges are other barriers to healthcare access¹⁷.

Although studies have shown that access to healthcare is closely related to HRQOL, there is a paucity of data for persons with disabilities in Kenya, especially during pandemics such as COVID-19. This study investigated HRQOL between adults with and without disabilities and the effect of access to healthcare on HRQOL in Kakamega County. Kenya has an estimated 2.2% of disability with higher prevalence in rural areas (2.6%) compared to urban (1.4%)¹⁹. Disability prevalence in Kakamega County is estimated at 2.9 %, slightly above the national average, and physical disability is the most common (ibid).

Methodology

Study setting

Kakamega County in Kenya has an estimated population of 1,867,579 people, a population density of 618 persons per square kilometre, an average household size of 4.3, and a land area of 3, 020 Km²¹⁸. It has 13 sub-counties: Butere, Kakamega Central (Lurambi), East, North and South, Kwisero, Likuyani, Lugari, Matete, Matungu, Mumias East, West and Navakholo. The main sources of livelihood for the residents are small-scale farming and micro-enterprises.

Study design and population

A case-control design aided in incorporating adults with disabilities and a comparator group. Individuals aged 18 years and above, who self-reported as having a disability were targeted. The comparison group included people without disabilities from the neighbourhood. We controlled for confounding factors by matching the two groups using age (+or-5years) and sex.

Sample size and sampling technique

Charan and Biswas¹⁹ formula was adopted to determine sample size: $n = \left(\frac{r+1}{r}\right) \frac{SD^2(Z_\beta + Z_\alpha)^2}{d^2}$, where n = sample size of persons with disabilities, r is the ratio of persons



with disabilities to comparator group, d is the expected mean difference in the outcome of interest between persons with disabilities and controls, determined from previous studies, SD is the Standard Deviation of the expected mean difference between persons with disabilities and controls, concerning the outcome of interest, also obtained from previous studies, Z_{β} is the standard normal variate for the power, and Z_{α} is the standard normal variate for the significance level. A study from Myanmar which adopted the World Health Organisation Quality of Life (WHOQOL)-100, established $d^2=6.4$ and $SD=16.0$ on the QoL between people with and without muscular-skeletal impairments²⁰. Using these estimates, a power of 80% ($Z_{\beta}=0.84$), 95% (1.96) significance level for the two-tailed test, and $r=1:1$, a sample size of 98 per group was obtained. To permit sample disaggregation by gender, the study doubled the sample to 196 individuals per group, bringing the total to 392.

Simple random sampling was conducted to select 30 percent of the sub-counties (i.e., four): Matungu, Lurambi, Lugari and Khwisero, and 4 wards were selected randomly in each sub-county. Using member lists from Organisations of Persons with Disabilities (OPDs), 20 people were purposively selected in each ward, stratified by sex. Selection of persons with disabilities was preceded by disability assessment where individuals were asked a Shot Set of Washington Group of questions (WGSS) directly to ascertain their disability status²¹ and their age. For each eligible person with disability, one matched control was selected from the same neighbourhood with similar sex, and aged +/-5 years.

Data collection and processing

A pre-tested semi-structured questionnaire comprising socio-demographics, disability status, access to healthcare, and HRQOL items was used to collect data. WHOQOL-100²² was used to assess HRQOL. This tool has six dimensions of QoL (physical,

psychological, level of independence, social relationships, environmental and spiritual). Its scale has a positive range (1-5), with 1 indicating negative perceptions, and 5 showing the highest positive perception of QoL. Levesque, Harris and Rusell's conceptual framework was adopted to assess access to health care²³. This framework has five domains of access to healthcare (approachability, acceptability, availability, accommodation at healthcare facilities; affordability and appropriateness of the services). Using this framework, the study explored the extent to which participants' opinions on factors related to these dimensions affected their access to healthcare on a 5-point Likert scale where 1 indicated strongly disagree, and 5 showed strongly agree. The items for each dimension were extracted from the WHO module on disabilities.

Face-to-face interviews were conducted by 10 research assistants after 2 days of training. Data collection was carried out electronically via the mobile phone application (Kobocollect) during the pandemic (July 1 – August 28, 2022). COVID-19 protocols were followed during data collection: interviews conducted outdoors, physical distancing, hand washing with soap and water/use of disinfectants, and wearing masks by the research team and participants.

All analyses were completed in Stata 14^{V24}. Mean values of HRQOL and access to the healthcare domain were computed and transformed out of 100 using WHO criteria²⁵. T-statistics were calculated on socioeconomic factors and HRQOL scores for persons with disabilities and controls.

Risk Ratios (RR) were computed to compare various socioeconomic characteristics between persons with disabilities and the controls. To account for the effect of matching, a conditional logistic regression was conducted to determine the effect of access to healthcare on the HRQOL²⁶. A $p<0.05$ was considered statistically significant.



Ethical consideration

The study protocol was approved by the Kenyatta National Hospital-Nairobi University Ethics and Research Committee (KNH-UoN ERC) and the National Commission for Science, Technology, and Innovation (NACOSTI). Informed consent was sought from each participant and confidentiality of data ensured.

Results

Half of the 424 participants interviewed, were persons with disabilities (Table 1). Results show that persons with disabilities were more likely to be unmarried (33.02% versus 27.36%, RR 1.29, 95% confidence interval 1.04-1.60) or separated/divorced (15.09% versus 6.13%, RR

1.67, 95% CI 1.32–2.13) compared to the controls. Similar proportions of persons with disabilities and the control group had attended primary school, but the former were less likely to have completed secondary school ($p < 0.05$), and none had postgraduate qualifications. Persons with disabilities were more likely to be unemployed (74.06% versus 51.89%, RR 1.68, 95% CI 1.33–2.12).

Persons with disabilities had a lower overall HRQOL score compared to the controls from the same locality (Table 2, mean difference 6.9 $p < 0.01$). Similarly, persons with disabilities had lower HRQOL in the physical, social relationships, environmental and level of independence domains (all $p < 0.01$).

Table 1:
Socio-Demographic Characteristics of Study Participants

	Variable	Total n (%)	Persons with disabilities n (%)	Controls n (%)	RR (CI-95%)	P-value
	Total	424 (100%)	212 (50%)	212 (50%)		
Sex	Male	208(49.06%)	102(48.11%)	106 (50%)	0.96(0.698)	
	Female	216(50.94%)	110(51.89%)	106 (50%)	Baseline	
Age (years)	18-24	62(14.62%)	33 (15.57%)	29 (13.68%)	Baseline	
	25-34	102(24.06%)	52 (24.53%)	50 (23.58%)	0.96(0.71-1.29)	0.779
	35-49	130(30.66%)	64 (30.19%)	66 (31.13%)	0.94(0.69-1.24)	0.600
	50-64	89 (20.99%)	40 (18.87%)	49(23.11%)	0.84 (0.61-1.17)	0.312
	>65	41(9.67%)	23 (10.85%)	18 (8.49%)	1.05 (0.73-1.51)	0.773
Marital Status	Married	233 (54.95%)	99 (46.70%)	134 (63.21%)	Baseline	
	Unmarried	128 (30.19%)	70 (33.02%)	58 (27.36%)	1.29 (1.04-1.60)	<0.023
	Separated/divorced	45 (10.61%)	32 (15.09%)	13 (6.13%)	1.67 (1.32-2.13)	<0.000
	Widowed	18 (4.25%)	11 (5.19%)	7 (3.30%)	1.44 (0.97-2.14)	0.073
Education	No formal education	52(12.26%)	35 (16.51%)	17 (8.02%)	Baseline	
	Primary	148(34.91%)	81 (38.21%)	67 (31.60%)	0.81(0.64-1.03)	0.090
	Secondary	136(32.08%)	66 (31.13%)	70 (33.02%)	0.72 (0.56-0.93)	<0.012
	Certificate	38 (8.96%)	17 (8.02%)	21(9.91%)	0.66(0.45-0.99)	<0.046
	Diploma	29 (6.84%)	11 (5.19%)	18 (8.49%)	0.56 (0.34-0.93)	<0.025
	Degree	19 (4.48%)	2 (0.94%)	17 (8.02%)	0.16(0.04-0.59)	<0.006
Employment	Post-graduate	2 (0.47%)	0 (0%)	2 (0.94%)	-	
	Employed	157 (37.03%)	55 (25.94%)	102 (48.11%)	Baseline	
	Unemployed	267 (62.97%)	157 (74.06%)	110 (51.89%)	1.68(1.33-2.12)	<0.000
Disability type	Physical	77 (36.32%)				
	Vision	35 (16.51%)				
	Hearing	25 (11.79%)				
	Cognitive	15 (7.08%)				
	Self-care	11 (5.19%)				
	Communication	28 (13.21%)				
	Multiple	21 (9.91%)				

Note: RR for post-graduate was omitted since no person with a disability had this qualification



The highest mean differences were observed in environmental (14.8, $p < 0.01$), independence (11.8, $p < 0.01$) and physical (8.0, $p < 0.01$) domains. No differences were observed concerning the psychological and spiritual domains.

Quality of Life and socio-demographic characteristics of persons with disabilities

Table 3 presents mean differences and confidence intervals (CI) of the covariates of the HRQOL. Overall, among persons with disabilities, being young is associated with lower HRQOL (mean difference -11.66, 95% CI (-25.39-2.07)). Higher overall HRQOL was associated with post-primary education, employment and income with mean differences of 10.89, 28.12 and 23.79 respectively. Being young was also related to lower HRQOL in the

social relations (-3.60, 95% CI -7.76-0.55) and spirituality/religion (-8.8, 95% CI -14.87-(-2.73)) domains. The employed are more likely to have higher social-relation-related QoL (6.53, 95% CI 1.94-11.13), Independence (6.67, 95% CI 1.0-1.74), environment (5.35, 95% CI 0.38-10.33), and spiritual well-being (9.14, 95% CI 2.33-15.94). Similarly, higher income was associated with higher physical (3.64, 95% CI (-0.08-7.83) and spiritual-related QoL (14.51, 95% CI 8.75-20.27).

Results on access to healthcare (Table 4), indicate that persons with disabilities had overall low access to healthcare as compared to the controls, and lower scores for each of the five sub-domains (Mean difference across domains -9.93 $p < 0.01$). The greatest difference in access to healthcare between persons with disabilities and the controls was in acceptability (-16.48 $p < 0.01$) followed by affordability (-9.9, $p < 0.01$).

Table 2:

HRQOL, Transformed Scores (Mean, SD, Confidence intervals, and p-values

WHOQOL-100 domains	Persons with disabilities			Controls			P-value
	Mean	Std. Dev.	Mean	Std. Dev.	Mean Difference	CI (95%)	
Physical	23.41	13.85	31.43	13.81	8.02	5.38-10.66	<0.01
Psychological	49.23	12.86	49.82	17.22	0.59	-2.31-3.49	0.3449
Social relations	20.05	13.37	23.85	15.11	3.80	1.08-6.53	<0.05
Environmental	50.35	19.17	65.18	16.24	14.83	11.44-18.22	<0.01
Level of independence	28.92	15.77	40.74	16.63	11.82	8.73-14.92	<0.01
Spiritual/religious	34.14	15.68	36.41	22.34	2.27	-1.41-5.95	0.1133
Mean WHOQOL-Bref	34.35	15.12	41.24	16.89	6.89	32.33-50.33	<0.01

Mean domain score ≤ 45 , low QoL; score 46 to 65, moderate QoL; and score > 65 , relatively high QoL (Bani-Issa, 2011). Reference category (Controls)

Table 3:

HRQOL Domains and Socioeconomic characteristics among persons with disabilities (Mean differences)

HRQOL domains	Age(young=1	Employed=1	Post primary=1	Income (higher=1)
Overall HRQOL	-11.66(-25.39-0.07)**	28.12(13.14-3.11)***	10.89([-2.91]-24.70)**	23.79(10.57-37.00)**
Physical	-1.18(-5.01-2.64)	0.46([-3.81]-4.74)	-0.64([-4.47]-3.20)	3.64([-0.081]-7.38)**
Psychological	-0.67([-5.43]-4.10)	-0.04([-5.37]-5.29)	2.45([-2.32]-7.22)	-0.012([-4.70]-4.68)
Social relations	-3.60 ([-7.76]-0.55)**	6.53(1.94-11.13)**	0.15([-4.05]-4.35)	3.43([-0.66]-7.52)
Independence	2.37([-2.22]-6.97)	6.67(1.60-11.74)**	4.83 (0.26-9.41)**	1.32([-3.20]-5.85)
Environment	0.22([-4.28]-4.72)	5.35(0.38-10.33)**	0.95 ([-3.56]-5.47)	0.89([-3.53]-5.32)
Spiritual	8.8([-14.87]-[-.73])**	9.14(2.33-15.94)**	3.14([-3.056]-9.33)	14.51(8.75-20.27)***

Key: In brackets are CI at 95, **, ***significant at 95% and 99% confidence intervals.

Table 5 displays estimates of conditional logistics regressions between HRQOL and access to healthcare with age as a matched group variable. Overall, access to healthcare was associated with higher HRQOL, and persons with disabilities who had limited access to healthcare, had lower HRQOL (-0.09 $p < 0.038$).

Discussion

Overall, people with disabilities experienced lower HRQOL as compared to the controls. However, there were no differences between the two groups in the psychological and spiritual aspects of HRQOL. Among persons with disabilities, higher overall HRQOL was associated with post-primary education, employment, and income. During the COVID-19 pandemic, persons with disabilities had lower scores on access to healthcare in all domains compared to the controls. Access to healthcare was associated with improved HRQOL in the two groups (0.29 $p < 0.05$). Having a disability was associated with lower HRQOL (-0.37 $p < 0.05$), and limited access to healthcare was related to lower HRQOL.

Quarantine and other containment measures such as social distancing resulted in limited supplies of goods and services, loss of livelihoods, fear and unrest among the people. Persons with disabilities may have been disproportionately affected during the pandemic due to additional challenges they face, such as high unemployment²⁷, loneliness²⁸, and barriers to accessing healthcare. Additionally, persons with disabilities suffer from high levels of poverty, and exclusion from the economic and social life compared to the general population²⁹, which may have worsened their situation and therefore led to a lower HRQOL.

Even though there is limited evidence on the HRQOL of persons with disabilities in the African region during COVID-19, previous studies suggest that pandemics had devastating effects on the general population globally. For instance, Lower HRQOL was reported in China at the pandemic onset³⁰. Lower QoL and negative economic consequences were attributed to the pandemic³¹.

Table 4:

Access to Healthcare Transformed Scores (Mean, SD, Confidence intervals, and p-values)

Access to healthcare domains	Persons with disabilities		Controls		Mean Difference	CI (95%)	P-value
	Mean	Std. Dev.	Mean	Std. Dev.			
Approachability	30.63	13.83	22.43	14.91	-8.20	-10.94-5.45	<0.01
Acceptability	90.30	37.19	73.82	33.71	-16.48	-23.26-9.70	<0.01
Availability	49.97	18.61	41.63	21.85	-8.34	-12.22-4.47	<0.01
Affordability	23.29	10.94	13.35	13.42	-9.94	-12.27-7.59	<0.01
Appropriateness	26.44	15.70	19.75	15.13	-6.69	-9.64-3.75	<0.01
Average score	44.12	19.25	34.19	19.80	-9.93	-65.23-34.05	<0.01

Table 5:

Effect of Access to Healthcare on Health-Related Quality of Life

HRQOL	Overall	Low access to healthcare (overall)	Persons with disabilities with less access to healthcare
	Coefficient	Coefficient	Coefficient
Access to healthcare (overall)	0.04 (0.000) ***	-0.06 (.037)**	-0.09(0.038)**
Observations	424	137	52
Prob > chi2	0.000	0.0285	0.0245
Pseudo R2	0.07	0.07	0.16

Key: In brackets are robust standard errors. **, ***significant at 95% and 99% confidence intervals.



A similar situation was observed in Hong Kong during the SARS crisis, where the pandemic had a negative influence on people's QoL³². A study in Nairobi before COVID-19 established a much higher QoL among people with epilepsy, and the controls than the present study³³. However, the scores for those with epilepsy were lower as compared to the control group.

Of note, there were no statistically significant differences between persons with disabilities and the controls concerning psychological and spiritual aspects of HRQOL. The negative effect of the pandemic on mental health is well evidenced³⁴, and there is also evidence of the role of religion both in engaging and educating populations and being hotspots for risk³⁵. These findings suggest that persons with and without disabilities in Kenya were equally affected by the pandemic in terms of their psychological and spiritual well-being, perhaps due to the far-reaching impact on these domains across society.

Persons with disabilities were less likely to have higher educational attainment and less likely to be employed compared to the controls – two factors associated with increased QoL. This is despite the existence of local and international policy frameworks such as ³⁶, CRPD³⁷, Kenya's Disability Act³⁸ and the Constitution of Kenya³⁹, all of which seek to equalise access to all services, opportunities, and education. Employed people earn an income that is related to QoL and fundamentally related to the affordability of healthcare as shown in the findings, strengthening the link between employment, QoL and health. Income allows a person to afford the essentials of life, including paying bills, accessing healthcare, securing a home in a safer neighbourhood, and providing a sense of self-satisfaction. Results also show that persons with disabilities in employment had fulfilling social relationships, a degree of independence, and felt to be in a safer environment than unemployed

people. Employment gives someone a chance to create networks which have a crucial impact on people's health, well-being, and longevity⁴¹. People with more fulfilling and hence, stronger social relationships can weather stress more easily⁴².

Findings indicate that people with limited access to healthcare during the pandemic had low HRQOL, and those with disabilities had the lowest. This can be explained by various barriers encountered by persons with disabilities in accessing healthcare: unaffordability, untrained healthcare personnel⁴³, attitudinal, informational and cultural barriers⁴⁴, unfriendly hospital infrastructure⁴⁵, and lack of assistive devices and technology⁴⁶. Because of limited mobility, persons with disabilities often require someone to accompany them to the hospital which leads to greater transport costs⁴⁷. Consequently, lack of accompaniment might hinder some of them to seek medical services.

Strengths and Limitations

This is the first study to provide the link between HRQOL and access to healthcare for persons with and without disabilities in Kakamega County, and Kenya at large. The use of WHOQL-100 and Levesque, Harris & Rusell's (2013) frameworks enabled a detailed description of both HRQOL and access to healthcare. However, certain potential limitations may have influenced the findings of the study. The study relied on, *d* and *SD* from Myanmar to compute a sample size due to the absence of local evidence. There was also limited literature especially in the local context, to compare and contrast the findings.

Conclusion

Despite disability-friendly policies in Kenya, persons with disabilities experience limited access to health care. The study findings demonstrate that persons with disabilities have generally lower access to healthcare, and low HRQOL, which was worsened by the COVID 19



pandemic. The study has associated access to healthcare with higher HRQOL. While education, employment and income have been linked to improved HRQOL, the study has shown that persons with disabilities have low educational attainment, and are less likely to be employed.

Recommendations

To improve healthcare access and HRQOL for persons with disabilities. Key actions include providing assistive devices, ensuring disability-friendly infrastructure, and enforcing policies that support improvement of healthcare financing. Stronger anti-discrimination efforts are needed to promote equity in healthcare, employment, and social settings. Moreover, training healthcare workers on disability care and raising awareness about the rights of persons with disabilities are essential for fostering inclusion and addressing labour market inequities.

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