

Dietary Intake Patterns and Associated Chronic Conditions among Elderly Residents in Geriatric Home in Sulaymaniyah City



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ABSTRACT

Older adults in geriatric homes are at increased risk of poor dietary patterns and chronic diseases that adversely impact nutritional status and quality of life. This study aimed to assess dietary patterns and chronic diseases among residents of a geriatric home in Sulaymaniyah City, Iraq. A descriptive cross-sectional quantitative study was conducted from November 30, 2025, to February 28, 2026, at Sulaymaniyah Geriatric Home. A convenient sample of 70 elderly residents was included. Data were collected using interviews, a structured questionnaire, anthropometric measurements, blood pressure assessment, and laboratory tests. Data were analyzed using the Statistical Package for the Social Sciences version 26.0. All residents consumed three institution-prepared meals daily, yet dietary diversity was limited: Only 2.90% consumed fruit and raw vegetables more than twice weekly, 98.60% rarely consumed fish, all residents consumed sweets daily, and 94.30% rarely drank six or more cups of water per day. Overall, 47.10% of participants were overweight and 25.70% were obese. Vitamin D deficiency was found in 65.70%, low iron levels in 32.90%, hypertension in 48.57%, diabetes in 25.71%, and multimorbidity in 65.71%. Body mass index (BMI), waist circumference (WC), and blood glucose significantly predicted systolic blood pressure and hypertension. Residents exhibited monotonous, low-diversity dietary patterns, a high prevalence of vitamin D and iron deficiency, and a substantial chronic disease burden, with BMI, WC, and blood glucose identified as significant predictors of cardiometabolic risk. Routine nutritional assessment, dietary education, and systematic chronic disease screening are required in geriatric homes.

Index Terms: Dietary Patterns, Chronic Diseases, Geriatric Home, Elderly, Nutrition

1. INTRODUCTION

Among the most notable demographic shifts of the 21st century has been the aging of the population, which has been followed by an increase in the prevalence of chronic illnesses and nutritional weaknesses, especially among older adults residing in geriatric homes [1]. Some estimates indicate

that 30–60% of geriatric home residents are malnourished or at risk of malnutrition. This is mostly due to a lack of geriatric evaluation, inadequate dietary monitoring, and inadequate nutritional screening [2]. Demand for nutritional and chronic disease care among older adults is expected to increase substantially, as the global population aged 60 years and over is projected to rise from 12.1% in 2015 to 22.2% in 2050 [3], [4]. The effects of aging are felt most acutely by those in areas where specialist nutritional services are few, community support is weak, and geriatric infrastructure is lacking [5]. Geriatric nutrition in geriatric homes has received limited attention over the past two decades, since global health programs have mostly targeted communicable and non-communicable disorders [6]. There has been a severe

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lack of established geriatric care and nutritional programs in the Kurdistan Region of Iraq, despite a 35% increase in the older population in the last decade [7]. Malnutrition among older adults in geriatric homes remains persistently under-recognized, and its severity is frequently underestimated and essential to integrating nutritional evaluation [8], [9].

Unlike many age-related diseases, poor eating habits negatively impact metabolic control, immune function, and the development of chronic disease into later life [10]. In otherwise functionally stable older adults, inadequate nutrition may present with subtle indicators such as fatigue, weight loss, or unexplained weakness [11]. Nutritional deficiencies, particularly vitamin D and iron deficits, are 2–4 times more frequent among older adults in geriatric homes than among those living in the community [12]. Those who suffer from hypertension, diabetes, and cardiovascular disease, on the other hand, are more likely to have faster functional decline and a shorter life expectancy [13]. Limited variety in the meals provided in geriatric homes may worsen pre-existing conditions and delay recovery from acute illness or injury [14]. More than three-quarters of older adults residing in geriatric homes have at least one chronic illness, and over half of those people have multimorbidity, which is defined as two or more coexisting diseases [15]. Cardiometabolic outcomes, such as hypertension, hyperglycemia, and dyslipidemia, may be worsened in these residents when the intake of water, fruit, and vegetables is inadequate [16].

The efficacy of nutritional and pharmacological interventions for the management of chronic illness and nutritional status in older adults is frequently determined by dietary adherence, institutional resources, and individual health status [17]. Availability continues to be an issue in many low- and moderate-income regions, with expected improvements in health outcomes for the elderly via nutritional supplements and dietary counselling [18]. Although conventional medications are still the standard treatment, dietary and nutritional interventions may play an important complementary role in the management of chronic diseases among older adults [19]. The continuation of unhealthy eating patterns also worsens the consequences of chronic diseases, which in turn increases hospitalizations and reduces quality of life for older adults residing in geriatric homes [20]. Due to a lack of defined standards, insufficient funding, and a scarcity of qualified personnel, less than a quarter of Middle Eastern geriatric homes provide organized nutritional assessments for their residents [20].

Assessing the relationships between dietary habits, chronic illness, and aging among older adults residing in geriatric homes is critical, given the complex interaction of these

factors [21]. Prevention and treatment results in geriatric care should be improved with an emphasis on easily available, culturally adaptable nutritional evaluation tools [22]. Dietary inadequacy is strongly associated with an increased risk of hypertension, diabetes, and nutritional inadequacies in the elderly, according to previous research conducted in Europe and Asia [23]–[25]. The purpose of this study was to evaluate the dietary patterns and chronic illnesses of older adults residing in a geriatric home in Sulaymaniyah City, Iraq.

2. RESEARCH QUESTION

What are the dietary patterns and prevalence of chronic diseases among residents of the geriatric home in Sulaymaniyah City during 2025–2026?

3. METHODS

3.1. Study Design, Setting, Period, and Sampling

This descriptive cross-sectional quantitative study was conducted from November 30, 2025, to February 28, 2026, at the Sulaymaniyah Geriatric Home in Sulaymaniyah City, Kurdistan Region, Iraq. A convenient sampling technique was employed to recruit participants. A formal approval was obtained from the University of Sulaimani, College of Nursing, to conduct the research. This setting represents one of the principal geriatric homes for older adults in the region and therefore permitted the study of a broad group of residents with varied health and nutritional characteristics. Geriatric home is located in Sitak district/Sulaymaniyah city which is managed by 36 personnel, 6 of them medical staff, and 3 prepare meals.

3.2. Sample Size

Using a convenience sampling approach, the study used all 70 older residents who remained in Sulaymaniyah Geriatric Home. To ensure that the study included a representative cross-section of the geriatric home population, all residents who were eligible and willing to take part were included in the data collection.

3.3. Inclusion and Exclusion Criteria

The study included all geriatric persons who stayed in a geriatric home. Eligible residents provided oral consent; some of them had mild cognitive or psychiatric impairments, due to that they were excluded.

3.4. Study Tools and Data Collection

Data were collected through face-to-face interviews, with the constructed questionnaire filled out by the researcher

to ensure accuracy and completeness. The questionnaire consisted of multiple sections covering sociodemographic characteristics, dietary patterns, lifestyle behaviors, and chronic disease history. In addition, anthropometric measurements were taken, including height and weight (using a calibrated medical stadiometer and digital scale) for body mass index (BMI) calculation and waist circumference (WC) using a standard non-elastic measuring tape. Normal range of WC for men is ≥ 102 cm and for women is ≥ 88 cm. BMI was calculated using the standard formula: $BMI = \text{Weight (kg)} / \text{Height}^2 (\text{m}^2)$. Categories of BMI are normal: $18.5\text{--}24.9 \text{ kg/m}^2$, overweight: 25.0 kg/m^2 and 29.9 kg/m^2 , and obesity: 30 kg/m^2 or greater. Blood pressure was measured using a calibrated digital sphygmomanometer with the participant in a seated position after a 5-min rest. Laboratory tests included low-density lipoprotein (LDL) cholesterol, serum iron, vitamin D, and blood glucose, all measured using standard automated analyzers at the affiliated clinical laboratory. Venous samples for the lipid profile (LDL cholesterol), serum iron, vitamin D, and blood glucose were drawn after an overnight fast of at least 8 h. Each geriatric person needed nearly 40–45 min for filling the questionnaire and measuring blood pressure, BMI, waist measurement, drawn the blood for investigations.

3.5. Measures

3.5.1. Sociodemographic characteristics

The first section of the questionnaire (Section A) collected sociodemographic data of participants, including residents' full name (optional), age, gender, marital status, education level, duration of stay in the geriatric home, and source of income or pension. In addition, this section included anthropometric and clinical parameters such as weight, height, BMI, WC, blood pressure, fasting blood glucose, and laboratory tests including serum iron, vitamin D, and LDL cholesterol.

3.5.2. Dietary patterns assessment

The second section (Section B) assessed dietary patterns of participants and consisted of multiple components. Participants were first asked about the number of meals consumed per day, snacking behavior, and who prepared their meals. Food group consumption was then assessed using a structured frequency table covering 15 food groups including fruits, raw and cooked vegetables, red meat, chicken or poultry, fish, eggs, dairy products, legumes, bread and pasta, rice and grains, nuts and seeds, sweets, junk food, and soft drinks. The frequency of using each food group was characterized as never/rarely, once/day, 2–3 times/day, and 2–3 times/week. Another table covered eating habits, such as

how often people ate breakfast, how often they snacked, how late they ate, how often they ate out, how much water they drank (six cups or more per day), how often they added salt or sugar to their food, and if they took dietary supplements. Other parts dealt with food allergies or intolerances and specific therapeutic diets, such as low-salt, low-glycemic, or vegetarian diets.

3.5.3. Clinical characteristics and chronic disease profile

Section C examined the clinical features of the patients and their history of chronic diseases. It covered the existence of common chronic disorders such as hypertension, diabetes, heart disease, arthritis, osteoporosis, chronic respiratory diseases, renal disease, vision issues, hearing problems, and Parkinson's disease. Participants were asked about the length of time from diagnosis, current usage of medicine, frequency of medical check-ups, impression of the effect of diet on their health, if they had received nutritional counseling at the geriatric home, and their assessment of the food supplied at the institution. Other functional signs of eating considered were lack of appetite or difficulties in chewing or swallowing.

3.5.4. Lifestyle and physical activity

The fourth segment (segment D) evaluated lifestyle and physical activity habits of individuals. The questionnaire asked about involvement in regular physical activity, types of activities done (walking, light exercise, group exercise courses, gardening, or climbing stairs), how often they did physical activity each week, how long on average they did it each day, and how much time they spent sitting. The current study also evaluated sleep duration, smoking status (current, former, never), passive smoking exposure, alcohol use, frequency of social activities, and state of peace of mind, which was assessed by using a single self-report item ("In general, how would you rate your peace of mind level?") with four ordered response options (very low, low, moderate, and high); no validated multi-item peace of mind scale was administered, and this is acknowledged as a limitation. No standardized knowledge assessment instrument was used in this study, and no knowledge outcomes are therefore reported.

3.6. Ethical Approval and Informed Consent

Ethical permission for this research was received from the Committee of Ethics of the College of Nursing, University of Sulaimani. Before the data collection, permission from the management of the geriatric home was obtained. Informed consent was acquired from all subjects or their legal guardians before participation. Participant information was kept fully

confidential and anonymous throughout the research, and participation was voluntary.

3.7. Validity, Pilot study, and Reliability

The data collection validity was established through a review process involving 11 experts. They evaluated and provided feedback on the study tool, leading to revisions that enhanced the instrument's final validity by making it more pertinent and comprehensible. The pilot study was conducted with 10 geriatric persons. The reliability was determined by the Cronbach Alpha Correlation Coefficient, producing a strong association ($r = 0.80$).

3.8. Statistical Analysis

Version 26 of the Statistical Package for the Social Sciences was used to code and organize the data into computer files. Inferential data analysis, frequency and percentage computation, and Chi-square and independent *t*-test were used to process the data. Receiver operating characteristic (ROC) analysis was utilized to determine the optimum WC cut-off for predicting hypertension. A $P < 0.05$ was considered significant.

4. RESULTS

4.1. Sociodemographic and Clinical Characteristics of Participants

The research included 70 senior citizens, with an average age of 72.21 ± 10.01 years, and included 41 men (58.60%) and 29 females (41.40%). The majority of participants were older adults, with 44.30% falling into the age bracket of 66–76. In terms of marital status, 41.40% were widowed, 27.10% were divorced, 25.70% were single, and 5.70% were married. Regarding educational attainment, 54.30% had received no formal schooling, while 34.30% had completed primary school only. Seventy percent had resided in the geriatric home for more than 1 year, and 58.60% reported having no personal source of income. Half of the participants had a normal WC, and the mean was 86.24 ± 18.10 cm, while 47.10% were overweight and 25.70% were obese. Iron deficiency was identified in 32.90% of participants (mean iron level 76.31 ± 33.39 $\mu\text{g/dL}$) and vitamin D insufficiency in 65.70% (mean 18.53 ± 11.90 ng/mL). Optimal LDL cholesterol (<100 mg/dL) was recorded in 41.40% of participants (mean 105.97 ± 39.30 mg/dL), whereas 34.30% had elevated blood glucose (≥ 140 mg/dL; mean 134.54 ± 35.92 mg/dL). With an average systolic blood pressure (SBP) of 133.94 ± 24.01 mmHg and diastolic blood pressure (DBP) of 82.96 ± 11.48 mmHg, 50% of the subjects had Stage 2 hypertension

and 37.14% had Stage 1 hypertension. The detailed findings are presented in Table 1.

4.2. Dietary Patterns and Food Consumption

All participants consumed three meals daily; 95.70% reported snacking between meals, and meals were prepared by geriatric home staff for 97.10% of residents. Cooked vegetables were consumed daily by 95.70% of participants, whereas 97.10% consumed fruit and raw vegetables only 2–3 times/week. Fish was rarely consumed (98.60%), while all participants consumed red meat, poultry, dairy products, and legumes 2–3 times/week (100%), indicating limited dietary diversity. As meals were prepared and provided by the institution rather than selected by residents, this limited diversity reflects the institutional menu rather than individual preference. Nearly all participants (98.60%) consumed bread or grains at least twice daily. All residents consumed sweets daily, whereas junk food and soft drinks were rarely consumed. With respect to hydration, 94.30% of participants rarely consumed six or more cups of water per day, although all participants drank water with meals. Although added salt was rarely used (100%), sugar was added to food and beverages 2–3 times daily by 92.90% of participants. Dietary supplement use was low (92.90% rarely or never), indicating that a dietary pattern that was monotonous and nutritionally diverse was limited. Further details are presented in Table 2.

4.3. Lifestyle, Appetite, and Functional Eating Characteristics

The findings indicated substantial functional eating difficulties, with 74.30% of participants reporting reduced appetite and 52.90% reporting difficulty chewing or swallowing. Physical inactivity was reported by 62.90% of participants, and 82.90% were sedentary for 5 h or more per day. Regarding sleep duration, 58.60% reported sleeping 6–8 h per night, while 20.00% reported sleeping <6 h. Current smoking was reported by 34.30% of participants, and 11.40% reported alcohol consumption. Low social participation was reported by 58.60% of participants. Moderate self-rated peace of mind was reported by 52.90% of participants and no peace of mind by 25.70%, indicating a substantial psychological burden among residents. Further details are presented in Table 3.

4.4. Chronic Diseases, Medication Use, and Multimorbidity

Almost all participants reported at least one chronic disease, with hypertension being the most prevalent (49.28%), followed by diabetes mellitus (26.9%); vision problems and

TABLE 1: Distribution of participants according to sociodemographic and clinical characteristics including blood pressure (n=70)

No.	Variables	Characteristics (n=70)	F	%
1.	Age (year)	55–65	18	25.70
		66–76	31	44.30
		77–87	14	20.00
		88–99	7	10.00
		Mean±SD		72.21±10.01
2.	Gender	Male	41	58.60
		Female	29	41.40
3.	Marital status	Single	18	25.70
		Married	4	5.70
		Widowed	29	41.40
		Divorced	19	27.10
4.	Educational levels	No formal schooling	38	54.30
		Primary School	24	34.30
		Secondary School	4	5.70
		High School	3	4.30
		University Degree	1	1.40
5.	Duration of stay in geriatric home	<6 months	8	11.40
		6 months–1 year	13	18.60
		>1 year	49	70.00
6.	Does your financial situation run your life?	Yes	29	41.40
		No	41	58.60
7.	BMI category	<18.5	4	5.70
		18.5–24.9	15	21.40
		25–29.9	33	47.10
		≥30	18	25.70
8.	Waist circumference	<90 cm	35	50.00
		90–101 cm	27	38.60
		≥102 cm	8	11.40
		Mean±SD		86.24±18.10
9.	Iron Level	<60 µg/dL	23	32.90
		60–170 µg/dL	47	67.10
		Mean±SD		76.31±33.39
10.	Vitamin D	<20 ng/mL	46	65.70
		20–29 ng/mL	18	25.70
		≥30 ng/mL	6	8.60
		Mean±SD		18.53±11.90
11.	Fasting blood glucose	<140 mg/dL	46	65.70
		140–199 mg/dL	20	28.60
		≥200 mg/dL	4	5.70
		Mean±SD		134.54±35.92
12.	LDL	<100	29	41.40
		100–129	19	27.10
		130–159	17	24.30
		160–189	4	5.70
		≥190	1	1.40
		Mean±SD		105.97±39.30
13.	Blood pressure	Normal (<120/<80)	4	5.70
		Elevated (120–129/<80)	5	7.14
		Stage 1	26	37.14
		HTN (130–139/80–89)		
		Stage 2 HTN (≥140/≥90)	35	50.00
		SBP, mean±SD		133.94±24.01
		DBP, mean±SD		82.96±11.48

Values are presented as frequency (F) and percentage (%). Continuous variables are expressed as mean±SD and are reported immediately after their corresponding categories. SBP: Systolic blood pressure, DBP: Diastolic blood pressure. HTN: Hypertension, SD: Standard deviation. Blood glucose, serum iron, vitamin D, and LDL cholesterol were measured after an overnight fast of at least 8 h. Categories were defined according to standard clinical cut-off points

TABLE 2: Dietary patterns and food consumption among participants (n=70)

No.	Variable	Category	F	%
1.	Meals per day	3 meals	70	100.00
2.	Snacks between meals	Yes	67	95.70
		No	3	4.30
3.	Who prepares meals	Self	2	2.90
		Geriatric home staff	68	97.10
4.	Fruits	Once/day	2	2.90
		2–3 times/week	68	97.10
5.	Vegetables (raw)	Once/day	2	2.90
		2–3 times/week	68	97.10
6.	Vegetables (cooked)	Once/day	67	95.70
		2–3 times/week	2	2.90
		None	1	1.40
7.	Red meat	2–3 times/week	70	100.00
8.	Chicken/poultry	2–3 times/week	70	100.00
9.	Fish	Never/rarely	69	98.60
		Once/day	1	1.40
10.	Eggs	Once/day	2	2.90
		2–3 times/week	68	97.10
11.	Dairy products	2–3 times/week	70	100.00
12.	Legumes/beans	2–3 times/week	70	100.00
13.	Bread/pasta	2–3 times/day	69	98.60
		None	1	1.40
14.	Rice/grains	Once/day	70	100.00
15.	Nuts and seeds	Never/rarely	65	92.90
		Once/day	5	7.10
16.	Sweets	Once/day	70	100.00
17.	Junk food	Never/rarely	68	97.10
		2–3 times/week	2	2.90
18.	Soft drinks	Never/rarely	69	98.60
		2–3 times/week	1	1.40
19.	Eat breakfast	Once/day	70	100.00
20.	Eat late at night	Never/rarely	61	87.10
		Once/day	9	12.90
21.	Eat at restaurants	Never/rarely	67	95.70
		Once/day	1	1.40
		2–3 times/week	2	2.90
22.	Order food from outside	Never/rarely	68	97.10
		Once/day	2	2.90
23.	Drink ≥6 cups water/day	Never/rarely	66	94.30
		Once/day	4	5.70
24.	Drink water with meals	2–3 times/day	70	100.00
25.	Add salt to food	Never/rarely	70	100.00
26.	Add sugar to food/drinks	2–3 times/day	65	92.90
		Once/day	1	1.40
		Never/rarely	4	5.70
27.	Take dietary supplements	Never/rarely	65	92.90
		2–3 times/week	4	5.70
		Once/day	1	1.40

hearing problems were (4.35%). Heart disease and kidney disease were (8.7%), and hypertension and diabetes mellitus were (11.59%). In total, 71.40% of participants were currently taking medication, and 61.40% had been diagnosed for

more than 5 years. Notably, 98.60% of residents reported seeking medical consultation only when unwell, indicating that routine screening is not regularly undertaken. Details are presented in Table 4.

4.5. Association between Sociodemographic Characteristics and Health Outcomes

Several statistically significant associations between sociodemographic characteristics and health outcomes were identified. The proportion of obese female residents (41.38%) was significantly greater than that of male residents (14.63%) ($\chi^2 = 14.90$, $P < 0.01$). High self-rated not peace of mind was also reported more frequently by female residents (48.28% vs. 9.76%; $\chi^2 = 13.86$, $P < 0.01$). The prevalence of chewing and swallowing difficulty was significantly greater in the older age groups (77–99 years),

reaching 85.71% ($\chi^2 = 13.55$, $P < 0.01$). Marital status was significantly associated with no peace of mind, the highest not peace of mind levels being observed among widowed participants (41.38%; $\chi^2 = 18.25$, $P = 0.03$). Further details are presented in Table 5.

4.6. Predictors of Cardiometabolic Outcomes

SBP was significantly predicted by BMI, WC, and blood glucose. Multiple linear regression demonstrated positive associations between SBP and BMI ($\beta = 0.26$, 95% confidence interval [CI] 0.03 to 0.49, $P = 0.03$), WC ($\beta = 0.25$, 95% CI = 0.01 to 0.49, $P = 0.04$), and blood glucose ($\beta = 0.24$, 95% CI = 0.02 to 0.46, $P = 0.03$) and a negative association between serum iron and blood glucose ($\beta = -0.29$, 95% CI = -0.53 to -0.05 , $P = 0.02$). Logistic regression further identified BMI (odds ratio [OR] = 1.20, 95% CI = 1.03–1.40, $P = 0.02$), WC (OR = 1.05, 95% CI = 1.01–1.09, $P = 0.01$), and blood glucose (OR = 1.02, 95% CI = 1.00–1.04, $P = 0.04$) as significant predictors of hypertension status, indicating that anthropometric and metabolic factors substantially influence cardiovascular risk in this population. Further details are presented in Table 6.

4.7. Cardiometabolic Risk Stratification and Predictive Performance

Participants demonstrated a considerable burden of cardiometabolic risk. In the nutritional risk stratification, 34.29% were classified as high risk, 20.00% as very high risk, and only 15.71% as low risk. All participants had at least one cardiometabolic risk factor; 91.43% had two or more, 54.29% had three or more, and 8.57% had all five. The ROC analysis indicated that WC was a good predictor of

TABLE 3: Lifestyle, appetite, and functional eating characteristics among participants (n=70)

No.	Variable	Category	F	%
1.	Appetite status	Normal	18	25.70
		Reduced	52	74.30
2.	Difficulty chewing/swallowing	Yes	37	52.90
		No	33	47.10
3.	Physical activity	Active	26	37.10
		Inactive	44	62.90
4.	Sedentary time (h/day)	<5 h	12	17.10
		≥5 h	58	82.90
5.	Sleep duration	<6 h	14	20.00
		6–8 h	41	58.60
		>8 h	15	21.40
6.	Smoking status	Yes	24	34.30
		No	46	65.70
7.	Alcohol consumption	Yes	8	11.40
		No	62	88.60
8.	Social activity	Active	29	41.40
		Inactive	41	58.60
9.	Peace of mind level	Very low	1	1.40
		Low	14	20.00
		Moderate	37	52.90
		High	18	25.70

TABLE 4: Chronic diseases, medication use, and multimorbidity profile among participants (n=70)

No.	Variable	Category	F	%
1.	Presence of chronic disease	Yes	69	98.60
		No	1	1.40
2.	Which of these disease do you have?	Hypertension	34	49.28
		Diabetes mellitus	18	26.9
		Vision problems+hearing problems	3	4.35
		Heart disease+kidney disease	6	8.7
		Hypertension+diabetes mellitus	8	11.59
3.	Duration since diagnosis	<1 year	2	2.90
		1–5 years	24	34.30
		>5 years	43	61.40
		Not reported	1	1.40
4.	Currently taking medication	Yes	50	71.40
		No	20	28.60
5.	Frequency of medical check-up	Every 3–6 months	1	1.40
		Only when needed	69	98.60
7.	Multimorbidity (≥2 conditions)	Yes	46	65.71
		No	24	34.29

TABLE 5: Association between socio-demographic characteristics and selected health outcomes among participants (n=70)

No.	Variable	Outcome	Key finding	χ^2	P-value
1	Gender	BMI category	Higher obesity among females (41.38%) versus males (14.63%)	14.90	<0.01
2	Age	Chewing/Swallowing difficulty	Higher prevalence in older groups (77–99 years: Up to 85.71%)	13.55	<0.01
3	Gender	Peace of mind level	Higher not peace of mind levels among females (48.28%) versus males (9.76%)	13.86	<0.01
4	Marital Status	Peace of mind level	Higher not peace of mind among widowed participants (41.38%)	18.25	0.03

BMI: Body mass index

TABLE 6: Regression analysis of predictors of cardiometabolic outcomes among participants (n=70)

No.	Outcome variable	Predictor	β /OR	95% CI	P-value
A. Systolic blood pressure (SBP)					
1	SBP	BMI	0.26	0.03 to 0.49	0.03
2	SBP	Waist circumference	0.25	0.01 to 0.49	0.04
3	SBP	Blood glucose	0.24	0.02 to 0.46	0.03
B. Blood glucose					
4	Blood glucose	Iron	-0.29	-0.53 to -0.05	0.02
C. Hypertension status (logistic regression)					
5	Hypertension	BMI	1.20 (OR)	1.03 to 1.40	0.02
6	Hypertension	Waist Circumference	1.05 (OR)	1.01 to 1.09	0.01
7	Hypertension	Blood Glucose	1.02 (OR)	1.00 to 1.04	0.04

β : Standardized regression coefficient, OR: Odds ratio, 95% CI: 95% confidence interval, BMI: Body mass index, SBP: Systolic blood pressure. Only statistically significant predictors ($P < 0.05$) are presented. Multiple linear regression was used for continuous outcomes (SBP, blood sugar), while logistic regression was used for hypertension status

TABLE 7: Cardiometabolic risk stratification, clustering, and predictive performance among participants (n=70)

No.	Variable	Category/Indicator	F	%	Key Statistic
A. Nutritional risk stratification					
1	Nutritional risk	Low risk	11	15.71	—
		Moderate risk	21	30.00	—
		High risk	24	34.29	—
		Very high risk	14	20.00	—
B. Cardiometabolic risk clustering					
2	≥1 risk factor	Yes	70	100.00	—
3	≥2 risk factors	Yes	64	91.43	—
4	≥3 risk factors	Yes	38	54.29	—
5	≥4 risk factors	Yes	18	25.71	—
6	All 5 risk factors	Yes	6	8.57	—
C. ROC Analysis (Waist Circumference → Hypertension)					
7	AUC	—	—	—	0.81 (95% CI=0.71–0.91; <i>P</i> <0.01)
8	Optimal cut-off	≥88 cm	—	—	
9	Sensitivity	—	—	—	82.69
10	Specificity	—	—	—	72.22
11	Positive predictive value	—	—	—	89.58
12	Negative predictive value	—	—	—	59.09
13	Diagnostic accuracy	—	—	—	80.00

Values are presented as frequency (F) and percentage (%). Nutritional risk levels were categorized based on composite dietary and clinical indicators. Cardiometabolic risk clustering reflects the accumulation of major risk factors (obesity, hypertension, hyperglycemia, dyslipidemia, and central obesity). ROC: Receiver operating characteristic, CI: Confidence interval, AUC: Area under the curve (reported with its 95% confidence interval); J=Youden Index. Statistical significance was considered at $P < 0.05$

hypertension, area under the curve (AUC) = 0.81, 95% CI = 0.71–0.91, $P < 0.01$; optimal cut-off ≥ 88 cm. Sensitivity was 82.69%, specificity 72.22%, positive predictive value 89.58%, negative predictive value 59.09%, and overall

diagnostic accuracy 80.00%, supporting the practical utility of WC for the early screening of hypertension in older adults (Table 7).

5. DISCUSSION

The present study examined dietary patterns and chronic illnesses among residents of a geriatric home in Sulaymaniyah City, Iraq. The findings showed that residents' diets were monotonous and limited in diversity and that chronic diseases such as hypertension and diabetes were common. Vitamin D and iron deficiencies were also frequent, and a considerable number of cardiometabolic risk factors was associated with BMI and metabolic markers.

Understanding the nutritional status and health profile of older adults is particularly important in Sulaymaniyah City, where geriatric care services are limited and nutritional assessment is not routinely incorporated into practice in geriatric homes. Limited research has been conducted on dietary patterns and the chronic illness burden in geriatric homes, even though the older adult elderly population in the Kurdistan Region is increasing. There is a lack of research on the cultural, institutional, and economic factors that influence the nutrition of older adults in Middle Eastern geriatric homes, as much of the previous research has focused on Western and high-income populations. In view of this gap, the objective of the present study was to evaluate the dietary patterns and chronic illnesses of residents of a geriatric home in Sulaymaniyah City.

The demographic profile of the present sample is typical of older populations in the Middle East and elsewhere, consisting mostly of older men with low levels of education and a history of prolonged residence in geriatric homes [26]. A large percentage of people without a personal source of income emphasizes the economic fragility of this group, while the majority of those who have been widowed or divorced represent the social disintegration that is common among institutionalized seniors. These features are consistent with international trends indicating that older adults in geriatric homes frequently face social deprivation, financial difficulty, and dependence on institutional support [27].

Low diversity, nutrition, minimal physical exercise, and restricted exposure to sunlight are common problems among older adults in geriatric homes, and their clinical manifestations include overweight and obesity, low vitamin D

levels, and elevated blood pressure. Similar findings have been reported elsewhere, suggesting that comparable dietary and cardiometabolic problems affect older populations internationally [28], [29]. The high prevalence of vitamin D insufficiency is of particular concern. Sunlight exposure and outdoor activity were not directly measured in the present study; however, this finding is consistent with the limited outdoor activity that is typical of geriatric homes. Supervised outdoor activity programs and routine Vitamin D supplementation are therefore recommended in these settings.

The findings showed a marked lack of dietary diversity, with very low intake of fish, vegetables, and fruit and high intake of carbohydrates and sweets. This pattern is consistent with reports [30] of frequent constraints on nutritional diversity in other geriatric homes, including budget limitations, food procurement regulations, and resident preferences. This is of particular concern given the high prevalence of diabetes in this group. Daily consumption of sweets and the frequent addition of sugar to food and beverages may contribute to suboptimal glycemic control [23]. It should be noted, however, that most residents (65.70%) had acceptable blood glucose levels, whereas a substantial minority (34.30%) had elevated values (≥ 140 mg/dL), indicating suboptimal control in a sizeable subgroup rather than in the sample as a whole.

Dehydration is a common and frequently overlooked problem in older adults that can exacerbate chronic illness and increase the risk of acute complications. Inadequate hydration was a major nutritional concern in the present sample, as 94.30% of participants rarely consumed six or more cups of water per day. These dietary patterns indicate a need for specialized nutritional counselling and educational initiatives for older adults in Sulaymaniyah.

The lifestyle and functional findings showed that most residents had reduced appetite and difficulty chewing or swallowing, both of which commonly compromise adequate nutrient intake in older adults. High levels of physical inactivity and prolonged sedentary behavior significantly raise the risk of cardiometabolic disease and functional impairment in this population. Comparable trends have been recorded in geriatric homes worldwide [31], and a clear need exists for rehabilitation programs incorporating physical activity.

The high prevalence of moderate to high levels of not peace of mind, particularly among female residents and

those who have lost a spouse, suggests a substantial psychological and social burden that may compound already poor health outcomes. These findings highlight the need to incorporate mental health and psychosocial support services into geriatric care, since the emotional health of older adults is linked to their nutritional status and to the management of chronic illness. Global data indicate that older adults in geriatric homes commonly carry a higher burden of chronic illness than their community-dwelling counterparts [32], [33]. The present study likewise identified a considerable frequency of chronic disease and multimorbidity. The prevalence of hypertension and diabetes reflects the cardiometabolic risk profile of this population, and geriatric homes should promptly evaluate residents for cardiovascular disease and other chronic illnesses.

Preventive care appears markedly limited in this geriatric home, as 98.60% of participants sought medical consultation only when unwell rather than at regular intervals. This pattern, together with the high prevalence of multimorbidity, highlights the importance of implementing regular monitoring and integrated chronic illness management programs to improve health outcomes for older residents.

According to the regression analysis, there is strong evidence connecting central obesity and metabolic dysfunction to an increased risk of cardiovascular disease. Specifically, blood sugar, WC, and BMI were shown to be significant predictors of hypertension and SBP. WC has a high AUC of 0.81 and an ideal cut-off of 88 cm, demonstrating its usefulness as a straightforward and efficient screening tool for the risk of hypertension in the elderly.

Additional research is needed to determine the exact nature of the relationship between iron status and glycemic control, since there is a negative correlation between the two variables. To identify high-risk patients and guide focused therapies for cardiometabolic risk reduction, it is crucial to integrate anthropometric and biochemical tests into regular geriatric care. These results underscore this relevance.

Although this study provides useful insights, several limitations should be acknowledged. A cause-and-effect relationship between dietary habits and chronic illness cannot be inferred owing to the cross-sectional design. The results may not be generalizable to other older populations because of the limited sample size and single-center setting. Selection and recall bias are also possible, given the use of

self-reported dietary data and convenience sampling. In addition, dietary intake was captured using a structured food-frequency table with predefined response categories rather than open-ended, quantified intake, and the amounts consumed were therefore not measured precisely. Self-rated peace of mind was assessed with a single self-report item rather than a validated multi-item scale, which limits the precision of this measure. It should also be noted that chronic disease in older adults is shaped largely by cumulative, lifelong dietary exposure rather than by current intake alone; the present cross-sectional data may therefore not capture the earlier nutritional history most relevant to disease etiology. To confirm and extend these findings, future studies should employ objective and quantified dietary assessment tools, larger multi-center samples, and longitudinal designs. For the health of older adults in the Kurdistan Region of Iraq, it is strongly recommended that geriatric homes institute programs for chronic illness management, dietary education, and routine nutritional screening.

6. CONCLUSION

The study found that residents of the geriatric home in Sulaymaniyah City had a high prevalence of hypertension, diabetes, and multimorbidity, together with monotonous and dietary diversity was limited. A high prevalence of vitamin D and iron deficiency was observed, and BMI, WC, and blood glucose were significant predictors of cardiometabolic risk. The findings underline the need to integrate systematic nutritional assessment, nutritional education, and routine chronic disease screening into the care of older adults in geriatric homes. Healthcare providers, administrators, and policymakers should work to establish comprehensive geriatric nutrition programs and training initiatives to identify and address nutritional deficiencies and chronic diseases at an early stage. Targeted dietary and lifestyle interventions may improve health outcomes among older adults residing in geriatric homes in the Kurdistan Region of Iraq. Future studies should use longitudinal and interventional strategies to determine the effectiveness of these therapies.

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