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Health-Related Quality of Life for the Insured and Non-Insured Elderly in Rural Tanzania: A Cross-Sectional Study

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Abstract

Introduction

The growing number of elderlies in low—and middle-income countries is straining healthcare systems. Affordable health services are essential to prevent poor health outcomes and low quality of life. Health insurance can improve access to care and enhance the quality of life for elderly individuals. This study compares the quality of life of elderly individuals with and without health insurance.

Methods

A household survey was conducted in the Nzega and Igunga districts in the Tabora region of Tanzania from 2017 to 2022. The survey used a multistage sampling method to select wards, villages in each district, and households with elderly residents. The European Quality of Life 5-dimension 3-level (EQ-5D-3L) instrument was used to assess health-related quality of life (HRQoL), including the EQ-5D descriptive system and the EQ visual analog scale (EQ VAS). Value sets from Zimbabwe were used to calculate HRQoL. The survey used crude and adjusted linear regression analyses to assess the relationship between HRQoL and HI by accounting for confounding factors.

Results

A total of 1,899 elderly individuals aged 60 years and above participated in the study, with the majority (58%) falling in the 60-69 age group. Among the participants, 45% were married, and only 44% had insurance coverage. The overall mean EQ-5D and EQ-VAS scores were slightly higher for the uninsured elderly (0.75 and 61.20) compared to the insured elderly (0.73 and 60.31). According to the linear crude model, there is a decrease in HRQoL among the uninsured compared to the insured. This trend was also observed in the adjusted model, although it was not statistically significant (p=0.052).

Conclusion

Access to health insurance can significantly improve the HRQoL for elderly populations in Tanzania. These findings are crucial for policymakers. Extending health insurance coverage to vulnerable sub-populations like the elderly should be a priority, with targeted financial subsidies for HI premiums. This initiative would be a significant step towards achieving universal health coverage in Tanzania, ensuring a higher quality of life for all citizens.

Keywords: *Rural, Tanzania, HRQoL, Health insurance, Elderly, and financial risk protection*

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INTRODUCTION

The global population of individuals aged 60 and above is rising and is anticipated to escalate further in the forthcoming years. (Nations, 2015). Between 2015 and 2030, this number is projected to grow by 56% (901 million to 1.4 billion) and will amount to 2.1 billion by 2050 (Nations, 2015). The elderly group is at increased risk of poor health status, and this puts pressure on health systems during priority setting to provide not only quality but also accessible, adequate, and affordable healthcare. In low and middle-income countries (LMICs), the number of elderly grows faster in rural compared to urban areas (Nations, 2017; Razzaque et al., 2010; "Track. Univers. Heal. Cover. 2017 Glob. Monit. Rep.," 2017). The elderly, especially in rural areas, face several challenges, such as low financial support, as well as poor and limited access to social services, including primary health care, which may contribute to poor quality of life (Isangula, 2022).

Many LMICs, including Tanzania, do not have functional social protection mechanisms that cater to elderly people outside the government sector (George et al., 2021; URT, 2016). In this regard, households with elderly people are responsible for all related costs of life, including access to and use of healthcare services. In turn, this may increase the risk of catastrophic health expenditure to those households and thus may lead to poor quality of life among the elderly (Adisa, 2015). Health sector reforms of the 1990s in many LMICs, among other things, focused and prioritized on improving health and well-being (National Bureau of Statistics (NBS) & Office of Chief Government Statistician (OCGS), 2013) of citizens, including this important group of the elderly. Despite the implementation of reforms, the healthcare systems in numerous low- and middle-income countries (LMICs), including Tanzania, continue to grapple with the challenges posed by the effects of aging on the health status, quality of life, and overall well-being of the elderly population. (Mwanyangala et al., 2010a) due to the likely increased prevalence of non-communicable diseases and other chronic illnesses. There is a need for the health systems of the LMICs to make further efforts by formulating new policies or amending the existing ones to target the elderly poor, particularly those dwelling in rural areas (Hoi, 2011) where access to health services is not guaranteed (Mubyazi, 2004).

For example, the out-of-pocket (OOP) payment system, which is impliedly practiced in Tanzania, affects poorer households in rural areas, and some are driven into catastrophic health expenditure and impoverishment (Garg et al., 2019; Prinja et al., 2017). To counter the effects of OOP, Tanzania introduced two pre-paid systems, beginning with the Community Health Fund (CHF) in 1996 and later the National Health Insurance Fund (NHIF) in 2001. Initially, CHF was introduced as a specific mechanism to enable access to basic but affordable quality healthcare services for rural households (Lekashingo, 2012; Mungunasi E, Lee S, Verbeek J, Zacchia P, Biseko D, Nasman N, 2010). Following the need for improved operationalization and service availability, CHF nomenclature was recently replaced with improved Community Health Fund (iCHF). In this new structure, iCHF will involve village officers to quicken the enrolment process, provider-purchaser split and pooling of funds at the regional level (Kigume & Maluka, 2021). Membership to iCHF remains voluntary, and each household within a district contributes the same amount of the agreed premium. Each member is given an identity card (Lekashingo, 2012) that entitles the household to access the basic package of preventive and curative health services within the district health facilities throughout the year. On the other side, NHIF was introduced in 2001 to cover the healthcare services of government sector servants. As it was for CHF, in the recent past, NHIF policy was amended to accommodate the diverse groups of the Tanzanian population, including those outside the government sector (Eastern & Centre, 2015).

Although the NHIF remains compulsory for government sector employees, it is voluntary for the members of the other sectors. Whereas all subscribed members of iCHF can access services at the public primary health facilities, those under NHIF access services at all public, charity, and private facilities across different levels of the health system (Macha et al., 2014a; Mills et al., 2012). Regarding NHIF, once an insured government staff retires from service, their insurance coverage continues to operate but remains valid for the principal member and their spouse only (Amani et al., 2021; Government of Tanzania, 1999).

Besides health insurance (HI), an exemption policy can be accessed by the elderly, particularly those who are not insured. Once established that they (the elderly) are not able to pay for their healthcare costs, they are given an exemption card to present at a public health facility when accessing healthcare. However, operationalization of the exemption policy has many challenges, including difficulties in confirming clients' age due to limitations in the birth registry system, which leaves most of the elderly population without birth certificates (Maluka, 2013). Furthermore, due to the limited availability of resources in the health sector, the government spends a small portion on elderly health services that do not cover all the exempted fees for the elderly (Mwanyangala et al., 2010a; National Bureau of Statistics (NBS) & Office of Chief Government Statistician (OCGS), 2013). As a result, most of the elderly in rural areas opt to use the OOP payment system, which is associated with catastrophic health expenditure, poverty, and poor quality of life (Aregbeshola & Khan, 2018; Brinda et al., 2014).

HI is meant to provide financial risk protection to its members. Many studies indicate the importance of HI in improving access to healthcare and quality of life (Jalali et al., 2021). It has been shown to provide financial protection, improve equity in access to healthcare, reduce stress about healthcare costs, improve preventive care, and reduce out-of-pocket payments, which may contribute to improved quality of life among the elderly (Kitole et al., 2022b; Kitole, Lihawa, & Mkuna, 2023). Quality of life can be measured using the EQ-5D, a generic instrument that describes the health-related quality of life (HRQoL) (Rabin et al., 2015; Van Hout et al., 2012). HRQoL is a multidimensional concept that typically encompasses subjective evaluations of various aspects of life, including physical, mental, emotional, and social functioning, which aid in comparing individuals' health status.

Studies on assessing HRQoL for the elderly focus on the impact of aging on health status and quality of life (31). Other health-related studies involving the elderly focus on health factors associated with the risk of out-of-pocket expenditure, financial protection, and catastrophic health expenditure (Brinda et al., 2012).No study has explicitly studied the association between HRQoL and HI among the elderly in Tanzania. Therefore, this study aimed to fill the gap by assessing the HRQoL of the elderly, comparing those with HI versus those with no HI. Findings may contribute to the justification of the recently enacted universal health insurance (UHI) bill specifically for this fast-growing elderly population in Tanzania.

METHODS

Study setting

This study was conducted in the Nzega and Igunga districts in the Tabora region in Tanzania (Figure 1). According to the National Bureau of Statistics (NBS), the districts have a total population of 901,979 (Nzega is 502,252, and Igunga is 399,727). Of the two districts' total population, 6% are elderly.(National Bureau of Statistics (NBS), 2017)These districts were appropriate for our study because CHF was first introduced in Igunga district as a pilot before other districts in Tanzania. Nzega district was then chosen for logistical reasons, as it is a neighboring Igunga district with a substantial number of elderly persons with HI. Nzega is divided into 37 wards with 151 villages, and Igunga is divided into 26 wards with 93 villages.

Study design, sampling techniques, and sample size

A cross-sectional household survey was conducted and involved a total of 1,899 respondents. Multistage sampling was used to select each district's wards, villages, and respondents. In the first stage, seven wards were selected purposively from each district based on the population size and proximity between the wards. In the second stage, 58 geographically reachable villages were randomly selected using a lottery method. In the third stage, a purposive sampling technique was used to identify and select 25 to 44 households with an elderly person from each village, depending on the village size. Consideration was given to gender balance in the selection of respondents. The required minimum sample size was determined to be 733 participants. This sample size was calculated assuming the prevalence of the outcome of 40% of the elderly with HI, design effect of 2, 95% confidence interval (CI), and 80% power (Altman DG, 1997). We then doubled the sample to have a representative group of men and women. Ward and Hamlet's officers helped the researchers identify households with elderly person(s).

Measurement of health-related quality of life

The HRQoL was measured using an EQ-5D-3L instrument (Drummond, 2005; Jelsma et al., 2003). EQ-5D-3L is a standardized instrument developed by the EuroQol Group that measures the health status of individuals to provide a simple, generic measure of health for clinical and economic appraisal (Van Reenen et al., 2021). As previously mentioned, the EQ-5D-3L is a validated and widely used generic instrument that describes health states. The instrument has two parts: the EQ-5D descriptive system and the EQ visual analog scale (EQ VAS). The EQ-5D descriptive system comprises five dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression), whereby each dimension is divided into three severity levels (no problems, some problems, extreme problems) (Hanmer et al., 2015; Murray & Lopez, 1996; Whitehead & Ali, 2010)The respondent was asked to indicate his/her health state by choosing the most appropriate statement in each of the five dimensions. This instrument allows the respondent to indicate 253 unique combinations of health states.

Each health state has a utility value on a scale of 0 to 1, whereby 0 represents death and 1 represents perfect health. The EQ VAS records the respondent's self-rated health on a vertical VAS where the endpoints are 100- 'the best health you can imagine' and 0- 'the worst health you can imagine'. This information can be used as a quantitative measure of health outcomes as judged by the respondents (36). Since the EQ-5D and EQ VAS can capture all benefits of healthcare intervention in a single index, it allows for the comparison between intervention outcomes of different individuals (Wonderling et al., 2005; Yfantopoulos, 2001). The EQ-5D-3L were interviewer administered face-to-face in Kiswahili language. The translated version of the instrument is available from the EUROQOL website after registration (https://euroqol.org/register/obtain-eq-5d/available-versions/). Translation of the instrument followed international guidelines and involved forward translation, back translation, and cognitive debriefing to maintain meaning. Two researchers and four trained researcher assistants collected data at a private place in/near the respondent's household.

Variables

This study included socio-demographic variables (sex, age, marital status, education level, type of residence, working status, and socio-economic status), which were used as predictors. Sex was categorized as being female or male. Age was categorized into 60–69, 70–79, 80–89, and 90+). Marital

status included those who were married (i.e., currently married and cohabiting) and non-married (i.e., widows, separated, never married, and divorced). Education was categorized into four categories, including those with no formal education, low (4–8 years with primary education), middle (11–14 years with secondary education), and high (university education). The type of residence included those who live in urban and rural areas. Working status was categorized into two categories (those not currently working and those who are currently working for a living).

In addition, socioeconomic status was constructed using Principal Component Analysis (PCA) by using the Stata program, whereby several steps were performed. The socio-economic status in this study included material ownership (assets) and occupation. Step 1: Selection of variables that were used for PCA (electricity, bicycle, motorcycle, television, radio, pressing iron, refrigerator, mobile phone, car, computer, land, cattle, income, and occupation). Step 2: Generation of dummy variables. Step 3: Check for multicollinearity (correlation of the coefficient between variables) and list all variables for PCA. Step 4: Checking the assumptions for PCA (Bartlett's Test and Kaiser–Meyer–Olkin [KMO] measure of sampling adequacy), which found the value of KMO > 0.5. Step 5: Construction of the PCA, and Eigen factors and Eigenvalues were checked. Step 6: Graphing the Eigenvalue. Step 7: Computing the component score using a command to predict f1 f2 f3. Step 8: Categorization of component scores into quintiles to be used in the regression as a predictor (Ng, 2017; Stata, 2013)Whether respondents were currently enrolled in HI (Yes or No) was used to determine their possession of HI. The possession of health insurance included ownership of public (e.g. NHIF or CHF) and other private health insurance.

Data analysis

To generate the HRQoL index, responses from the EQ-5D-3L were converted into a single number by applying the value sets from Zimbabwe (Joseph Newton et al., 2011). The EQ-5D command from STATA generates an index value using the individual responses on mobility, self-care, usual activities, pain or discomfort, and anxiety/depression (Joseph Newton et al., 2011). Zimbabwe value sets were used since Zimbabwe closely resembles contextual and population characteristics to Tanzania. EQ-5D score ranged between 0 (death) and 1 (perfect health). EQ-VAS score ranged between 0 (worst imaginable health) and 100 (best imaginable health). t-test was used to compare the HRQoL (EQ-5D and EQ-VAS) scores between insured and non-insured elderly. In addition, crude and adjusted linear regression analyses were conducted to assess the association between HRQoL and HI, adjusting for confounders- age, sex, education level, income level, and marital status, as applied in HRQoL studies (Gebru & Lentiro, 2018; Nasim et al., 2022). All analyses were conducted using STATA statistical software version 15.

RESULTS

Characteristics of respondents

As indicated in Table 1, this study's total number of respondents was 1,899 elderly people aged 60 years and above. Most belonged to the 60-69 age group, were unmarried, and were not educated, and almost an equal number resided in rural or urban areas. Most respondents were engaged in small economic activities like subsistence agriculture and had low socioeconomic status.

Table 1: Characteristics of respondents (n=1,899)

	Female	Male	Total
Age group			
60–69	594 (61.3)	517 (55.59)	1111 (58.5)
70–79	242 (24.97)	264 (28.39)	506 (26.65)
80–89	116 (11.97)	113 (12.15)	229 (12.12)
90+	17 (1.8)	36 (3.9)	53 (2.8)
Total	969 (51.03)	930 (48.97)	1899
Marital status			
Married	279 (28.79)	569 (61.18)	848 (44.66)
Not married	690 (71.21)	361 (38.82)	1051 (55.34)
Total	969	930	1899
Education level			
No	655 (67.6 %)	472 (50.81%)	1,127 (59.35)
Low	158 (16.3)	204 (21.9)	362 (19.1)
Middle	138 (14.2)	219 (23.6)	357 (18.8)
High	18 (1.9)	35 (3.8)	53 (2.8)
Total	969	930	1899
Residence			
Rural	502 (51.8)	451 (48.5)	953 (50.2)
Urban	467 (48.2)	479 (51.5)	946 (49.8)
Total	969	930	1899
Currently working (economic activities)			
No	411 (42.41)	311 (33.44)	722 (38.02)
Yes	558 (57.59)	619 (66.56)	1,177 (61.98)
Total	969	630	1899
Socio-economic status			
Low (q1)	721 (74)	696(75)	1417 (75)
Middle (q2)	46 (5)	39(4)	85 (4)
High (q3)	202 (21)	195(21)	397 (21)
Total	969	930	1899 (100)

Insurance status among the elderly

Only 44.3% of the respondents had health insurance. Within this group, 94% were affiliated with either CHF or NHIF, while only 6% were covered by private health insurance.

Health-related quality of life in the elderly

The overall mean score among the elderly for EQ-5D was 0.74, and for EQ VAS was 60.81. For the chronic diseases, the mean score was 0.92; the mobility mean score was 1.62; the self-care mean score was 1.38; the pain/discomfort mean score was 0.09 and the anxiety/depression mean score was 0.05 as indicated in Table 2.

Table 2: Overall mean score for HRQoL for all elderly (n=1899)

Health Profile	Overall Score Mean			
	Obs.	Mean	95% C.I.	
EQ-5D	1,899	0.74	0.73	0.75
VAS	1,899	60.81	59.96	61.65
Chronic diseases	1,899	0.92	0.89	0.95
Mobility	1,899	1.62	1.60	1.64
Self-care	1,899	1.38	1.36	1.40
Pain/Discomfort	1,899	0.09	0.09	0.10
Anxiety/depression	1,899	0.05	0.05	0.05

Health-related quality of life and health insurance status

When you consider insured and uninsured separately, the overall means of EQ-5D and EQ VAS, are slightly higher for the elderly who are not insured compared to the insured (Table 3). The p-value for the difference between the non-

insured and insured is 0.03, which indicates that the difference in means between the two groups is statistically significant. For the VAS measure, although the p-value is not statistically significant (p=0.31), the results indicate that the elderly without HI have a higher mean VAS compared to the insured (Table 3).

Nonetheless, when you consider each domain individually, findings show that chronic disease, mobility, self-care, and pain/discomfort have higher mean values for insured elderly than those not insured. In contrast, anxiety/depression had the same mean value among the insured and uninsured elderly (Table 3).

Table 3: HRQoL for insured vs uninsured elderly (n=1,899)

Health Profile	Uninsured			Insured		
	Obs.	Mean	95% C.I.	Obs.	Mean	95% C.I.
EQ-5D *(p=0.03)*	1,058	0.75	0.73 0.76	841	0.73	0.71 0.74
VAS *(p=0.31)*	1,058	61.20	60.06 62.34	841	60.31	59.04 61.59
Chronic diseases	1,058	0.92	0.88 0.96	841	0.93	0.88 0.97
Mobility	1,058	1.60	1.56 1.63	841	1.65	1.62 1.69
Self-care	1,058	1.36	1.33 1.39	841	1.41	1.37 1.44
Pain/Discomfort	1,058	0.09	0.09 0.10	841	0.10	0.09 0.10
Anxiety/depression	1,058	0.05	0.05 0.06	841	0.05	0.05 0.06

Many of the elderly reported no or moderate problems with mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. More issues were reported in mobility and pain/discomfort (Table 4).

Table 4: Frequency of reported problems by EQ-5D dimensions and levels (n=1,899)

	Uninsured	Insured	Total
Mobility			
No problem	444 (41.97)	306 (36.39)	750 (39.49)
Moderate	598 (56.52)	520 (61.83)	1,118 (58.87)
Severe	16 (1.51)	15 (1.78)	31 (1.63)
Self-care			
No problem	689 (65.12)	506 (60.17)	1,195 (62.9)
Moderate	362 (34.22)	327 (38.88)	689 (36.3)
Severe	7 (0.66)	8 (0.95)	15 (0.8)
Usual activities			
No problem	578 (54.6)	421 (50.06)	999 (52.6)
Moderate	457 (43.2)	399 (47.4)	856 (45.1)
Severe	23 (2.2)	21 (2.5)	44 (2.3)
Pain/discomfort			
No problem	380 (35.9)	287 (34.1)	667 (35.1)
Moderate	630 (59.6)	508 (60.4)	1,138 (59.9)
Severe	48 (4.5)	46 (5.5)	94 (5.0)
Anxiety/depression			
No problem	498 (47.1)	359 (42.7)	857 (45.1)
Moderate	481 (45.5)	418 (49.7)	899 (47.3)
Severe	79 (7.5)	64 (7.6)	143 (7.5)

Factors associated with health-related quality of life

The crude model of the Linear regression analysis indicated that HRQoL was statistically significantly associated with HI status, whereby HRQoL was lower among uninsured compared to those insured (table 5). Even after HI was adjusted with other variables, HRQoL was still lower among the uninsured compared to those the insured. However, there was no statistically significant association between HI status and HRQoL. Age and sex variables were associated with quality of life. Being older than 69 years was associated with a lower quality of life, whereas being male was associated with a higher quality of life. Income was also positively associated with HRQoL (Tabel 5).

Table 5: Association between HRQoL and HI status

HRQoL	Coef.	P>|t|	95% CI		Coef.	P>|t|	95% CI	
	Crude Model				Adjusted model			
Health Insurance (HI)								
Insured (ref.)	0.000				0.000			
Uninsured	-0.019	0.032	-0.036	-0.002	-0.017	0.052	-0.034	0.000
Age								
60-69(ref.)	0.000				0.000			
70-79	-0.030	0.003	-0.050	-0.010	-0.033	0.001	-0.053	-0.014
80-89	-0.057	0.000	-0.084	-0.030	-0.060	0.000	-0.087	-0.033
90+	-0.158	0.000	-0.209	-0.106	-0.160	0.000	-0.212	-0.109
Sex								
Female(ref.)	0.000				0.000			
Male	0.027	0.002	0.009	0.044	0.029	0.002	0.011	0.047
Education								
Formal Education(ref.)	0.000				0.000			
Informal Education	-0.004	0.651	-0.021	0.013	-0.012	0.187	-0.029	0.006
Income								
Less 22 USD (ref.)	0.000				0.000			
22 - 55 USD	0.034	0.008	0.009	0.059	0.033	0.009	0.008	0.058
65.6 - 109 USD	0.059	0.001	0.023	0.095	0.050	0.006	0.014	0.086
110 USD +	0.007	0.557	-0.015	0.028	0.010	0.342	-0.011	0.032
Marital status								
Married(ref.)	0.000				0.000			
Not married	-0.018	0.045	-0.035	0.000	-0.012	0.210	-0.030	0.007

p=0.005, C.I.=Confidence Interval, Coef. = Coefficients and ref = Reference category

DISCUSSION

Findings from our study show that HI coverage among the elderly was below 50%, where close to all elderly are covered by public HI. This may be because most of the public HI, especially CHF covers people from rural areas and the informal sector in Tanzania (Chomi et al., 2014; Kitole, Lihawa, Nsindagi, et al., 2023; Mtei & Mulligan, 2007). This implies that the majority of the elderly are dependent on public insurance coverage, which is low cost compared to private HI, which can be unaffordable, especially for older populations like the one in our study, the majority of whom belong to the low socioeconomic group. Similar findings (Ayanore et al., 2019; Lloyd-Sherlock et al., 2015) show that HI status among the elderly depends on their socio-economic status whereby poor elderly, unmarried (single) and old women cannot afford to have private HI. This finding highlights the importance of expanding health insurance coverage through the recently mandated UHI, where the elderly will have coverage through mandatory contributions and those who cannot afford will be covered through government support.

The overall quality of life among the elderly in our study area is 0.74 for EQ-5D and 60.81 for EQ-VAS. Many elderly have reported issues with the specific dimensions of quality of life, but most had issues with mobility, pain/discomfort, and some anxiety and depression. On average, chronic diseases, problems with self-care, pain/discomfort, anxiety, and

depression are quite common with an increase in age. These findings are similar to those of other studies (Kitole et al., 2022a; Mwanyangala et al., 2010b), which indicated that the main reason could be an increase in age. This means that as age increases, the health status and physical ability of the elderly deteriorate (Baxter et al., 2008), making social protection necessary for prioritization as the population ages due to recent improvements in life expectancy.

When you look at quality of life differences between the insured and uninsured elderly separately, the overall mean score for the uninsured is only slightly higher compared to the insured. However, this dissolves as we look at each specific domain where findings show better scores for chronic disease, mobility, self-care, and pain/discomfort among the insured elderly compared to those who are not insured, while anxiety/depression is the same in the two groups. Additionally, our regression analysis reveals a positive correlation between having HI and an enhanced quality of life for the elderly within our research parameters. One reason may be that the elderly with HI have the possibility of regular check-ups of their health compared to those with no insurance. Another study we conducted in the same population found that there is an association between HI and healthcare service use among the elderly in Igunga and Nzega districts (Kitole et al., et al., 2023). Other studies from Tanzania and elsewhere concur with the findings, which indicated that HI is associated with better health outcomes, which improve the health status of the elderly (Committee on the Consequences of Uninsurance, 2002), which ultimately leads to the increase of HRQoL. Studies on elderly health status done in the United States and another done on children's health status in Pakistan identified that the general health of the elderly and children was likely to be good among those with HI compared to those without HI (Aziz et al., 2022; Committee on the Consequences of Uninsurance, 2002; Michael McWilliams, 2009). Uninsured elderly are vulnerable to catastrophic health expenditure, which may drag them into poverty and, ultimately, poor health status with low HRQoL (Bintabara et al., 2018; Chomi et al., 2014; Fiestas Navarrete et al., 2019; Msuya et al., 2007). Uninsured elderlies are less likely to receive basic healthcare services at the healthcare facility compared to the insured elderly. This is because HI provides more extensive coverage of preventive and screening services and more appropriate healthcare service use. Also, it reduces inequity in access to healthcare services which may pave the way to universal health coverage (Committee on the Consequences of Uninsurance, 2002; Kitole et al., 2022a; Kitole et al., 2023).

There was a small difference in the overall mean HRQoL in the insured and uninsured elderly, indicating a slightly higher mean quality of life for the uninsured compared to the insured elderly. Two reasons might explain this observation; first, is the existence of an exemption policy that covered the elderly in Tanzania, where the elderly benefited from being exempted from payments when accessing health care services, hence improving their access to health care even without having HI (Edward & Maluka, 2021; Kitole et al., 2022b). Secondly, since most of the HI schemes in Tanzania were voluntary to non-public servants, adverse selection problems may explain the poor HRQoL among the insured. Most of the elderly who are likely to join HI schemes voluntarily are those who are at risk of illness or already have a chronic illness (Belli, 2001; Macha et al., 2014b). Studies done in Tanzania, Burkina Faso, Ghana, and Pakistan indicated that adverse selection is an important concern for the voluntary HI schemes that the elderly or clients with the highest expected cost or at risk of chronic diseases are those with the highest willingness to pay for joining HI schemes (Durizzo et al., 2022; Macha et al., 2014b; Parmar et al., 2012; Rajkotia & Frick, 2012) This also highlights the importance of mandatory health insurance (with government subsidy for the poorest) for all citizens and residents, which would allow cross-subsidization by risk of illness and ability to pay.

Findings also show being female and of a higher income status are associated with lower HRQoL. This finding confirms what has been found in other empirical studies (Baxter et al., 2008; Mwanyangala et al., 2010b; Roy & Chaudhuri, 2008). Higher income may affect the quality of life due to the burden of diseases of affluence among the higher-income elderly, which means that, as income increases, they may adopt poorer lifestyles, such as eating diets high in protein and fat and adopting sedentary lifestyles, causing non-communicable diseases. Being female is associated with a poorer quality of life because some women may be denied ownership of family property/income, and some are exposed to social inequities that affect their overall access to care, health status, and quality of life(URT, 2003).

STRENGTHS AND LIMITATIONS OF THE STUDY

The study is limited by the cross-sectional design that does not allow assessment of the causal/temporal relationship between HI and health-related quality of life. Furthermore, we did not adjust for other confounders of HRQoL, such as family size and occupation, because these were not captured from respondents. Nevertheless, the strength of the study lies in the multistage sampling design that allowed a large sample size to be included in the study. Moreover, the sampling design promoted gender representation in the sample and equal rural-urban representation of the elderly in the study. In addition, we increased the number of respondents to address the non-response rate, which would have decreased the validity of the study findings.

CONCLUSION AND RECOMMENDATIONS

Although our findings indicate almost similar HRQoL between elderly with HI and those without HI, mostly due to adverse selection, in general, HI may contribute to improvement in HRQoL for the elderly. The findings provide insight for policymakers in Tanzania and other LMICs to prioritize universal HI through mandatory health insurance (with government subsidy for the poorest) for all citizens and residents to allow cross-subsidization by risk of illness and ability to pay. UHI will cover vulnerable sub-populations

like the elderly, who are more likely to face health issues as they age and are likely to not access healthcare services due to inequitable financial capacity and social support systems. Expansion of HI coverage may reduce the risk of catastrophic medical expenditure due to out-of-pocket payments and improve health care access and health status to achieve universal health coverage. Further studies may be conducted to assess the impact of mandatory UHI on HRQoL among the elderly population.

Abbreviations

CHF	Community Health Fund
CI	Confidence Interval
HI	Health Insurance
HRQoL	Health-related Quality of Life
iCHF	Improved Community Health Fund
KMO	Kaiser–Meyer–Olkin
LMICs	Low and Middle-Income Countries
NBS	National Bureau of Statistics
NHIF	National Health Insurance Fund
OOP	Out-of-Pocket
PCA	Principal Components Analysis
UHI	Universal Health Insurance
VAS	Visual Analogue Scale

Ethics and consent

Ethical clearance was obtained from the Muhimbili University of Health and Allied Sciences research review board in May 2018 (reference number 2018-05-24/AEC/Vol.XII/70). Permission for field data collection was granted by the District Executive Directors of Igunga and Nzega districts. Prior to the survey, individual written consent was obtained from the participants, while verbal consent was obtained from the participants who could not read and write. All the participants were fully informed about the research and their rights to participate or withdraw from the study.

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Author contributions

MT and PJA participated in data collection. MT, PJA and HS participated in the design, analysis and draft the manuscript. All the authors read and approved the final manuscript.

Disclosure statement

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