

Research Article

Nutritional Status and Its Associated Determinants Among Older Adults Living with Dementia in Homabay County, Kenya

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Abstract

Dementia is a growing public health concern among older adults, and its progression is closely linked to dietary practices and nutritional status. In Kenya, dementia research has largely focused on prevalence, risk factors and caregiving burden, with limited attention paid to dietary practices and nutritional status among affected older adults. This study assessed dietary practices, nutritional status and the factors associated with poor nutritional status among older adults living with dementia in Homabay County, Kenya. A cross-sectional study design was used, involving 191 older adults living with dementia attending Homabay County Referral Hospital, sampled using purposive and simple random sampling. A researcher administered questionnaire was used to collect data on socio-demographic characteristics, dietary practices using a 24-hour dietary recall, Dietary Diversity Score (DDS) and Food Frequency Questionnaire (FFQ), and nutritional status using Body Mass Index (BMI) and the Mini Nutritional Assessment Short Form (MNA-SF). Data was analyzed using SPSS version 29, with chi-square, Pearson correlation and binary logistic regression used to test associations. The mean age of participants was 74.3 ± 8.2 years. Only 11.5% of participants had a high dietary diversity score, and 70.2% did not meet their daily energy requirements. MNA-SF assessment showed that 48.7% of participants were at risk of malnutrition and 19.4% were malnourished. Binary logistic regression identified low dietary diversity (AOR = 3.87, $p < 0.001$), inadequate meal frequency (AOR = 2.96, $p = 0.003$), low energy intake (AOR = 2.63, $p = 0.007$), dependence on own farm produce as the main food source (AOR = 2.14, $p = 0.029$), and low household income (AOR = 1.89, $p = 0.043$) as independent factors associated with poor nutritional status. These findings show that dietary practices are strongly linked to the nutritional status of older adults living with dementia in this setting. Nutrition interventions targeting dietary diversity, meal frequency and household food security are recommended to improve the nutritional wellbeing of this vulnerable population.

Keywords

Dementia, Older Adults, Dietary Practices, Nutritional Status, Malnutrition, Dietary Diversity, Kenya

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Received: 17 September 2026; Accepted: 4 October 2026; Published: 23 October 2026



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1. Introduction

Dementia is a neurological disorder that affects an individual's cognitive functions and ability to carry out normal daily activities [1]. Globally, dementia affects over 55 million people, with an additional 10 million new cases diagnosed each year, making it a major health concern for older adults [2]. In Africa, the prevalence of dementia is currently estimated to be at 5% among older adults, though rates vary widely by country and screening method [3]. Multi-national collaborative initiatives such as the African Dementia Consortium have been established to strengthen dementia research capacity and improve data availability across the continent [13]. This burden is expected to rise sharply in the coming decades due to population ageing and changing lifestyles [4]. In Kenya, back-estimated modelling based on a rural community screening study suggests a dementia prevalence of 9.4%, translating to approximately 258,000 older adults potentially living with dementia nationally [5].

Dietary practices and nutrition status are two important aspects of the wellbeing of older adults living with dementia. Poor nutrition is associated with greater cognitive decline, a cycle that leaves affected individuals more vulnerable to further deterioration [4]. Despite this growing burden, research attention on dementia in Kenya has focused largely on prevalence, risk factors, caregiving burden and mental health outcomes [5], with dietary practices among older adults living with dementia remaining largely unexamined. This is in contrast to other countries, where studies have established clear links between dietary practices, nutritional status and dementia among older populations. In Central Africa, undernutrition was found to be significantly more common among older adults with dementia than those without [6]. More recently, a study in neighboring Uganda demonstrated a strong association between geriatric malnutrition and dementia risk [7]. This study therefore assessed dietary practices, nutritional status and the factors associated with poor nutritional status among older adults living with dementia in Homabay County, Kenya, to generate evidence that can inform targeted nutrition interventions for this vulnerable population.

2. Materials and Methods

2.1. Study Design and Population

A cross sectional study design was used. The sample size was determined using the Fisher et al. (1998) formula, with a conservative proportion of 0.5 used since the true proportion of poor nutritional status in this population was unknown, giving an initial sample size of 384. Since the target population of 335 diagnosed dementia patients regularly attending Homabay County Referral Hospital [8] was below 10,000, the finite population correction formula was applied, giving a sample size of 179, adjusted to a target of 197 to account for

a 10% non-response rate. Purposive sampling was used to identify patients diagnosed with dementia who regularly attended the clinic, followed by simple random sampling to select participants from this list. Of the targeted 197 participants, 191 older adults living with dementia were successfully interviewed, giving a response rate of 97.0%.

2.2. Location of the Study

The study was conducted in Homabay County, located in the western part of Kenya. The county has an elderly population of 89,270 [9], with hypertension, arthritis and diabetes being common comorbidities among older adults in the region [14].

2.3. Target Population

The target population was older adults aged 60 years and above who were living with dementia and attending Homabay County Referral Hospital. Having a caregiver was not an eligibility requirement. Where a caregiver was present, they were also engaged to assist with recall where the participant's cognitive status required it. Older adults aged 60 years and above diagnosed with dementia and residing in Homabay County were included in the study. Older adults with dementia who declined to give consent were excluded, as were those hospitalized during the research period.

2.4. Data Collection Instruments

A researcher administered structured questionnaire was used to collect data on socio-demographic and socioeconomic characteristics, dietary practices and nutritional status. Dietary practices were assessed using a combination of tools: a 24-hour dietary recall, a Food Frequency Questionnaire (FFQ), and the Dietary Diversity Score (DDS), while nutritional status was assessed using the Mini Nutritional Assessment Short Form (MNA-SF) and anthropometric measurements (weight, height and Body Mass Index). The FFQ assessed the habitual consumption patterns of key food groups over the preceding month using fixed frequency categories (daily, 4-6 times a week, 1-3 times a week, less than once a week, or never). Key Informant Interviews (KII) were also conducted with healthcare professionals at the dementia clinic to obtain expert insight on the dietary practices and nutritional challenges of this population.

2.5. Validity and Reliability

The internal consistency of the multi-item instruments used in the study, namely the FFQ and the MNA-SF, was assessed separately using Cronbach's alpha coefficient, since each instrument measures a distinct construct. A Cronbach's alpha

coefficient of 0.78 was obtained for the FFQ and 0.84 for the MNA-SF, both indicating good internal reliability. A coefficient of 0.70 or higher was considered acceptable for this study. The 24-hour dietary recall and BMI were not subjected to Cronbach's alpha testing because they are standardized dietary assessment and anthropometric measurement methods rather than multi-item questionnaires. Similarly, the DDS was not subjected to Cronbach's alpha testing, as it is a derived count of food groups consumed calculated from the 24-hour dietary recall data rather than a standalone multi-item scale.

2.6. Pre-testing

The questionnaire was pre-tested on 20 respondents, representing 10% of the sample size, at Rachuonyo Sub-County Hospital, a facility with characteristics similar to the study site, to check for clarity, comprehensibility and cultural appropriateness of the tools before the main data collection exercise.

2.7. Ethical Considerations

Authority to carry out this study was sought from Kenyatta University Graduate School. Ethical clearance was obtained from the Kenyatta University Ethics Review Committee, and a research permit was obtained from the National Commission for Science, Technology and Innovation (NACOSTI). Authority to conduct the study at Homabay County Referral Hospital was granted by the hospital management. Written informed consent was obtained directly from participants where the attending clinician confirmed they could communicate reliably, or from their caregiver otherwise, and confidentiality was maintained throughout the study.

2.8. Data Analysis

Data was cleaned and analyzed using Statistical Package for Social Sciences (SPSS) version 29. Descriptive statistics including frequencies, percentages and means were used to summarize categorical and continuous variables. Chi-square and Pearson correlation were used to determine associations between variables, and binary logistic regression was used to identify independent factors associated with poor nutritional status. A p value of less than 0.05 was considered statistically significant.

3. Results

3.1. Socio-Demographic and Socioeconomic Characteristics

A total of 191 older adults living with dementia participated in the study, representing a response rate of 97.0%. The mean age of participants was 74.3 ± 8.2 years, and more than half (55.0%) were female. Widowed participants formed the largest marital status group (42.9%). Regarding education, 20.4% had no formal education. The majority of participants (68.1%) had been engaged in farming as their primary lifetime livelihood, but only 25.7% remained economically active at the time of the study. Nearly half (48.7%) earned below KES 2,000 per month, and 38.2% obtained their food mainly from their own farm or garden. Most participants (79.6%) had a caregiver, though this was not a requirement for study eligibility.

Table 1. Socio-demographic and socioeconomic characteristics of older adults living with dementia (n=191).

Variable	Category	n (%)
Sex	Female	105 (55.0)
	Male	86 (45.0)
Age (mean $\pm$ SD = 74.3 ± 8.2 years)	60-69 years	57 (29.8)
	70-79 years	91 (47.6)
	80-89 years	35 (18.3)
	>90 years	8 (4.3)
Marital status	Widowed	82 (42.9)
Education level	No formal education	39 (20.4)
	Yes	152 (79.6)
Presence of caregiver	No	39 (20.4)
	Yes	152 (79.6)
Monthly income	Below KES 2,000	93 (48.7)
Main source of food	Own farm/garden	73 (38.2)

3.2. Dietary Practices

The mean number of meals consumed per day was 2.8 ± 0.9 , with 47.6% of participants consuming three meals a day and 38.2% reporting skipping meals, most commonly due to lack of appetite (54.8%). Regarding dietary diversity, only 11.5% of participants achieved a high DDS of six or more food groups per day, while 33.0% had a low DDS of three or fewer food groups. The mean daily energy intake was $1,389 \pm 312$ kcal/day, and 70.2% of participants did not meet their daily

energy requirements.

Food Frequency Questionnaire findings further supported this pattern. Cereals and tubers were the most frequently consumed food group, with 88.0% of participants consuming this group at least four times a week, a pattern also observed for fats and oils (81.1%) and sugars and beverages (91.6%). In contrast, only 12.0% of participants frequently consumed fruits and only 9.4% frequently consumed animal proteins, while 53.4% and 49.2% consumed these groups infrequently, respectively.

Table 2. Frequency of consumption of key food groups among older adults living with dementia (n=191).

Food Group	Frequent ($\geq 4x/\text{week}$) n (%)	Moderate (1-3x/week) n (%)	Infrequent ($< 1x/\text{week}$ or never) n (%)
Cereals and tubers	168 (88.0)	19 (9.9)	4 (2.1)
Vegetables	123 (64.4)	54 (28.3)	14 (7.3)
Fruits	23 (12.0)	66 (34.6)	102 (53.4)
Animal proteins	18 (9.4)	79 (41.4)	94 (49.2)
Legumes, nuts and seeds	74 (38.7)	87 (45.6)	30 (15.7)
Milk and milk products	42 (22.0)	63 (33.0)	86 (45.0)
Fats and oils	155 (81.1)	29 (15.2)	7 (3.7)
Sugars and beverages	175 (91.6)	15 (7.9)	1 (0.5)

3.3. Nutritional Status

The mean BMI of participants was 22.4 ± 3.8 kg/m², based on the 185 participants for whom BMI could be measured; the remaining 6 bed/chair-bound participants were assessed using calf circumference instead. The mean MNA-SF score was 10.2 ± 2.4 . Using conventional BMI classification, 53.5% of participants had a normal BMI. However, MNA-SF assessment, conducted among all 191 participants, showed that 48.7% were at risk of malnutrition and 19.4% were malnourished, indicating that BMI alone underestimated nutritional risk in this population.

Table 3. BMI classification of older adults living with dementia (n=185).

Description	n	%
Underweight (< 18.5 kg/m ²)	27	14.6
Normal (18.5-24.9 kg/m ²)	99	53.5
Overweight (25-29.9 kg/m ²)	50	27.0

Description	n	%
Obese (> 30 kg/m ²)	9	4.9

3.4. Factors Associated with Poor Nutritional Status

Binary logistic regression was conducted to identify independent factors associated with poor nutritional status among older adults living with dementia. All variables that showed a significant relationship in chi-square and Pearson correlation analysis were entered into the model. Low dietary diversity was the strongest independent factor associated with poor nutritional status (AOR = 3.87, 95% CI: 1.84-8.14, $p < 0.001$), followed by inadequate meal frequency (AOR = 2.96, 95% CI: 1.45-6.04, $p = 0.003$), low energy intake (AOR = 2.63, 95% CI: 1.31-5.28, $p = 0.007$), dependence on own farm produce as the main food source (AOR = 2.14, 95% CI: 1.08-4.24, $p = 0.029$), and low household income below KES 2,000 (AOR = 1.89, 95% CI: 1.02-3.51, $p = 0.043$).

Table 4. Factors associated with poor nutritional status among older adults living with dementia.

Variable	AOR	95% CI	p-value
Low DDS (vs. minimum/high DDS)	3.87	1.84-8.14	<0.001
Less than 3 meals/day (vs. ≥ 3 meals/day)	2.96	1.45-6.04	0.003
Low energy intake (vs. adequate energy intake)	2.63	1.31-5.28	0.007
Own farm as source of food (vs. market/other)	2.14	1.08-4.24	0.029
Low income below KES 2,000 (vs. higher income)	1.89	1.02-3.51	0.043

4. Discussion

4.1. Dietary Practices

This study found low dietary diversity and inadequate energy intake among older adults living with dementia in Homabay County, with only 11.5% of participants achieving a high DDS and 70.2% not meeting their daily energy requirements. FFQ findings supported this pattern, showing high consumption of staple, energy-dense foods such as cereals, fats and sugars, and low consumption of fruits and animal proteins. This is consistent with Filippini et al. (2020) [10], who found that diets high in cereals and sweets but low in fruits, vegetables and fish were linked to poorer diet quality and higher dementia risk, and with Morris et al. (2018) [11], who found that low fruit and vegetable intake was linked to faster cognitive decline in older adults. This aligns with Otsuka et al. (2023) [15], who found that greater dietary diversity was associated with a lower risk of late-life disabling dementia. The low intake of animal protein and dairy observed in this study is likely tied to affordability, since most participants depended on farm produce and had limited household income, consistent with Arifin et al. (2024) [12], who found that older adults with dementia in low-resource settings often rely on cheaper, carbohydrate-heavy staples due to limited purchasing power.

4.2. Nutritional Status

BMI and MNA-SF classifications showed a clear discrepancy in this study. MNA-SF identified substantially more participants as at risk of or already experiencing malnutrition than BMI alone did. This highlights the limitation of using BMI alone to screen for nutritional risk among older adults with dementia. This finding supports the use of multidimensional screening tools such as the MNA-SF alongside anthropometric measurements in this population.

4.3. Factors Associated with Poor Nutritional Status

Low dietary diversity was the strongest factor associated with poor nutritional status in this study. This shows that the variety of foods consumed plays a central role in shaping nutritional outcomes among older adults with dementia. Inadequate meal frequency and low energy intake were also strongly associated with poor nutritional status, reflecting the direct pathway between dietary practices and nutritional outcomes in this population. The association between dependence on own farm produce, low household income and poor nutritional status reflects the broader socioeconomic vulnerability of this rural population and its impact on access to diverse and adequate food.

5. Conclusions

This study found low dietary diversity, inadequate meal frequency and low energy intake among older adults living with dementia in Homabay County, Kenya, alongside a substantial burden of malnutrition that was underestimated by BMI alone, consistent with calls for multi-sectoral, context-specific dementia risk-reduction strategies in African settings [16]. These factors, together with dependence on own farm produce and low household income, were independently associated with poor nutritional status. These findings highlight the need for nutrition interventions that improve dietary diversity and food security among older adults living with dementia in similar rural settings.

Abbreviations

BMI	Body Mass Index
DDS	Dietary Diversity Score
FFQ	Food Frequency Questionnaire
MNA-SF	Mini Nutritional Assessment Short Form
AOR	Adjusted Odds Ratio
CI	Confidence Interval
SPSS	Statistical Package for Social Sciences
KII	Key Informant Interview

Acknowledgments

Special thanks go to the County Government of Homabay and the management of Homabay County Referral Hospital for granting permission for the research to be conducted. Thanks also go to the staff of the dementia clinic for their co-operation during data collection, and to the study participants and their caregivers.

Author Contributions

Melon Amondi Odoyo: Conceptualization, Formal Analysis, Investigation, Methodology, Project administration, Writing – original draft

Peter Chege: Supervision, Writing – review & editing

Winfreda Nyamota: Supervision, Writing – review & editing

Data Availability Statement

The data supporting the outcome of this research work has been reported in this manuscript.

Conflicts of Interest

The authors declare no conflicts of interest.

References

- [1] World Health Organization. Dementia. Fact Sheet. Geneva: World Health Organization; 2023.
<https://www.who.int/news-room/fact-sheets/detail/dementia>
- [2] GBD 2019 Dementia Forecasting Collaborators. Estimation of the global prevalence of dementia in 2019 and forecasted prevalence in 2050: an analysis for the Global Burden of Disease Study 2019. *Lancet Public Health*. 2022; 7(2), e105-e125.
[https://doi.org/10.1016/S2468-2667\(21\)00249-8](https://doi.org/10.1016/S2468-2667(21)00249-8)
- [3] Ogunniyi, A., & Farombi, T. H. Documenting the burden of dementia in Africa: new approaches and key lessons. *The Lancet Global Health*. 2024; 12(12), e1913-e1914.
[https://doi.org/10.1016/S2214-109X\(24\)00370-X](https://doi.org/10.1016/S2214-109X(24)00370-X)
- [4] Alzheimer's Society. The progression and stages of dementia. Alzheimer's Society; 2020.
- [5] Musyimi, C. W., Ndeti, D. M., Muyela, L. A., Masila, J., & Farina, N. Dementia screening in rural Kenya: The prevalence and impact of screening positive for dementia. *Neuroepidemiology*. 2024; 58(3), 174-181.
<https://doi.org/10.1159/000536012>
- [6] de Rouvray, C., et al. The nutritional status of older people with and without dementia living in an urban setting in Central Africa: The EDAC study. *The Journal of Nutrition, Health & Aging*. 2014; 18(10), 868-875.
<https://doi.org/10.1007/s12603-014-0483-7>
- [7] Christopher, O., et al. Association between geriatric malnutrition and the risk of dementia: a retrospective cross-sectional cohort study in Uganda. *BMC Geriatrics*. 2026.
<https://doi.org/10.1186/s12877-026-07769-0>
- [8] Homabay County Referral Hospital. Hospital dementia patient records. Homabay County Referral Hospital; 2025.
- [9] Kenya National Bureau of Statistics. 2019 Kenya Population and Housing Census Volume I. Nairobi: KNBS; 2019.
- [10] Filippini, T., et al. Dietary habits and risk of early-onset dementia in an Italian case-control study. *Nutrients*. 2020; 12(12), 3682. <https://doi.org/10.3390/nu12123682>
- [11] Morris, M. C., et al. Nutrients and bioactives in green leafy vegetables and cognitive decline: Prospective study. *Neurology*. 2018; 90(3), e214-e222.
<https://doi.org/10.1212/WNL.0000000000004815>
- [12] Arifin, H., et al. Meta-analysis and moderator analysis of the prevalence of malnutrition and malnutrition risk among older adults with dementia. *International Journal of Nursing Studies*. 2024; 150, 104648.
<https://doi.org/10.1016/j.ijnurstu.2023.104648>
- [13] Akinyemi, R. O., Owolabi, M. O., Okubadejo, N., Ogunniyi, A., & Kalaria, R. N. The African dementia consortium. *Lancet Neurology*. 2023; 22(1), 28.
[https://doi.org/10.1016/S1474-4422\(22\)00475-6](https://doi.org/10.1016/S1474-4422(22)00475-6)
- [14] Bergman, H., Borson, S., Jessen, F., Krolak-Salmon, P., Pirani, A., Rasmussen, J., Rodrigo, J., & Taddeo, D. Dementia and comorbidities in primary care: A scoping review. *BMC Primary Care*. 2023; 24, 277.
<https://doi.org/10.1186/s12875-023-02229-9>
- [15] Otsuka, R., Zhang, S., Ihira, H., Sawada, N., Inoue, M., Yamagishi, K., Yasuda, N., & Tsugane, S. Dietary diversity and risk of late-life disabling dementia in middle-aged and older adults. *Clinical Nutrition*. 2023; 42(4), 541-549.
<https://doi.org/10.1016/j.clnu.2023.02.002>
- [16] Udeh-Momoh, C. T., Maina, R., Anazodo, U. C., Akinyemi, R., Atwoli, L., Baker, L., et al. Dementia risk reduction in the African context: Multi-national implementation of multimodal strategies to promote healthy brain aging in Africa (the Africa-FINGERS project). *Alzheimer's & Dementia*. 2024; 20(12), 8987-9003. <https://doi.org/10.1002/alz.14344>

Biography



Melon Amondi Odoyo is a Master of Science student in Food, Nutrition and Dietetics at Kenyatta University. She holds a Bachelor's degree in Food, Nutrition and Dietetics from the same university. Her specialty is in community nutrition, and she is passionate about research, particularly in the nutrition of vulnerable populations such as older adults living with dementia.



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Winfreda Nyamota is a lecturer at Kenyatta University, department of Food, Nutrition and Dietetics. She holds a PhD in Foods Nutrition and Dietetics from Kenyatta University, a master's degree in Food Science and Nutrition from Mysore University, and a bachelor's degree from the University of Delhi. Her specialty is in clinical nutrition and dietetics, and she has contributed to studies involving therapeutic nutrition, dietary diversity, functional foods, and geriatric nutrition.

Research Field

Melon Amondi Odoyo: community nutrition, geriatric nutrition, dementia, dietary practices, public health nutrition

Peter Chege: malnutrition, maternal and child nutrition, agri-nutrition, food security, micronutrients

Winfreda Nyamota: clinical nutrition and dietetics, therapeutic nutrition, dietary diversity, geriatric nutrition, functional foods