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Health-Related Quality of Life Experiences of Patients Managed with Prolonged Indwelling Urinary Catheters in a Tertiary Urology Outpatient Setting in Northwestern Tanzania

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Abstract

The objective of this research was to assess the quality of life (QoL) experienced by individuals managing long-term indwelling urinary catheters (IUC) in their homes in Northwestern Tanzania. As far as we are aware, this represents the initial report on QoL for home-dwelling patients with long-term IUC across Africa. A descriptive cross-sectional investigation was carried out from December 2016 to September 2017. We conveniently enrolled 202 adult outpatients (aged 18 years or older) who were residing with a long-term IUC. QoL assessment employed the WHOQOL-BREF instrument. Data cleaning and coding were performed in Microsoft Excel, followed by analysis in STATA version 13.0. Descriptive analyses calculated means with standard deviations for continuous variables and frequencies for categorical ones. Associations between variables and QoL were evaluated using t-tests assuming equal variances. Independent samples t-tests compared numerical socio-demographic factors with QoL. Statistical significance was set at $P < 0.05$. In this research, a mean score of 50 or higher denoted good QoL, with higher scores reflecting better QoL. The participants' median age was 69 years (IQR 61–77). Most were male (195, 96.5%), married (187, 92.6%), and possessed primary-level education (116, 57.3%). Overall QoL was low across all domains: physical health mean score 36.67 ± 0.89, psychological domain 29.54 ± 0.87, social relationships 49.59 ± 1.61, and environmental domain 26.05 ± 0.63. Married individuals scored somewhat higher in the social domain (51.1 ± 1.6) compared to unmarried ones (31.1 ± 5.4; $P = 0.001$). Participants with at least primary education had marginally higher environmental domain scores (26.1 ± 0.7) than those without formal education (23.5 ± 1.5; $P = 0.039$). Individuals with long-term IUC in Northwestern Tanzania exhibited generally low QoL in every domain. Married participants and those with primary or higher education showed minor advantages in the social and environmental domains, respectively. We suggest enhancing socioeconomic conditions and providing closer home-based monitoring, particularly for married patients with long-term IUC.

Keywords: Quality of life (QoL), Urinary catheters, Tanzania, Urology

Introduction

Urethral or suprapubic indwelling urinary catheterization (IUC) is frequently utilized to address urinary retention and incontinence. Long-duration transurethral catheterization in males is associated with stricture development as a recognized complication. Research indicates comparable infection risks between urethral and suprapubic approaches, with the latter often involving reduced discomfort [1, 2].

IUC procedures are conducted globally [3-6], and suitable patients are often sent home with the device in place [7-9]. Worldwide evidence shows that extended IUC use imposes substantial economic costs alongside various complications that markedly diminish patients' QoL [10, 11]. Such issues encompass catheter-associated urinary tract infections (CAUTI), blockages, bypassing leakage, bladder contractions, and adverse effects on sexual activity [9, 12, 13]. These challenges affect the overall welfare of patients and caregivers, thereby impairing QoL [4, 14-16]. In low- and middle-income

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nations, chronic conditions impose a greater disease burden than in high-income settings, largely due to socioeconomic disparities that exacerbate poor QoL [17]. In Tanzania, research by Ndomba *et al*. reported a 9.6% prevalence of home-dwelling patients with IUC [18]. This figure may rise as the proportion of elderly individuals (aged 60+) is projected to exceed 7.7% by 2050 [19]. While prevalence data for long-term home IUC use are now available, QoL information remains lacking in Northwestern Tanzania. Evaluating QoL is essential, as it pertains to fundamental human rights. As highlighted in UK-based research, managing an IUC—at home or for a loved one—generates considerable burdens related to physical, emotional, and interpersonal effects [16].

Global investigations into patient experiences with long-term IUC and associated QoL are limited; scant reports emerged from the US (2002–2015) and UK (2013) [4, 20, 21], and a review by Alex *et al*. identified only 15 publications from the USA, Australia, UK, and Turkey (2003–2019) addressing patient needs and QoL in this context [9]. No prior research from Sub-Saharan Africa, including Tanzania, has explored QoL for home-based patients with long-term IUC. This gap in knowledge motivated the present study. Here, QoL refers to a person's comprehensive sense of welfare in achieving aspirations, meeting expectations, and aligning with cultural norms and values. Accordingly, the research sought to evaluate QoL among home-dwelling adults with long-term IUC in Northwestern Tanzania. To our knowledge, this is the inaugural study in Sub-Saharan Africa, specifically Northwestern Tanzania, to illuminate QoL in this patient group.

Materials and Methods

Study design and setting

The research employed a hospital-based cross-sectional design and was carried out between December 2016 and September 2017 in Northwestern Tanzania. Tanzania's population exceeds 56 million, with about one-third residing in urban areas and the majority in rural regions, primarily engaged in agriculture [22]. The investigation took place at the urology outpatient clinic of Bugando Medical Centre (BMC), a tertiary-level consultant and teaching hospital situated in the Northwestern Lake Zone of Tanzania. BMC provides 1000 beds and operates nine outpatient clinics, including the urology unit where data collection occurred. The facility serves a catchment area covering nine regions—Mwanza, Simiyu, Mara, Kagera, Shinyanga, Geita, Tabora, and Kigoma—with a combined population of approximately 13 million, of whom 27.7% are aged 60 years or older.

Participants and eligibility criteria

Eligible participants were adult outpatients aged 18 years and above who had a long-term indwelling urinary catheter (IUC) and provided voluntary informed consent. Individuals with catheters in place for fewer than 14 days were excluded. Sample size calculation utilised the Kish-Leslie formula [23]. Given the absence of prior QoL studies on IUC patients in Sub-Saharan Africa, including Tanzania, a conservative estimated proportion of 15% was applied—lower than the 32.3% reported for elderly QoL in Brazil [24]—to account for the low-resource context, yielding a minimum required sample of 196 patients with long-term IUC.

During the study period, 2112 patients attended the urology clinic for various conditions. From this group, 202 individuals living at home with a long-term IUC (in place for more than 14 days) were prospectively and conveniently enrolled without repetition over nine months. Quality of life was assessed using the WHOQOL-BREF instrument [25], selected for its high emphasis on individualised items [26, 27]. This tool has previously measured QoL in populations with diverse health conditions beyond those of the current participants [28]. It is a cross-culturally validated measure for evaluating overall subjective well-being and has been applied in research involving older adults in Africa [29]. Furthermore, the instrument has been employed in Tanzania by Mwanyangala *et al*. [29].

The questionnaire was adapted to align with the study's requirements, informed by a conceptual framework incorporating individual characteristics, physical (biological), psychosocial, and environmental elements—features that overlapped with the domains of the WHOQOL-BREF, facilitating clearer data collection. To accommodate the predominance of Kiswahili speakers among participants, the tool was translated into Swahili. Reliability and validity were assessed through review by 20 local experts from varied professional backgrounds (physicians, nurses, and academics) as well as a small number of IUC patients. The conceptual model guided interviewers in maintaining focus while administering the WHOQOL-BREF questionnaires.

Data collection

Data gathering focused on core components, including individual characteristics, biological functioning and symptoms, environmental characteristics, and functional status, as detailed below.

Individual characteristics

Sociodemographic and clinical information was obtained from enrolled outpatients living at home with long-term indwelling urinary catheters. Variables collected via the WHOQOL-BREF included age, gender, marital status, religion, residence, occupation, indications for catheterisation, ability to work, sleep patterns, level of education, duration of catheter retention (in weeks), and comorbidities—factors potentially influencing QoL in individuals managing long-term IUC.

Physical domain (biological functioning and symptoms)

Data on biological functioning and symptoms were gathered in line with the conceptual framework through the application of the WHOQOL-BREF instrument. Participants were questioned about any complications or issues arising after catheter placement and during ongoing use. Details collected covered the occurrence of pain, bleeding, catheter dislodgement, leakage, blockages, indicators of infection, and additional comorbidities that might impair comfortable performance of daily activities, thereby influencing QoL.

Environmental, psychological, and social relationship domains (environmental characteristics and functional status)

Information aligned with the conceptual model was obtained via the WHOQOL-BREF tool, focusing on environmental characteristics encompassing both internal and external aspects [30]. For the internal environment, participants responded to inquiries about their worries, personal experiences, and values associated with managing a long-term IUC, which impacted their functional ability to perform daily tasks and consequently their QoL. Regarding the external environment, questions addressed available support structures, including social networks from family, neighbours, healthcare services, community elements such as environmental safety, leisure opportunities, and transportation.

The process of data collection began with identifying clinic schedules and times when enrolled participants attended appointments. A dedicated private room was allocated at the clinic to ensure confidentiality during interviews with selected individuals. Research assistants identified and screened patients with long-term IUC who satisfied inclusion criteria while they waited in the queue to see clinicians. Eligible participants were then guided to the interview room, where the WHOQOL-BREF questionnaires were completed.

Most questionnaires were administered by interviewers, particularly for participants without formal education or those facing challenges in comprehension due to language differences. In such cases, the principal investigator enlisted assistance from accompanying persons to clarify and explain questions, after which the investigator recorded the responses. To minimise bias when relying on escorts for translating difficult questions, the principal investigator first verified that the escort fully understood the question. Upon confirmation, the investigator reiterated to the escort the necessity of relaying the question precisely to obtain accurate responses from the participant.

Ethical considerations and consent to participate

Ethical approval was granted by the Joint Research Ethics and Review Committee of the Catholic University of Health and Allied Sciences (CUHAS)/Bugando Medical Centre (BMC), under clearance number CREC/152/2016. All participants received comprehensive information via a dedicated sheet and provided written informed consent through signing before enrolment.

Data analysis

Analysis of the collected data was performed using STATA version 13 (a statistical software package; College Station, Texas). Descriptive statistics generated means with standard deviations for continuous variables and frequencies for categorical (nominal and ordinal) ones. Associations between variables and QoL were assessed via t-tests assuming equal variances. Inferential approaches included independent samples t-tests to compare numerical socio-demographic factors. Statistical significance was defined as $P < 0.05$. In this research, a mean score of 50 or higher indicated good QoL, with elevated scores corresponding to improved QoL [30].

Results and Discussion

Participants' ages (n=202) spanned 18 to 95 years, with a median of 69 years (IQR 61–77). The vast majority were

male (194, 96%), aged over 65 years (123, 60.9%), and married (187, 92.6%). Primary education was the highest level attained for 159 (78.7%), and over two-thirds (136, 67.3%) worked as subsistence farmers. Religiously, most were Christian (153, 75.7%), and 117 (57.9%) resided outside Mwanza. More than half (111, 54.9%) had retained their catheters for at least 6 weeks, while 123 (60.9%) underwent at least one catheter change during the study period. Urethral catheters were predominant (120, 59.4%). Primary indications included benign prostatic hyperplasia (BPH) in 129 cases (63.9%) and urethral stricture in 34 (16.8%) **(Table 1).**

Table 1. Socio-demographic and clinical characteristics of outpatients living at home with long-term indwelling urinary catheters enrolled in the study

Characteristic	% [IQR]	n / Median
Median age (years) [IQR]**	[61–77]	69
Age group		
< 65 years	39.1	79
≥ 65 years	60.9	123
Gender		
Male	96.0	194
Female	4.0	8
Marital status		
Unmarried	7.4	15
Married	92.6	187
Residence		
Outside Mwanza region	57.9	117
Within Mwanza region	42.1	85
Occupation		
Subsistence farmers	67.3	136
Retired	14.4	29
Small-scale traders	12.9	26
Public sector employees	5.5	11
Religion		
Christian	75.7	153
Muslim	12.9	26
Other	11.4	23
Level of education		
No formal education	21.3	43
Primary education or higher	78.7	159
Duration of catheter retention (weeks)		
3–5 weeks	45.1	91
≥ 6 weeks	54.9	111
Presence of comorbidity*		
No	71.3	144
Yes	28.7	58
Catheter type		
Suprapubic	40.6	82
Urethral	59.4	120
Catheter replacement during study		
Replaced at least once	61.0	123
No replacement	39.1	79
Primary indication for catheterisation		
Benign prostatic hyperplasia	63.9	129
Urethral stricture	16.8	34
Acute/chronic urinary retention	11.9	24

Urinary incontinence	6.4	13

*Comorbidities include hypertension, diabetes mellitus, malignancies, and HIV/AIDS **Continuous variable

Participants managing long-term indwelling urinary catheters (IUC) demonstrated low quality of life across every domain assessed. Overall mean QoL scores fell below the midpoint threshold in all areas for these individuals. The domain most severely impacted was the environmental one, recording a mean score of 26.05 ± 0.63 **(Table 2).**

Table 2. Summary of overall QoL by Domain

Domain	Mean ± SD
Domain 1: physical health	36.67 ± 0.89
Domain 2: psychological	29.54 ± 0.87
Domain 3: social relationship	49.59 ± 1.61
Domain 4: environment	26.05 ± 0.63

Mean scores across the various domains are presented according to participants' socio-demographic factors—including age, gender, educational attainment, and marital status—as well as clinical factors such as catheter duration in place, catheter type, and whether the catheter was replaced. No variations in quality of life were noted based on age or gender. In contrast, married individuals showed marginally higher scores in the social relationships domain (51.1 ± 1.6) compared to unmarried participants (31.1 ± 5.4; P < 0.001). Those with primary education or higher exhibited slightly improved QoL in the environmental domain (26.1 ± 0.7) relative to individuals without formal education (23.5 ± 1.5; P = 0.039). No differences across domains were observed in relation to catheter type or catheter replacement **(Table 3).**

Table 3. Comparison of WHO QOL-BREF domain score with socio-demographic factors and duration of catheter in-situ

Variable	Frequency(N)	Mean Scores of QoL domain			
		Physical Health	**Psychological**	**Social relationship**	**Environment**
		Mean ± SD	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**
Age					
Below 65	79	36.1 ± 1.4	29.6 ± 1.3	49.9 ± 2.8	26.3 ± 1.1
Above 65	123	37.0 ± 1.1	29.5 ± 1.2	49.4 ± 2.0	25.9 ± 0.8
P-value from t test		0.5927	0.9629	0.8787	0.7489
Sex					
Males	194	36.7 ± 0.9	29.7 ± 0.9	49.7 ± 1.6	26.0 ± 0.7
Females	8	34.8 ± 3.9	24.5 ± 2.8	47.9 ± 10.6	27.3 ± 1.6
P-value from t test		0.6728	0.2379	0.8334	0.6792
Education					
Illiterate	43	33.5 ± 2.1	26.4 ± 1.7	44.2 ± 3.9	23.5 ± 1.5
Primary & above	159	37.5 ± 1.0	30.4 ± 1.0	51.0 ± 1.7	26.1 ± 0.7
P-value from t test		0.0602	0.0566	0.0804	0.0390
Marital status					
Married	187	36.9 ± 0.9	29.5 ± 0.9	51.1 ± 1.6	26.1 ± 0.7
Single	15	34.0 ± 3.1	29.7 ± 2.8	31.1 ± 5.4	25 ± 1.8
P-value from t test		0.4031	0.9523	0.001	0.6385
Duration of catheter in situ					
3 – 5 weeks	91	35.3 ± 1.3	29.3 ± 1.2	51.3 ± 2.5	26.1 ± 0.9
≥ 6 weeks	111	37.8 ± 1.2	29.7 ± 1.2	48.2 ± 2.1	26.0 ± 0.9
P-value from t test		0.1568	0.8080	0.3409	0.9466
Catheter type					
Supra	82	36.9 ± 1.4	30.7. ± 1.4	50.0. ± 2.5	26.6 ± 0.9
Urethral	120	36.5 ± 1.1	28.8. ± 1.1	49.3 ± 2.1	25.7 ± 0.8
P-value from t test		0.2379	0.2735	0.8325	0.5057
Catheter Change					

Yes	123	37.3 ± 1.1	29.7 ± 1.1	50.0 ± 2.0	26.8 ± 0.8
No	79	35.8 ± 1.5	29.2 ± 1.5	48.9. ± 2.7	25.0 ± 0.9
P-value from t test		0.4117	0.7696	0.7496	0.1669

Across all four WHOQOL-BREF domains—physical health, psychological well-being, social relationships, and environmental factors—quality of life was found to be low among individuals residing at home with long-term indwelling urinary catheters (IUC) in Northwestern Tanzania. These results align with research conducted in rural Kerala, India, among older adults, where QoL mean scores were substandard in every domain, with the psychosocial area particularly impaired [31]. To date, no prior investigation has examined this issue in Northwestern Tanzania, the country overall, or broader Sub-Saharan Africa, as highlighted by Alex *et al*., who identified only 15 publications from the USA, Australia, UK, and Turkey between 2003 and 2019 addressing patient needs and QoL related to indwelling urinary catheters [9].

The observed low QoL in this study may stem from several contributing elements: most participants were over 60 years old, possessed only primary-level education, were unlikely to hold well-remunerated positions, had retained their catheters for extended periods without a clear timeline for removal, and primarily worked as subsistence farmers relying on low-yield manual agriculture for survival. In the context of a low- to middle-income country (LMIC), approximately 28.7% of participants also presented with comorbidities including hypertension, diabetes, malignancies, and HIV/AIDS. Existing literature indicates that QoL in LMIC populations is adversely influenced by non-communicable diseases, which often remain inadequately managed due to socioeconomic constraints [17, 29, 31, 32].

Additionally, a recent investigation by Ndomba *et al*. [33] on urinary tract infections among IUC patients reported a 56.8% overall prevalence of laboratory-confirmed catheter-associated urinary tract infections (CA-UTI). The rate was markedly higher in long-term IUC cases compared to short-term ones (82.2% vs. 35.3%; $p < 0.001$). Outpatient participants further reported complications such as leakage combined with CA-UTI (11.9%), blockage with CA-UTI (10.4%), bleeding with CA-UTI (5.4%), and isolated urine leakage (1.5%). These patterns mirror observations by Alex *et al*. and Ikuerowo *et al*. [9, 10], who noted recurrent infections, catheter obstructions, and bypassing as common adverse events in long-term catheter users. Collectively, these challenges likely exert substantial negative effects, resulting in substandard scores across all QoL sub-domains.

Another Tanzanian study by Ndomba *et al*. [18] on the prevalence and reasons for long-term IUC use among outpatients revealed that many individuals experienced delays in treating underlying conditions owing to absent health insurance, leading to prolonged catheter dependence and diminished QoL. In comparison, research by Mwanyangala *et al*. [29] on health and QoL among rural older Tanzanians—sharing similar socio-demographic profiles with our cohort but without IUC—reported mean and median WHOQOL scores of 68.2 and 68.8, respectively, versus 26.1 and 49.6 in domains affected here. This contrast underscores the additional burden imposed by an indwelling urinary catheter on physical, social, psychological, and environmental aspects of life. As noted by Mackay *et al*. [16], managing an indwelling urethral catheter—for oneself or a loved one—imposes considerable strain across physical, emotional, and interpersonal dimensions.

Regrettably, this patient group has largely been overlooked in assessments of their quality of life and in developing interventions to enhance their welfare. Mackay *et al*. [16] aptly observed that "The population of urinary catheter users is often forgotten by wider society because the issues they experience on a regular and recurrent basis are not visible, are not directly life-threatening, and are not discussed". Addressing this knowledge gap regarding the QoL of this vulnerable population is essential for gaining insight into their experiences and informing strategies to improve their overall well-being.

Although mean scores were low across all four domains, the research uncovered notable associations linked to specific socio-demographic factors, particularly educational attainment and marital status, in relation to reduced QoL. Participants with primary-level education showed marginally higher QoL in the environmental domain. This improvement may relate to aspects of the internal environment, encompassing personal experiences, worries, and beliefs. For older individuals managing long-term IUC, these internal elements play a critical role in shaping overall QoL. Additionally,

effective management of the external environment is vital for preventing infections in those with prolonged catheter use. Even a modest level of schooling, such as primary education, appears to positively influence QoL for patients living with long-term IUC. The results suggest that providing these individuals with sufficient knowledge on home catheter care could substantially elevate their QoL. Regrettably, as the inaugural investigation of its kind in Tanzania and Sub-Saharan Africa addressing QoL among home-based patients with long-term IUC, direct regional comparisons are unavailable. Research from the UK by Mackay *et al*. [16] emphasises the need for educational interventions to enable patients to actively participate in their catheter management, thereby enhancing QoL for themselves and their caregivers.

Similarly, married participants exhibited somewhat higher QoL in the social relationships domain compared to unmarried ones—a pattern echoed in prior studies where married individuals reported superior QoL [29, 31]. The majority of participants were married men, and cultural norms often position women as primary providers of care and emotional support during illness, particularly in cases involving IUC. Thus, empowering spouses—predominantly women—with comprehensive training on assisting with long-term catheter care could significantly raise QoL to more satisfactory levels, as suggested by Mackay *et al*. [16]. This represents a valuable insight from the current work. Furthermore, Tanzania's ingrained community values and neighbourhood support networks likely contribute positively to QoL within this domain.

Numerous investigations have explored IUC globally [34-40] and QoL among older populations [24, 27-29, 31, 41]. Yet, research specifically examining QoL in older adults with long-term IUC remains scarce worldwide, with none conducted in Sub-Saharan Africa [9, 24]. To our knowledge, this represents the pioneering effort to document QoL among older patients managing long-term IUC in Northwestern Tanzania and across Sub-Saharan Africa.

Study limitations

Female participants with long-term IUC were underrepresented, comprising only eight individuals. In the community, women rarely manage long-term catheters at home, as most are referred to the Comprehensive Community-Based Rehabilitation in Tanzania (CCBRT) programme for disability prevention prior to discharge. Consequently, the findings may not fully capture women's experiences. Nevertheless, the inclusion of these few women provided valuable insights into their QoL across the four WHOQOL-BREF domains when living with long-term IUC.

The cross-sectional design involved a single-time-point assessment, which could have influenced scores based on participants' momentary mood or condition during the interview, potentially leading to understated results. A longitudinal approach might yield similar or varying outcomes. Future research employing longitudinal designs is recommended to better elucidate relationships among the domains.

Conclusion

Overall, quality of life among individuals with long-term indwelling urinary catheters in Northwestern Tanzania was low across all domains. Participants with at least primary education and those who were married demonstrated minor improvements in the environmental and social domains, respectively. Recommendations include efforts to enhance socioeconomic conditions, emphasise regular home monitoring—especially for married patients—and provide married individuals and their spouses with thorough education on home catheter management. Such measures could markedly improve QoL, particularly in the environmental and psychological domains.

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