



Lifestyle Factors Influencing Falls among Older People in Central Kenya

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Abstract

An estimated one-third of the older people worldwide sustain falls every year, which contributes to over 20% of injuries in this age group. In the central region of (Mount) Kenya, despite increasing awareness about this condition, the magnitude as well as the socio-demographic and lifestyle factors leading to falls in the older people are not well known. The main objective of this study was to investigate the prevalence of falls, their outcomes, and the factors influencing their occurrence among older persons aged 65 years and above living in Gatanga Sub-County, Murang'a County, central Kenya. An analytical cross-sectional study design was used. Using systematic random sampling, 403 out of 9247 study participants were identified and interviewed at home. Using a structured interview form, data was collected on socio-demographic, socio-economic, lifestyle, and medical factors, as well as on fall or non-fall status from September 2016 to August 2017. Proportions were used to evaluate the occurrence of falls, lifestyle factors and medical conditions. Pearson's Chi square and logistic regression were used to evaluate associations between lifestyle and medical exposures and falls outcomes. With 41%, the prevalence of falls amongst the older people in this region is high. The farming lifestyle involving animal husbandry and medical illnesses are significantly associated with falls. To reduce the occurrence of falls, we need to integrate relevant preventive measures that reduce the risk of falls in communities of the older people in Central Kenya.

Keywords: Africa; falls; fractures; injuries; Kenya; Older people.

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1. Introduction

A fall is a form of unintentional injury and one of the external causes of morbidity and mortality. In the International Classification of Disease-11 (ICD-11), unintentional falls on the same level or from less than height of one meter are coded as PA60 [1]. A fall is usually defined [2] as “inadvertently coming to rest on the ground, floor, or other lower level, excluding intentional change in position to rest on furniture, wall, or other objects.” It is estimated that on a global level, approximately one third of older people aged 65 years and above fall each year. Studies across Europe [3], the Middle East [4], and Africa [5, 6] show fall rates ranging between 20 and 40%. In Kenya, falls are a significant cause of injuries among older people. A study [7] in the Kenyatta National Hospital, the largest referral hospital in Kenya, showed that falls were a leading cause of trauma and hospitalization among the older people aged over 60 years, with a frequency of 41.4%. Among the fall, 75% were due to falls on the same level. Falls were also cited [8] as a leading cause of domestic injuries among the older people aged over 55 years seen in health facilities in Nairobi area, Kenya, contributing to 69% of the injuries. A trauma-related mortality study in Western Kenya showed that falls were a leading cause of deaths, especially among females. Mostly affected (88%) were older people aged over 65 years, and sustained broken limbs, back, neck or pelvis, hence complications leading to death [9]. Other consequences of falls include admission into nursing homes, depression, immobilization, loss of autonomy, abandonment of daily activities, isolation, head injuries, confusion and fear of falling [10, 11, 12]. The economic and social burdens arising from falls are also high [13, 14]. Falls occur due to complex interactions of biological, demographic, physical, and environmental factors. Old age, female gender [15], chronic medical conditions [16], unfavorable socio-economic factors such as limited access to health services, illiteracy, poor housing, and low income are associated with an increased risk of falls [17]. Environmental factors such as slippery floors, staircases, and reduced lighting are also associated with an increased risk of fall [18]. Identifying the modifiable risk factors and developing culturally appropriate and effective evidence-based fall prevention methods can significantly reduce morbidity and mortality from falls in the older people [2, 19, 20]. The availability of data on occurrence and risk factors of falls among community dwelling older people in the Sub-Saharan Africa is extremely limited as majority of reports are based on poorly compiled hospital records [21]. This has hindered proper understanding of the magnitude of falls and their specific causative factors in these communities which hinder prevention efforts. Gatanga Sub-County, Murang’a County, is located in the mountainous central region of Kenya (Mount Kenya region) and covers an area of 599 km² (square kilometers). The majority of the people living in this area are of Kikuyu ethnicity and engage in a farming lifestyle, involving crop farming and rearing of domestic animals [22]. Animal husbandry is hypothesized to lead to a higher incidence of falls in this area yet previous literature has not elucidated its influence on falls. This study had the following specific objectives: 1) To establish the prevalence of falls, their characteristics, associated complications, and circumstances of their occurrence among the older persons living in the Gatanga Sub-County of Central Kenya, 2) to assess the socio-demographic, lifestyle, socio-economic, and medical factors of the older people, and establish their association with falls.

2. Materials and Methods

2.1 Study design

A community-based cross-sectional study was conducted from September 4th to 15th, 2017, in Gatanga Sub-County, Murang'a County to investigate the prevalence of falls in the community dwelling older people and their associated risk factors and complications.

2.2 Sample size and sampling

The following formula [23] was used for estimating the sample size: $n = \frac{Z^2 P(1-P)}{d^2}$ (1)

where n is the sample size, Z (1.96) is the statistic corresponding to 95% level of confidence, P (50%) is expected prevalence, and d (0.05) is precision. A sample of 384 was arrived at and inflated to 422, assuming a non-response rate of 10%. From the existing records of households in the area, a total of 6,127 potential households were identified where older persons resided. The estimated number of older people in Gatanga Sub-County was 9,247 [24]. Using systematic random sampling, households where interviews would be conducted were selected. The first household to be interviewed was selected using simple random sampling from the 1st 15 households in the area. Interviewers were required to move in one direction, systematically starting from the main street of their study area. On encounter with a selected household, the interviewer, a local CHW, administered the inclusion and exclusion criteria. In case of more than one eligible member, a one-shilling coin was tossed with males as head and females as tail to select the member to be interviewed. If an eligible member was not present in a household during the initial visit, the interviewer was required to revisit the household at a later time or date to undertake the interview. If a household did not have an eligible member based on the inclusion and exclusion criteria, the next household with an eligible member on the sampling list was selected.

2.3 Inclusion and exclusion criteria

Those included in the study were older people aged 65 years and above and those who were Residents of Gatanga Sub-County for the last year as these were the target population for the study. Excluded from the study were older people with physical disabilities limiting the use of both feet for walking and the use of arms for support, occurring before the preceding year and persons not able to give information due to severe mental incapacitation. Disability limited their ability to walk hence falling thus recruiting disabled individuals would result in bias while mental incapacitation would result in wrongful information. These characteristics were assessed prior to undertaking the main interview. An eligible participant was assessed on the correct orientation of time, place, and person and on the ability to undertake general activities of daily living such as self-feeding, self-bathroom care, self-grooming, and maintaining a 'normal' interaction and conversation with close contacts and interviewer. Collaborative information (where applicable) on mental history, specifically bizarre behavior, was briefly sought from persons who were closely associated with the study participant. In other cases, the Community Health Workers (CHW) used their knowledge of participants based on past interactions with the participants. The CHWs were trained volunteers from their respective communities where they participated in the delivery of primary health care services.

2.4 Variables

The main outcome variable for this study was a reported fall in the preceding year, from September 2016 to August 2017. A fall was defined as any sudden unintentional coming to rest from a level ground with or without loss of consciousness, excluding falls from heights, falls involving bicycles, motorcycles, and vehicles, and falls due to direct aggressive push by farm animals such as cows, donkeys, and goats. Study participants were asked whether they had sustained a fall in the preceding one year. Further information collected included the number of fall events sustained, time and place of last fall, whether accompanied by someone or not during the fall, and the immediate circumstances leading to the fall. Complications of falls included immobilization, fear of falling, abandonment of daily activities, loss of autonomy, hospitalization, and associated injuries such as skin bruises, fractures, head injury, and confusion. Exposure variables were collected on socio-demographic characteristics including age, gender, marital status, education level, and medical factors as these were hypothesized to contribute to falls. Majority of elderly persons were known to be on follow-up in the local hospitals on treatment for chronic illnesses and these illnesses were thought to contribute to falls in this community. Information on medical risk factors for falls collected included current use of medications, alcohol consumption, cigarette smoking, undergoing current treatment for certain illnesses such as diabetes, hypertension, heart disease, kidney disease, joints pains, lower back pains, recent or recurrent syncope, cancer, stroke, anemia, depressed mood and acute stress, headache, peripheral neuropathy, wounds and pressure sores, bruises and cuts, recent acute illnesses, and altered mental states were considered. Foot problems also investigated included foot pains and infestation with jiggers. The frailty of older people as a cause of falls was established using the Frailty for Non-Disabled index questionnaire [25] (Appendix 1(B)), unsteadiness in gait/problems with walking or balance, and difficulty in doing usual activities. Frailty is well known to contribute to falls. Malnutrition as a possible cause of falls among the older people was evaluated using a Mini Nutrition Assessment – Short Form (MNA-SF) (Appendix 1(C)), which is frequently used [26, 27]. Social-economic, lifestyle and environmental factors were investigated where variables included the type of floor of the residential house, source of lighting at night, living alone or with someone, involvement in daily activities, attending to domestic animals, and source of funds to cater for healthcare expenditure.

2.5 Data collection

Seventeen Community Health Workers (CHW) were trained to administer the structured interview forms at the study participants home (Appendix 1). The CHWs were recruited from their area of jurisdiction since they were previously involved in delivering primary healthcare services to their community members and had a good understanding of their localities. The data sources included the study participants, their caretakers, and past health records.

2.6 Statistical methods and data analysis

Statistical analysis was done using the statistical Software Package STATA 13.0 (StataCorp, College Station, Texas). Occurrence of socio-demographic, lifestyle and medical factors associated with falls were computed and reported as percent proportions of the collected data. For significance testing in bivariate analysis, Pearson's Chi (χ^2) Square Test was used for categorical variables, and $p < 0.05$ was considered statistically significant [28]. Subsequently, those variables statistically significant (p -value < 0.05) in the bivariate analysis were entered into

a multivariate logistic regression model to evaluate the independent associations between falls and characteristics of the participants. The results of the regression model are presented as odds ratios (OR) with their 95% confidence intervals (95% CI) [29].

2.7 Ethical considerations

The research protocol (ref. KEMRI/SERU/CPHR/09/3509) was approved by the Scientific and Ethical Review Unit (SERU) of the Kenya Medical Research Institute on the 21th of August 2017 [30]. The written informed consent form is outlined in the Appendix 2.

3. Results

3.1 Participation

For this study, 422 participants were selected for interviewing; analysis was performed for 403 participants. Non response rate was 4.5% with 19 participants being excluded for failing to give informed consent (11 participants) and data collected that did not meet inclusion criteria (8 participants).

3.2 Socio- demographic and lifestyle characteristics of the older people with their corresponding bivariate associations with falls

The socio-demographic and lifestyle characteristics of the study participants were computed using proportions. Using Pearson's Chi (χ^2) square, gender, mode of payment of hospital bills and rearing of sheep and goats were significantly associated with falls as shown in table 1.

Table 1: Socio-demographic, lifestyle and socio-economic characteristics of study participants and the bivariate associations with falls.

Socio-demographic risk factors	Response	Count, n (Total N = 403)	Proportion (%)	<i>p value</i>
Age groups	65-74	209	51.2	0.490
	75-84	119	29.5	
	85-103	75	18.6	
Gender	Female	285	71.0	0.048
	Male	118	29.0	
Marital status	Married	242	60.2	0.086
	Divorced/widowed	139	34.6	
	Never married	21	5.2	
Education level	No school	204	50.6	0.213
	Primary school not completed	102	25.3	
	Primary school completed	69	17.1	
	Secondary Completed	28	7.0	
Payment of hospitalization bills	Own cash/health insurance	244	61.6	0.008
	Relatives/well-wishers contribution	152	38.4	
Sheep/goats rearing	Yes	27	6.7	0.012
	No	375	93.3	

3.3 Medical factors of the older people and their bivariate associations with falls

Medical and physical factors which were significantly associated with the falls in the bivariate (with Pearson's Chi (χ^2) Square) analysis are listed in Table 2.

Table 2: Medical risk factors of the older people and their bivariate associations with falls.

Medical Risk factor	No. with a risk factor (Total N = 403)	Proportion (%) of participants with a risk factor	<i>p value</i>
Frailty for Non-disabled (FiNd) Index (disabled or frail)	266	66.3	0.000
Peripheral neuropathy	259	64.3	0.014
Arthritis/Joint pains	267	62.9	0.011
Knee arthritis	138	48.0	0.006
Hip arthritis	103	25.8	0.000
Ankle arthritis	102	25.5	0.003
Lower back pain	214	53.4	0.000
Current medication use	203	50.5	0.001
Difficulty in doing usual activities	203	50.4	0.009
Headache	187	46.6	0.001
Dizziness	177	44.0	0.000
Memory loss	177	44.0	0.007
Hypertension	173	42.9	0.007
Unsteadiness in gait/ problems with walking or balance	171	42.4	0.000
Assistive walking device use	124	30.7	0.001
Acute illness	126	31.4	0.000
Hospital admission	96	23.9	0.008
Bruises and cuts	68	16.9	0.035
Diabetes	42	10.4	0.001
Syncope	38	9.4	0.000
Blindness	32	8.0	0.013

3.4 Fall associations in the multivariate analysis

Factors which were significantly associated with the falls in the bivariate analysis (p value < 0.05) model as listed in Table 2 (see above) were advanced in a multivariate analysis model (logistic regression) to evaluate independent associations for risk of fall and are listed in Table 3.

3.5 Prevalence, characteristics, outcomes, and circumstances of falls

The prevalence rate of falls for the period of study, September 2016 to August 2017, was 41.4% (CI 36.7 - 46.3%). In relation to gender, 44.7% of females and 33.9% of males had sustained a fall during the study period. The characteristics of the falls investigated showed that the majority of fallers (65.1%) had recurrent falls. Most falls occurred in the outdoors (79.7%) and during daytime (79.0%), especially in the morning hours. The majority of the fallers (57.6%) reported to have fallen on a flat surface.

The outcomes of the falls as reported by the 167 fallers are listed in Table 4.

Table 3: Factors which were significantly associated with the falls in the multivariate analysis.

Positively associated factors	Odds Ratios (95% CI)
Rearing sheep	117.9 (19.0 - 710.0)
Blindness	31 (7.9 – 129.9)
Diabetes	9.3 (2.7 – 31.8)
Syncope	8.6 (2.5 – 29.9)
Frailty Index for Disabled questionnaire (being frail or disabled)	8.1 (5.7 – 11.5)
Bruises and cuts	7.9 (3.3 – 18.3)
Female gender	6.6 (3.3 – 13.1)
Difficulty in carrying out usual activities	4.0 (2.1 – 7.7)
Low back pains	3.5 (1.9 – 6.5)
Arthritis	3.3 (1.7 – 6.1)
Current medications use	3.2 (1.8 – 5.9)
Memory loss	2.8 (1.6 – 5.1)
Use of assistive walking devices	2.0 (1.4 – 2.9)

Table 4: Outcomes of falls.

Outcomes of falls	No. of participants with an outcome (N = 167)	Proportion (%) of outcome among fallers
Fear of falling	153	91.6
Injury after fall	83	49.7
Abandonment of daily activities	67	40.1
Loss of autonomy	57	34.1
Hospitalization	52	31.1
Immobilization	49	29.3
Fractures	41	24.6
Fractured tibia	16	9.6
Fractured femur	9	5.4
Fractured radius-ulna	7	4.2
Fractured hip	5	3.0
Fractured humerus	4	2.4
Hip dislocation	2	1.2
Skin bruises	31	18.6
Confusion	21	12.3
Head injury	19	11.4
Black out	18	10.8

The participants reported various circumstances leading to falls as outlined in Figure 1. These included walking (40.0%), sliding (8.4%), fell while working (7.7%), felt dizzy then fell (7.7%), postural change (7.1%), tripped over goats while attending to them (5.2%), under influence of alcohol (5.2%), tripped over an object (3.9%), missed a step (3.2%), lost balance, lost perception of a place while in darkness, delirium like states, tremors, loss of energy, and ankle twist.

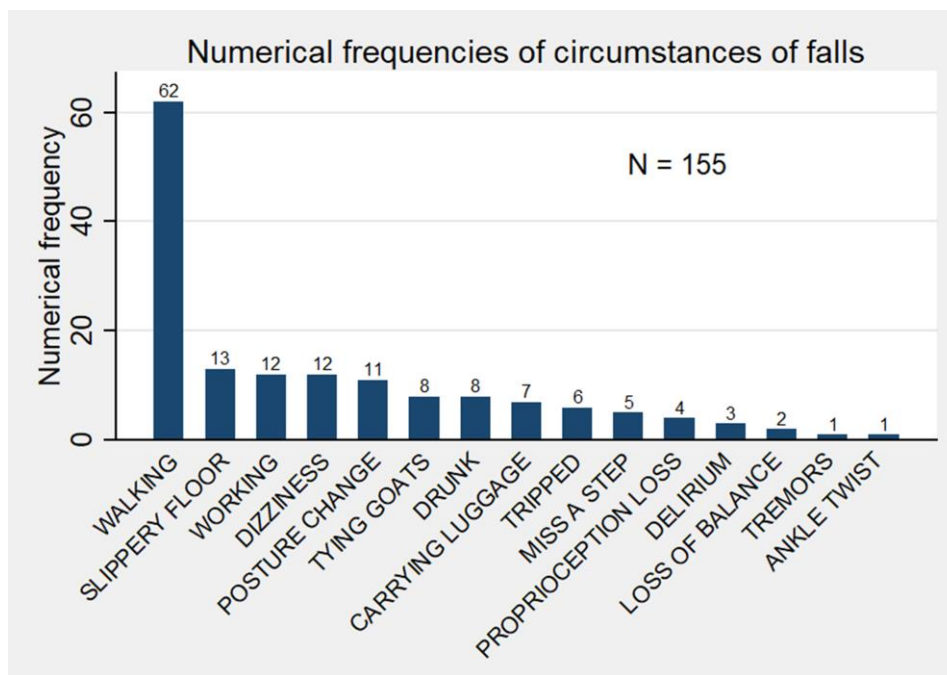


Figure 1: Numerical frequencies of circumstances of falls

4. Discussion

This study investigated the occurrence of falls amongst the older people in the Gatanga region of Central Kenya in the context of their socio-demographic, lifestyle, and medical influences. The results show that the interaction of these factors is likely to have a significant influence on falls in this age group. Understanding the root causes of falls in this population will provide potential areas to address when establishing suitable fall prevention measures. In this study, the prevalence of falls was 41.4% (CI 36.9 – 46.2), which is relatively high and consistent with other studies in different places of Africa and the world, showing a fall prevalence of 20-60% [6, 20, 21, 31]. The introduction of robust fall prevention measures would likely reduce this prevalence. Socio-demographic, cultural, and lifestyle factors, such as engagement in sheep rearing, were significantly associated with falls. The interaction between older people and domestic animals was identified as a potential risk factor for falls in this community. Nine study participants reported to have fallen while attending to sheep or goats, having been pulled or suddenly tripped over their tethering ropes (Figure 1). Other older people reported to have fallen while carrying fodder on the farms and when going to the farms. This shows that the farming lifestyle of older people in this region is a contributor to falls. Previous studies have not shown this association between the farming lifestyle and falls. Other factors which were significantly associated with the falls in this population included being female, on current medication use, lower back pain, memory loss, diabetes, syncope/fainting,

blindness, arthritis, difficulty in carrying out usual activities, being frail as measured in the Frailty for non-disabled index tool, using assistive walking devices, and having bruises/cuts. Other studies have already shown association of falls with these physical and medical factors thus understanding their influence on occurrence of falls in the background of cultural factors is paramount to implementing an effective falls prevention strategy.

4.1 Generalizability

The socio-demographics and lifestyles of the older people in the central region of Kenya are generally similar. The region is mountainous and inhabited by people of the Kikuyu ethnicity, who mainly engage in crop and animal farming. An informal survey of older people admitted with fractures in the different hospitals in the region showed similar causes of fall-related injuries, including being female, tripping over goats, sliding on a wet surface, sustaining falls while walking or carrying farm materials, and other etiologies as elaborated in the discussion and shown in Figure 1. Thus, the findings of this study are likely to apply to other areas of central (Mount) Kenya.

4.2 Conclusions

The World Health Organization Fall Prevention Model [20] recognizes the pillars of preventing falls as: (1) awareness building, (2) individual assessment of environmental and societal factors that increase the likelihood of falls, and 3) facilitating the design and implementation of culturally appropriate evidence-based interventions that will significantly reduce the number of falls among older persons. Animal husbandry and medical illnesses were identified as significant contributors to falls in this region. Ideal fall prevention methods in this community needs to target older people and their care givers with relevant fall prevention messages which reduce exposure to the identified risk factors and health workers dealing with older persons to sensitize them on the need to assess, treat and advise them appropriately on their individual risk of falls. Older people were found to have a higher burden of diseases that are likely to make them prone to falling. Access to quality healthcare services should be made easier for them to ensure that they seek early medical intervention for these chronic illnesses to prevent falls, severe injuries, and incapacitation.

4.3 Limitations

Despite attempts to collect information which represented the true health status of the older people, there were limitations which could have interfered with the internal validity of the results, including challenges with memory, and indeed, 43.8% of the participants had memory loss. Hence, the cross-section design of the study where we measured exposure and outcome variables at the same time could result in some level of bias, possibly understating the frequency of fall episodes. However, a study in Brazil tested the agreement between the self-reported method after 12 months versus the prospective method and found that the global agreement was 79% for falls and 89% for recurrent falls [32]. This shows that the self-report method at 12 months has a capacity to provide fairly reliable information to derive reliable estimates. However, caution is required when using such methods to investigate the epidemiology of falls. Second, the establishment of the true illness status in some conditions was sometimes difficult due to insufficient medical records and medications. However, several

methods were used to address this. The participants had to provide medications they were currently on and hospital records for the past year such as prescriptions and visit cards at the time of the interview. Collaborative information was sourced from close family members and close contacts to ascertain treatment for illnesses as described by the older people. While most of our study participants had either of these information sources, there was still a chance of misclassification bias. The establishment of the true mental status among the older people may have lacked precision because of a lack of a validated tool to use in a largely illiterate population. However various methods were used to ensure optimum validity as outlined in the inclusion and exclusion criteria. The cross-section design of our study could not prove the temporal direction of association between some exposure variables and the outcomes; wounds and syncope would have occurred due to falls. Besides it could not be used to estimate the incidence of falls which would have best been addressed in a prospective cohort design. This occurred due to limitations in funding and time to conduct the study, among other logistical challenges. However, the cross-section design revealed key information on occurrence of falls and possible risk factors in this community which would be useful in raising awareness and when designing comprehensive studies on the subject in this region.

4.4 Recommendations

This study shows that falls are a significant cause of morbidity among elderly persons living in Central Kenya. To reduce the burden of falls among the elderly persons, the following recommendations are made; (1) There's need to research on ideal fall prevention methods in this population. These methods ought to be culturally appropriate and acceptable among the elderly persons. (2) Mobilize financial and human resources to target fall prevention efforts in these communities. The resources would be used to promote fall prevention activities among elderly persons in Central Kenya. (3) Develop strategies to increase accessibility to healthcare among elderly persons. This would help lower the burden of chronic diseases among the elderly which would likely lower the risk factors for falls among the elderly.

4.5 Declaration of Conflicting Interests

The authors declare that there is no conflict of interest.

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Appendix

Appendix 1: Falls among the older people. Study Interview form with Kikuyu Translation.

S1 Appendix 1. Interview form Falls elderly Study with Kikuyu Translation

Guidelines

To be eligible for the interview, a participant must fulfill the following criteria,

1. Must be 65 years and above as per the date of the interview.
2. Must be a resident of Gatanga sub-county in the last 1 year.
3. Must have no physical disability limiting walking using both legs or limiting use of arms to enhance balance and support while walking.
4. Must have good mental state as defined by correctly identifying the present time of the day, physical location where one is and themselves by at least two names. Must also be able to undertake activities such as self-feeding, self-bathroom and self-grooming. Must also be known to maintain a 'normal' interaction with close contacts and interviewer and devoid of bizarre behavior.

If a study participant meets the above criteria, proceed with the interview as below.

I. Questionnaire Number (*Namba ya fomu*) _____

II. Participants initials (*Mariitwa ma Muihuria*) _____

III. Phone (*Namba ya thimu*) _____

2.

3. Part I: Biodata

IV. Year of birth (*mwaka wa guciarwo*) _____

V. Sex: M (*Mundurume*) / F (*Mutumia*)

VI. Residence Village (*itura*) _____

VII. Marital Status (*Uhikania*) (**Select one**)

0. Never married (*Nduri wa hika*)

1. Married (*Muhiku*)

2. Widowed / Divorced (*Muthuri /Mutumia gukua*)

VIII. Highest Level of education attained (*Githomo Kinene*) (**Select one**)

0. No school (*Nduri wathie shukuru*)

1. Primary not completed (*Kuthoma kia primary/mbere*)

2. Primary completed (*kurikia primary/kia mbere*)

3. Secondary completed (*Kurikia gia secondary/ gia keri*)

4. Tertiary (*Kuthoma gia college kana university*)

5. Technical course (*Kothi*)(specify)_____

Part II: Medical Status

IX. Have you sought medical care for any of the following conditions in the last 12 MONTHS? (*Niuri warigitwo niundu wa mirimu ino?*) (**Tick Yes or NO for all responses/ circle duration as necessary**)

0. Diabetes (*Murimu wa cukari*) Y = 1 / N =0

4. Duration of illness (*kahinda ka murimu*) _____years (*miaka*) / months (*mieri*)

1. Hypertension (*thakame kuhaica*) Y = 1 / N =0

Duration _____ years / months

2. Heart Disease (*Murimu wa ngoro*) Y = 1 / N =0

5. Duration _____ years / months

3. Lung disease (*murimu wa mahuri*) Y = 1 / N =0

6. Duration _____ years / months

4. Kidney disease (*murimu wa higo*) Y = 1 / N =0

7. Duration _____ years / months
5. Arthritis/ Joint pains (*Ruo rwa marungo*) Y = 1 / N =0
8. **(Circle as necessary)**
 - i) Hip (*njohero*) ii) Knees (*iru*) iii) Ankle (*thungw'a*) iv) Foot pains (*ruo rwa ikinya*)
 - (v) wrist () (vi) fingers (*Ciara cia moko*) (vii) elbow (*kigokora*) (viii) shoulder (*kiande*)
 - ii) Duration _____ years / months
6. Lower Back pain (*Guturwo ni mugongo*) Y = 1 / N =0
9. Duration _____ years / months
7. Neck pains (*guturwo ni ngingo*) Y = 1 / N =0
10. Duration _____ years / months
8. Syncope (*kuringika*) Y = 1 / N =0
11. How many times _____
9. Dizziness (*kuigua thiorora*) Y = 1 / N =0
12. Duration _____ years / months
10. Anemia (*kwaga thakame*) Y = 1 / N =0
11. Headache (*guturwo ni mutwe*) Y = 1 / N =0
12. Altered Mental States /dementia (*kwirigwo*) Y = 1 / N =0
13. Duration _____ years / months
13. Acute stress / depressed mood (*gwiciria muno/kwaga gikeno*) Y = 1 / N =0
14. Duration _____ years / months
14. Memory loss (*kuriganirwo muno*) Y = 1 / N =0
15. Duration _____ years / months
15. Stroke (*Murimu wa kuoja mwiri*) Y = 1 / N =0
16. Duration _____ years / months

16. Fractures (*kuuneka mahindi*) Y = 1 / N =0
 1. Type(*Mariku*)__i) ankle (*thungw'a*) (ii) leg (*muthirimo*) (iii) femur (*ihindi ria kiero*) (iv) hip(*njohero*) (v) forearm (*guoko*) (vi) humerus (*guoko gwa thutha*)
 17. (vii) others (*kuuneka kungi*) _____
 2. When (*mwaka uriku*) _____
 3. Cause (*niki wekire*) _____
17. Visual impairment- reduced vision (*kwaga kuona wega*) Y = 1 / N =0
18. Duration _____ years / months
19. Glasses (*niuhuthagira miwani*) Y = 1 / N =0
18. Blindness (*kuura maitho*) Y = 1/ N =0
20. i) One eye (*ritho rimwe*) ii) both eyes (*maitho meri*)
21. Duration _____ years / months
19. Hearing impairment (*murimu wa kwaga kuigwa*) Y = 1 / N =0
22. i) Partial (*njiguaga o-hanini*) ii) complete (*ndiguaga*)
23. Duration _____ years / months
20. Peripheral Neuropathy (*kuganda /guturwo ni maguru kana moko*) Y = 1 / N =0
24. Duration _____ years / months
21. Jiggers (*Ndutu*) Y = 1 / N =0
22. Bruises and cuts (*kuumira / gutihio*) Y = 1 / N =0
25. Triggering event/ cause (*niki wekaga*) _____
23. Wounds / pressure sores (*ironda*) Y = 1/ N =0
26. Location – specific (*ironda ku*) _____
27. Duration _____ years / months
24. Cancer (*kanja*) Y = 1 / N =0
28. Location _____
29. Duration _____ years / months

25. Unsteadiness in gait / problems with walking or balance (*kuremwo ni guthii kana kurugama wi murungaru*) Y = 1 / N =0

30. Duration _____ years / months

26. Difficulty in carrying our usual activities? (*kuremwo ni kuruta wira wa mucini*) Y = 1 / N =0

31. Duration _____ years / months

27. Acute illness (*kurwara muno*) Y = 1 / N =0

32. Specify the nature of illness (*murimu uriku*) _____

33. Duration _____ years / months

28. Hospital admission (*gukoma thibitari*) Y = 1 / N =0

34. Duration (months) _____

35. Treatment type (*kurigitwo atia*) (**circle as necessary**)

36. i) Medications (*kuheo dawa*)

ii) Major surgery (*Guthijwo muno*) _____

iii) Minor surgery/ invasive diagnostic procedures (*Guthijwo hanini*) _____

29. Others (*Thina ungi wa mwiri*) Y = 1 / N =0

37.

38.

X. Are you currently on any medication / drugs? (*He na dawa uranyua?*) Y = 1 / N = 0

XI. If YES(Y) in X above, for what Illness (es) (*dawa cia mirimu iriku*) _____?

Table 5

Illness (<i>mirimu</i>)	Number of meds (<i>mithemba iigana ya ndawa</i>)	List of medications (<i>dawa</i>)

- XII. Do you consume Alcohol Y = 1 / N = 0 (*Ni-unyuaga njohi?*)
- XIII. If Yes(Y) in part (XII). What kind of alcohol drinker are you? (*Wi munyui wa githemba kiriku?*)
39. 1. Alcohol type (*Njohi iriku* _____)
40. 2. How many days per month (*Okorwo ni unyuaga-ri, mithenya igana kwa mweri?*)

41. 3. How many bottles/glasses per sitting (*shufa/ gilathi/ikobe cigana rita?*)

42. 4. How many years (*Miaka igana?*) _____
43. Other information on alcohol use (*Uhoro ungi wa kunyua njohi*) _____

- XIV. Smoking cigarettes (*Ni – uhuthagira thigara?*) Y = 1 / N = 0
- XV. If yes in (XIV). What kind of smoker are you? (*Wi muhuthiri wa thigara atia?*)
1. How many sticks per day? (*Ciigana muthenya?*) _____
2. For how long in years (*kahinda kaigana atia?*) _____
3. Other information on cigarettes use (*uhoro ungi wa munyuire wa thigara*) _____

- XVI. Do you use assistive walking devices? (*niuhuthagira indo ciaguthii*) (**Select one**)

0. None (*ndihuthagira*) ☐
1. Walking stick (*mutirima*) ☐
2. Walking frame (*ringa ya guthii*) ☐
3. Clutches (*miti ya guthii/macerega*) ☐
4. Wheel Chair (*Giti gia guthii*) ☐
5. Other (*kindu kingi*) _____

Duration (years/months) _____

44. Part III: Socio--cultural-economic factors

- XVII. What is the type of floor of the house you live in? (*Thi ya nyumba iria wiikaraga ithondeketwo naki?*)
(**Select one**)

0. Earth (*Tiri*) ☐
1. Cement (*Guthimindwo*) ☐
2. Tiles (*Maturufari*) ☐
3. Other _____

- XVIII. What is the main source of lighting in the house at night? (*Niki uhuthagira utherini wa nyumba utuku?*)
(**Select one**)

0. Kerosene Lamp (*tawa wa maguta*) ☐
1. Candle (*mushumaa*) ☐
2. Electricity (*thitima*) ☐
3. Other _____

- XIX. Whom do you live with mainly? (*muikaraga nau mucii kaingi?*) (**Select one**)

☐

0. Close family member (*mundu wa mucii*)
 i) wife/ husband (*mutumia/muthuri*) ii) Child (*mwana*)(iii) brother / sister (*mwanake/muiritu muciaraniirwo nake*) (iv) Other _____

1. Employed person (*mundu wa kwandikwo*) ☐

i) Daytime only person

ii) Day & Night person

2. Alone (*winyika*) ☐

3. Other _____

XX. Presence of domestic animals (*Niukoragwo na mahiu mucini?*) (Select as appropriate)

0. None (*hatiri*) ☐

1. Goats (*mburi*) ☐

2. Sheep (*ngondu*) ☐

3. Cows (*ngombe*) ☐

4. Chicken (*nguku*) ☐

5. Others _____

XXI. What activities do you engage in on day to day basis? (*nikii wikaga*)

0. No Activity (*guikara*) ☐

1. Crop farming (*urimi*) ☐

2. Animal husbandry (*urimi wa mahiu*) ☐

3. Business (*biashara*) ☐

4. House Chores e.g. washing, cooking (*wira wa kiimucie*) ☐

5. Others(specify) (*mangi*) _____

XXII. Do you consume at least 3 meals daily (breakfast, lunch, dinner) (*Niuriaga maita matatu o-muthenya? –kiroko, muthenya, na hua-ini?*) (Select only one)

0. Never (*aca*)

1. Some of the weekdays (*rimwe na rimwe*)

2. Most of the weekdays (*kaingi*)

3. All of the weekdays (*ni ndiaga o-muthenya maita matatu*)

XXIII. If Option 0 and 1 are given, what are the reasons? (*Niki gitumi gia kwaga kuria wega?*) (Select One)

0. Cannot cook (*ndingihota/ndioe kuruga*)

1. Lack of food to cook. (*niundu wa kuaga irio*)

2. Have food but lack someone to cook (*ningoragwo na irio no ndionaga mundu wa ku dugira*)

3. Lack of appetite due to illness or otherwise (*kuremwo ni kuria*)

4. Other _____

XXIV. If you get sick, how do you normally pay your treatment and hospital bills? (*Riria wa rwara ri, urihaga marihi ma thibitari atia?*)

0. Own Cash (*Kwiyethera besha*)

1. Health insurance eg. NHIF or other _____ (*Mufango wa thirikari wa NHIF kana ungi*)

2. Relatives contribution (*Andu aitu makadeithya*)

3. Other _____

Part IV: Fall History

XXV. Have you ever fallen since you attained 65 years old? (*Kuma utwike mundu mukuru-ri niuri wagua?*)
Y = 1 / N = 0

45. If Yes, How many times? (*maita maigana*) _____

XXVI. Have you fallen in the last 12 MONTHS? (*niuri wagwa mwaka ucio urathirire*) Y = 1 / N = 0

46. (If NO, proceed to the FiND questionnaire, MNA-SF)

XXVII. How many times did you fall in the last 12 MONTHS? (*Waguire maita maigana mwaka ucio urathirire*) (**Select One**)

- 0. Once (*rimwe*)
- 1. Twice (*maita meri*)
- 2. Thrice (*maita matatu*)
- 3. Four (*maita mana*)
- 4. More than four (*makiria ya maita mana*)

47. Other _____

XXVIII. Where did you fall in the last episode? (*waguire ku?*) (**Select one**)

- 0. Inside House (*thiini wa nyumba*) Y = 1 / N = 0
- 1. Within Compound but outside house (*ja wa nyumba*) Y = 1 / N = 0
- 2. In the garden (*muguda-ini*) Y = 1 / N = 0
- 3. Road (*farafaraini*) Y = 1 / N = 0
- 4. Other (specify) _____

XXIX. Terrain of fall (*haria waguire-ri haina-mite atia?*) (**select one**)

- 0 Flat (*hati-ari na kamwabato*)
- 1 Mildly steep (*kamwabato kanini*)
- 2 Very Steep (*kamwabato kanene*)

XXX. What were the outcomes of the fall? (*wagwa-ri wumirire/ kuguthwo ku?*) (**Select as appropriate**)

- 0. Injury (*Niwoomirire?*) Y = 1 / N = 0
- 1. Do you know why you fell (*Niue gitumi gia kugua?*) Y = 1 / N = 0
- 2. Blackout on falling (*kuringika wagua?*) Y = 1 / N = 0
- 3. Head Injury (*mutwe*) Y = 1 / N = 0
- 4. Fracture (specify) (*kuunika mahindi mariku*) Y = 1 / N = 0
- i) Femur / thigh bone (*ihindi ria kiero*) RIGHT (*urio*) / LEFT (*umotho*)

- ii) Tibia / leg bone (*muthirimo*) RIGHT / LEFT
- iii) Radius-ulna / forearm (*Mahindi ria guoko kwa bere*) RIGHT / LEFT
- iv) Humerus /upper arm (*mahindi ma guoko gwa thuta*) RIGHT / LEFT
- v) Hip injury/ (*Njohero*) RIGHT / LEFT
- vi) Others _____
- 5. Skin bruises and lacerations (*iroda- ku?*) Y=1 / N=0 _____
- 6. Hospitalization (*guthii / gukoma thibitari*) Y = 1 / N = 0

- 48. Duration (Months) _____
- 49. Treatment type. (i) Operation (*guthijwo*) _____
- 50. (ii) Medications (*dawa*)

- 7. Fear of falling (*niwitigiraga kugua ringi*) Y = 1 / N = 0
- 8. Immobilization (*niwaremerwo ni guthiaga*) Y = 1 / N = 0
- 9. Abandonment of daily activities (*niwaremerwo ni kurutaga wira*) Y = 1 / N = 0
- 10. Loss of autonomy (*niwaremirwo ni gwiteithagia*) Y = 1 / N = 0
- 11. Confusion (*kuhingicika meeciria*) Y = 1 / N = 0
- 12. Others (*kuumira /kugi-ika kungi*) specify/atia) _____

XXXI. Were you accompanied by someone during fall? (*ukigwa-ri nimwari na mundu*)

51. Y = 1 / N = 0

XXXII. What time did you fall in your last fall episode? (*ukigwa-ri kwari tha cigana?*) (**select one**)

- 0. Morning(*rucini*) (5am-12noon)
- 1. Afternoon (*matha ma huaini*) (12noon-6 pm)
- 2. Early Evening (*gugituka*) (6pm – 10 pm)
- 3. Late Evening (*utuku*) (10pm – 5am)

XXXIII. What were the circumstances of fall/ why did you fall? (Immediate Pre and post-fall Events or activities involved in while falling. Fall triggering event, under influence of alcohol?) (*ukugwa-ri nikiwekaga,*)

52. _____

The Frail Non-Disabled (FiND) Questionnaire_Kikuyu Translation (Githimi kia hinya wa munda mukuru)**Table 6**

Domain	Questions	Answer	Score
<i>Disability</i>	A. Have you any difficulties at walking 400 meters? (<i>Niugiakaga guthii kuma haha nginya _____</i>)	a. No or some difficulties (<i>ndiri na thina / o hanini</i>)	0
		b. A lot of difficulties or unable (<i>Ngiakaga muno / ndingihota</i>)	1
	B. Have you had any difficulties at climbing up a flight of stairs? (<i>Niukoraguo na thina kwa bata ngathi</i>)	a. No or some difficulties (<i>aca / o hanini</i>)	0
		b. A lot of difficulties or unable (<i>Ngi e kaga muno / ndingi-hota</i>)	1
<i>Frailty</i>	C. During the last year, have you involuntarily lost more than 4.5 kg? (<i>Mwaka ucio urathirire niutete makiria ya kilo inya na nuthu</i>)	a. No (<i>aca</i>)	0
		b. Yes (<i>ii</i>)	1
	D. How often in the last week did you feel that everything you did was an effort or that you could not get going? (<i>Wiki iyo irathirire, ni uragi-ikaga gwika undu o wotha?</i>)	a. Rarely or sometimes (2 times or less/week) (<i>hanini kana rimwe na rimwe</i>)	0
		b. Often or almost always (3 or more times per week) (<i>kaingi / mahinda moothe</i>)	1
	E. Which is your level of physical activity? (<i>Niuhotaga kuruta wira</i>)	a. Regular physical activity (at least 2-4 hours per week) (<i>Ni ndutaga wira</i>)	0
		b. None or mainly sedentary (<i>aca / ndindaga njikarite thi</i>)	1

If $A+B \geq 1$, the individual is considered as "disabled".

If $A+B=0$ and $C+D+E \geq 1$, the individual is considered as "frail".

If $A+B+C+D+E=0$, the individual is considered as "robust".

Mini Nutritional Assessment – short form_Kikuyu Translation (Githimi kia murire wa munda mukuru)

Mini Nutritional Assessment – Kikuyu Translation

MNA[®]

**Nestlé
Nutrition Institute**

Weight, kg:	Height, cm:
Complete the screen by filling in the boxes with the appropriate numbers. Total the numbers for the final screening score.	
Screening	
A Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties? / Murire wa irio ni unyihite mieri itatu mithiru niudu wa kwaga kuigua kuria, thina wa guthia irio, kuremwo ni gutanuka kana kumeri? 0 = severe decrease in food intake / kuremwo ni kuria fiu 1 = moderate decrease in food intake / kuremwo ni kuria hanini 2 = no decrease in food intake / ndiaga wega	
B Weight loss during the last 3 months / Uritu wa mwiri mieri itatu mithiru 0 = weight loss greater than 3 kg (6.6 lbs) / gute uritu makiria ma kilo ithatu 1 = does not know / Ndioe 2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs) / gute uritu o hanini_ kilo imwe ginya ithatu 3 = no weight loss / ndire ndate kilo	
C Mobility / Mithiire 0 = bed or chair bound / njikaraga uriri-ini kana gitiini tu 1 = able to get out of bed / chair but does not go out / No nyume uriri-ini / gitiini no ndingitwaara nja 2 = goes out / ni thiaga nja	
D Has suffered psychological stress or acute disease in the past 3 months? / niukoretwo na thina wa meciiria /gwiciria muno kana kurwara muno mieri itatu mithiru 0 = yes 2 = no	
E Neuropsychological problems/ thina wa hakiri 0 = severe dementia or depression / gute/ kuhingicika meciiria/ hakiri fiu / kwirigirirwo fiu 1 = mild dementia / kwirigirirwo hanini 2 = no psychological problems / hatiri thina wa hakiri	
F1 Body Mass Index (BMI) (weight in kg) / (height in m) ² / Uritu wa mwiri 0 = BMI less than 19 1 = BMI 19 to less than 21 2 = BMI 21 to less than 23 3 = BMI 23 or greater	
IF BMI IS NOT AVAILABLE, REPLACE QUESTION F1 WITH QUESTION F2. DO NOT ANSWER QUESTION F2 IF QUESTION F1 IS ALREADY COMPLETED.	
F2 Calf circumference (CC) in cm / Utungu wa kuguru 0 = CC less than 31 3 = CC 31 or greater	
Screening score (max. 14 points)	
12-14 points: Normal nutritional status 8-11 points: At risk of malnutrition 0-7 points: Malnourished	

Ref. Vellas B, Villars H, Abellan G, et al. Overview of the MNA[®] - Its History and Challenges. J Nutr Health Aging 2006;10:456-465.
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 © Société des Produits Nestlé, S.A., Vevey, Switzerland, Trademark Owners
 © Nestlé, 1994, Revision 2009. N67200 12/99 10M
 For more information: www.mna-elderly.com

Figure 2

Appendix 2: Written consent form with Kikuyu Translation.

Informed Consent_with Kikuyu Translation

Ritwa Ria Mutaratara Uyu (Title): *Maundu maria matumaga andu akuru a Gatanga magwe* (Factors associated with falls among the elderly persons living in Gatanga Sub-county)

Mutwiria Munene (Principal Researcher): Kimani Ernest Ng'ang'a, Jomo Kenyatta University of Agriculture and Technology

Kuria mutaratara urekika (Location of study): Gatanga Subcounty, Muranga County

Gitumi kia mutaratara uyu (Purpose of research): *Kurora ni andu aigana akuru Maguire mwaka ucio wa hitukire (kana maguaga o mwaka) na itumi cia kugwa kwao na thina uria magiire marikia kugua* (To assess the prevalence of falls and factors associated with the falls among elderly persons.)

a) Mutaratara uria uhuana: *(Brief description of the proposed research as it will be experienced by the research participants. Interventions or procedures that are part of standard care and those that are research must be distinguished.)*

Kuringana na mutaratara uyu-ri, ni ukurio ciuria iria ugucokia na macokia macio mekwadikwo fomu-ini yaku ya mutaratara uyu. Ciuria icio ni cia mirimu iria ungikorwo nayo, hinya wa mwiri waku, mirire yaku, muikarire waku na kana niuri wagua. Ni uguthimwo uraihu, uritu waku, utungu wa kuguru gwaku.

b) Ithimi cia thakame kana indo cia mwiri waku. *(Specific testing (e.g. HIV testing, HLA typing) will be done as part of the research, this must be explained.)*

Gutiri thakame kana o kindu giothe kingionania murimu gikurutwo thi-ini wa mwiri waku kana ukwirwo uheane niguo githii gigathimwo.

c) Kuingirana / guthinia dawa iria ungikorwo ukinyua kana guthodekwo kimwiri *(Interference with ongoing therapies/treatments amongst study participants)*

Mutaratara uyu ndu-kuingirana kana guthinia mirimu o yothe ungikorwo ugithodekwo kana dawa ungikorwo ukinyua kana ugifanga kunyua.

d) Kufangwo mutarataraini uyu *(Need for randomization or sequential assignment is planned.)*

Ucaguritwo hatari umenyo o - wotho niguo oriu ciuria. Maritwa ma andu o the akuru a guku maria mena thirikari nimo mahuthirirwo gucagura andu aria me koriu ciuria. Hatiri mundu o-wothe woikaine niguo macaguruo.

e) Thakame kana indo cia mwiri waku kuhuthirwo *(Use of blood samples in this study, and other*

specimens (e.g. urine, stool, saliva etc)

53. *Gutire thakame kana mathugumo kana o kindu giothe kiumaga mwiri waku gikurutwo niguo githimwo.*

f) Kahinda ka mutaratara uyu (*The frequency and duration of specific testing, as well as the duration of the entire study*)

54. Mutaratara uyu ukuoya kahinda ka nuthu ithaa haria ugucokia ciuria na uthimwo uraihu na uritu waku. Gutiri maundu mangi kana ithimi ingi cikwendekana

g) Gucejio kana kuongererwo kwa uhoro wa mutaratara uyu (*Information dissemination to study participants on changes in the study or addition of new information*)

Hangikorwo undu o wothe ukwendekana gucejio ni ukwirwo. No tondu mutaratara uyu uroya kahinda kanini, hatiri undu o –wothe uroneka ta ungicenjio

h) Mahuthiro ma uhoro uria ukuheana makiria ma mutaratara uyu. (*Future use of the research data beyond the current study and whether or not data will be destroyed.*)

Uhoro ucio ukuheana ni ukuigwo wega na no –uhuthirwo matuku magooka, no hatiri maundu maku mekuheanwo kuri andu angi

i) Kuria ithimi cigwikirwo (*Location of tests*)

Hatiri ithimi cigekirwo kundu kungi tiga iria uguthimwo guku mucii.

j) Kurio ciuria, ciuria iriku, na uraihu wa mutaratara uyu na kana no utige mutaratara uyu wi gatagati-ini wago. (*Administration of questionnaire or interview to be conducted, a description of the questionnaire/interview, the length of time taken to complete the interview and on whether the participants may opt out from some questions or entire interview.*)

Mutaratara-ini uyu ni ukurio ciuria ni mundu ugikorwo uui kana utoi. Kahinda ni nuthu ithaa. No wage gucokia ciuria ciothe, na no utigane nago ona wi gatagate wago. No unghota kurikia cioria ciothe –ri niguo wega. Ukurio ciuria kuringana na mirimu, miikarie, mirire, yaku.

k) Uhoro kuma kwi rifoti cia thibitari (*data abstraction from medical records or from other confidential sources*)

Niguo tutigirire uhoro uria uraheana ni wa ma –ri, no urio uneane rifoti ciaku cia thibitari, kana wonanie dawa iria uranyua, no gutiri kindu giaku gigukuo kuma kuriwe.

l) Kuhuruo mbica kana miario kunyitwo (*Use of videotaping, taking photographs or audio recordings during the study.*)

Gutiri mbica ukuhurwo kana miario ikunyitwo thimu ini kana handu o hothe.

m) Guthondekwo kwa indo cia ki biashara kuma indo iria ukuheana cia mwiri-ini waku. (*Development of products of commercial importance from blood samples, DNA, RNA extracted and the plans for benefit sharing.*)

Gutiri indo ciothe cia ki biashara cigothodekwo kuma mutarataraini uyu. Na gutiri indo uraheana kuma mwiri ini waku.

n) Ku-umira, na kuigua uru niundu wa mutaratara uyu. (Potential Harm, Injuries, Discomforts or Inconvenience, Risks)

a. Maundu moikaine kana matoikaine mangituma umire kana unyaririke mutarataraine uyu. (*Unknown or known harm/risk to the study participants.*)

Gutiri maundu o mothe moikaine maingituma uumire nigukorwo ni waingira mutarataraine uyu

b. Maundu maroneka ta mangituma unyaririke (known or anticipated risk to the study participants)

Gutiri undu o wotho uroneka ungituma ukorwo ukinyaririka nigukoruo wi mutarataraine uyu

o) Kurathimika / Iheo (Potential Benefits)

a. Maundu ma kugunika kana kurathimika niundu wa gukorwo wi mutarataraine uyu. (*Benefits, direct or indirect to the study participants on participation in the study*)

Hatiri maundu kana indo ukuheo we mwene niundu wa gukorwo wi mutarataraini uyu. Andu akuru a guku no mateithike mathina mao ma menyeka wega kuma uhoro uria ukuheana. Thirikari no ithodeke mawatho mega ma kurora andu akuru na mathina mao ma kimwiri.

b. Kugunika kuma uhoro wa mutaratara uyu (*Benefits that may arise to the community or patients with a similar condition from the results of the study.*)

Gutiri ukuheo we mwene no uhoro uria ukuma mutarataraini uyu niugutuma andu akuru mateithike tondu maundu mao maria matumaga magwe ni mekumenyeka.

p) Guthondekwo kungi kana dawa ingi. (Alternative Procedures or Treatments[©])

Gutiri guthondekwo kungi kana dawa ingi ukuheo niundu wa gukorwo wi mutarataraini uyu.

q) U-thiri (Confidentiality)

a. (*No information that reveals the identity of any study participant should be released or published without*

consent.)

Gutiri uhoro waku kana uhoro ungituma umenyeke we mwene ukuheanwo kuma kwi mutaratara-ini uyu.

a) *Access by a sponsor, ERC or other health regulatory authorities for the purpose of monitoring the study.*

Maundu maria mothe mari mutarataraini uyu ni maroretwo ni anene niguo gutigirira hatiri undu o wotho wa kunyarira andu.

b) *The plan for maintaining confidentiality of research records.*

Uhoro wotho ni ukuigwo na uthiri. Na gutiri andu matari na rutha megwitikirio kuona uhoro uyu. Uhoro ucio ukuigwo wega uria andu angĩ matangihota kuwona.

Kurihwo (Reimbursement)

Gutiri marihi o mothe maraheanwo nigukorwo wi mutaratara-ini uyu.

Kuingira mutaratara-ini uyu (Participation)

55. a. Wetikira kuingira mutarataraini uyu, wagirirwo nigucokia ciuria ciothe. No ungi-igua ndurenda -ri, no otigane naguo na ndukurio ciuria o ciothe cia gitumi kiria wa rega. (If you enroll as a participant into this research, you are requested to respond to all questions, however, should you object, no questions shall be asked on the reasons for declining to join the study.)

b. Ni-ukuheo iratathi riri ria kuonania niwanyita mawatho ma mutaratara uyu wiige. ()

c. Ungikorwo wi murwaru muno-ri kahinda karia urorio ciuria cia mutaratara uyu-ri, ni – ugutumwo thibitari, no niwe ukwirihiira.

Contact:

a. Ungikorio wina ciuria o ciothe cia mutaratara uyu no urie kana uhure thimu namba iria iheanitwo ni mutwiria munene kana munini wake. (For any questions or concerns about the study or in the event of a study-related injury, the contact person is the principal investigator): Kimani Ernest N, 0721387448 and / or the principal investigator's representative who shall provide his/her 24-hour contact telephone number.

Name _____ Phone _____

b. Ungikoro wina thina / kana kiuria kuringana na mawatho ma mutaratara uyu – ri, no urie namba ici iheanitwo. (For any questions pertaining to rights as a research participant, the contact person is): The Secretary, KEMRI Ethics Review Committee, P. O. Box 54840-00200, Nairobi; Telephone numbers: 020-

2722541, 0722205901, 0733400003; Email address: erc-secretariat@kemri.org

All data collected from you will be coded in order to protect your identity, if applicable. Only the research study staff will have access to the information. At the end of the study, there will be no way to link your name with your data. Any additional information about the study will be provided to you including the final study results.

Uhoru o wothu ukuheana kuringana na undu ungikumenyithia ni ugucenjio niguu we mwene wa uhoru ucio ndukamenyeke. Muico wa mutaratara uyu-ri gutiri uria we ungimenyeka ati niwe waheaniere uhoru. Ni ukaheo kioneki kiria gikaumana na mutaratara uyu.

You are free to withdraw or refuse to answer any questions at any time without any consequences. Should you agree to participate in the study, please sign your name below, indicating that you have read and understood the nature of the study, your responsibilities as a study participant, the inconveniences associated with voluntary participation in the study and that all your questions and concerns concerning the study have been answered satisfactorily.

Niuhetwo rutha rwa gutigana na mutaratara uyu kana kurega gucokia ciuria ingi o tha ciothe hatari kuurio niki.

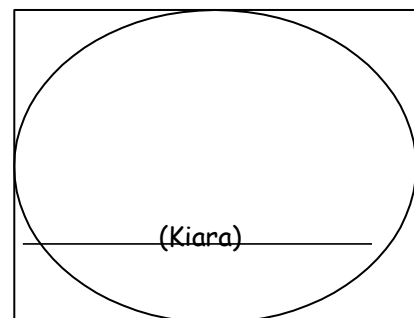
Okorwo niwetikira gukorwo mutaratara uyu-ri, wikire kiore haha thi, kuonania niwathoma rutha ruu na niwanyita uria mutaratara uyu uhana, maundu maria wagirirwo ni gwika, na niwetikira kuhingicika kwa maundu maku kuringana na kuingira mutaratara-ini uyu. Na ciuria ciothe cia mutaratara uyu iria ungikorwo nacio nicia cokio wega.

You will receive a copy of this signed consent form to take away with you.

Ni ukuheo rutha ruu uthie naruo.

Or (kana)

(Kirore) Signature of Study Participant _____



Thumbprint of the study participant

Signature of Person Obtaining Consent and Date