

Nutritional and Functional Assessment of Hospitalized Elderly: Impact of Sociodemographic Variables in Babil, Iraq

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ABSTRACT

Background: : Malnutrition is a common condition in older people. Growing evidence showed a high prevalence of malnutrition and functional decline among hospitalized elderly patients. This is primarily due to challenges in identifying and appropriately managing at-risk patients. **Aim:** To assess the nutritional and functional status of hospitalized elderly and to study their associations with sociodemographic variables. **Methodology:** A cross-sectional study was carried out on 300 elderly patients admitted to Murjan Teaching Hospital in Babil governorate\ AL-Hilla City, Iraq. The data was collected from the beginning of March to the end of August 2024. A well-structured questionnaire was used to gather information about the participants' sociodemographic features. Comprehensive geriatric assessments, including nutritional and functional evaluations, were done according to the nutritional checklist and Barthel index. Data were analyzed using the SPSS program version 26. **Results:** The mean age of the study elderly was 71.38 ± 8.807 years. The largest age category was 60-69 years (43.7%), and 58% were females. According to the nutritional checklist, 77.7% of participants were at high risk, 18.7% were at moderate risk of malnutrition, and 3.7% had good nutritional status. The Barthel index score showed that 44.3% of the elderly had poor functional activity, 25.3% had limited functional activity, and 30.3% had good functional activity. There was a significant association of functional decline with age, education, occupation, marital state, income, and absence of close friends ($p < 0.05$). A significant association was noticed between sexual activity and both nutritional and functional status ($p < 0.05$). **Conclusions:** A high proportion of hospitalized elderly patients are at risk of malnutrition and functional decline. Older age groups, widows, illiterate individuals, and low-income individuals without close friends were risk factors for poor functional ability.

Keywords: Sociodemographic Variables, Hospitalized Elderly, Risk of malnutrition.

Article Information

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1. INTRODUCTION

In recent years, with demographic change, the numbers and proportion of elderly people have increased worldwide. As a result, healthy aging has become an increasingly important issue both on an individual level and for societies ^(1,2). The global number of elderly is projected to rise from an estimated 524 million in 2010 to nearly 1500 million in 2050, with

the highest proportion of aging populations in developed countries ^(3,4). In Iraq, the annual statistical report issued by the Iraqi Ministry of Health reflected that the proportion of elderly people over 60 is expected to rise from 3.4% in 2010 to 5% in 2015 and reach 7.2% in 2050 ⁽⁵⁾. Aging is the process of becoming older, characterized by a range of physical, mental, and social changes that occur over time. Aging

is one of the most significant known causes of many human diseases. Although no specific numerical standard is set by the United Nations (UN), it has been agreed that the cutoff is 60+ years when referring to the older population. It represents a more accurate portrayal of significant life changes like retirement from work, loss of one's spouse, and social isolation (6). Aging is often associated with multiple health conditions and physical impairments, such as sarcopenia, frailty, dementia, and malnutrition. Among these, malnutrition is prevalent, particularly among hospitalized elderly patients (7,8). Hospitalized older patients are at greater risk of malnourishment as their acute illness demands an increased nutritional requirement. The prevalence of hospital malnutrition or the risk of malnutrition in elderly patients is considerable (30–50%)(9,10). A study conducted in Iraq to assess the elderly's nutritional status found that 24% of them were malnourished, and 48.8% were at risk of malnutrition. This is mainly attributed to difficulties in identifying and appropriately managing patients who are at risk in identifying and appropriately managing at-risk patients (11).

Several factors contributed to making malnutrition more frequent in this group of patients, including issues related to food intake, such as a limited variety of foods and the presence of underlying diseases or inflammatory conditions. Malnutrition is linked to worse clinical and functional outcomes and increased morbidity and mortality. Therefore, maintaining good nutritional status is crucial for health and well-being, as it helps delay the onset of diseases, preserves functional independence, and thus promotes continued independent living (12,13).

Growing evidence in the previous literature suggests that nutritional status is closely related to the functional status of older hospitalized patients. Malnutrition and a decline in functional ability are two major factors

contributing to losing independence with aging (14). Improving nutritional status and proper diet management could enhance older persons' functional ability (15). So, a thorough dietary assessment and appropriate interventions to prevent functional decline need to be emphasized. Malnutrition is a global health problem affecting over a billion people of any age group (16). Despite its widespread prevalence, significant confusion has been caused by its definitions and terminology. According to the World Health Organization (WHO), malnutrition is defined as deficiencies, excesses, or imbalances in a person's intake of energy or nutrients (17).

In the clinical setting, malnutrition has been referred to as inadequate intake or uptake of nutrients. It leads to changed body composition and cell mass, resulting in decreased physical and mental function and poor clinical outcomes(18).

Objectives of the Study:

1. To assess the nutritional and functional status of hospitalized elderly.
2. To identify the impact of sociodemographic variables on the nutritional and functional status of hospitalized elderly.

2. METHODS

2.1 Study design: -

A descriptive cross-sectional study with analytic elements.

2.2 Study population and setting

The study population represents old-age patients (≥ 60 years old) admitted to Murjan Teaching Hospital in Babil governorate\ AL-Hilla city. The data were collected from the beginning of March to the end of August 2024.

2.3 Inclusion criteria:

Hospitalized elderly patients ≥ 60 years old who were admitted to Murjan Teaching Hospital in Hilla City.

2.4 Sampling technique and size: -A convenient sampling technique was used to

collect the data. The sample size was calculated using the following equation:

$$\text{Sample size (n)} = \frac{(z^2 * p * q)}{d^2} = 295$$

Where the proportion of hospitalized elderly patients with good nutrition was (26%) from the previous study, The number of data collected was 300 .

2.5 Data collection: -

Data were collected through direct interviews (face-to-face) with participants using a well-structured questionnaire after explaining the purpose of the study to them and obtaining their consent. The questionnaire items were obtained from related published studies dealing with the same topic. The researcher visited the Murjan Teaching Hospital four days a week for 4-5 hours daily. The interview with each patient lasted about 15-20 minutes.

2.8 Pilot study:

A pilot study was carried out on 30 hospitalized elderly patients admitted to Murjan Teaching Hospital over two weeks to assess the reliability and applicability of the tool to show time needed to complete the questionnaire, test the difficulty of questions if present. to explore any administrative or technical obstacles, to assess the applicability and acceptability of the tool. After the pilot study, no significant changes were made to the study tool apart from trivial modifications. The sample in the pilot study was excluded from the study data analysis.

2.9 Ethical consideration: -

- 1- Permission from Babil Health Directorate and the Murjan Teaching Hospital have been obtained.
- 2- Verbal informed consent was obtained from each patient enrolled in the study after explaining the purpose of this study.

- 3- Data confidentiality was maintained throughout the study.

2.10 STATISTICAL ANALYSIS

Data were entered into an Excel file and then imported to SPSS (version 26 for Windows). A descriptive analysis was performed to determine the personal characteristics of the study population. The association between the nutritional and functional status and sociodemographic characteristics of hospitalized elderly was tested using the Pearson Chi-square test with the application of Fisher Exact test whenever applicable. Statistical significance was considered whenever the P value was equal to or less than 0.05.

3. RESULTS

3.1 Sociodemographic characteristics of the studied sample

A total of 300 elderly patients were enrolled. The mean age of elderly patients was 71.38 ± 8.807 years. The study participants comprised 126 (42%) males and 174 (58%) females. More than half of the participants lived in rural areas, 169 (56.3%) and 131 (43.7%) from urban. Two-thirds of participants, 190 (63.3%) were illiterate, 57 (19%) had primary level of education, 25 (8.3%) were secondary graduate and 28 (9.32%) with collage level of education.

Regarding their marital state, half of the study participants were married 159 (53%), 109 (36.3%) were widows, 7 (2.3%) were divorced, and only 25 (8.3) were single. Most of elderly patients 265 (88.3%) had sibling, and close friend 237 (79%). Out of the total number of samples, 161 (53.7%) were housewives, 99 (33%) were retired, 38 (12.7%) were freelancers, and only 2 (0.7%) were employed.

Less than half of the participants, 137(45.7%), had income sufficient to some extent, 114(38%) had insufficient income, and only 49(16.3%) had sufficient income. Three-

quarters of elderly participants did have no means of transportation, 251(83.7%), and only 49(16.3%) had transportation, as shown in **Table (3.1).**

Table 3.1: - Sociodemographic characteristics of the studied sample.

Variables		N	%
Age group (year)	60-69	131	43.7
	70-79	105	35
	>=80	64	21.3
	Mean $\pm$ SD	71.38 $\pm$ 8.807	
Sex	Male	126	42
	Female	174	58
Educational status	Illiterate	190	63.3
	Primary	57	19
	Secondary	25	8.3
	Collage	28	9.3
Occupation	Retired	99	33
	Housewife	161	53.7
	Freelancer	38	12.7
	Employee	2	0.7
Marital status	Married	159	53
	Single	25	8.3
	Widowed	109	36.3
	Divorced	7	2.3
Presence of sibling	Yes	265	88.3
	No	35	11.7
Economic status	Sufficient	49	16.3
	Sufficient to some extent	137	45.7
	Insufficient	114	38
Residence	Urban	131	43.7
	Rural	169	56.3
Presence of close friends	Yes	237	79
	No	63	21
Transportation	Yes	49	16.3
	No	251	83.7
Total		300	100

3.2 Distribution of the health-related variables of the studied sample

Regarding health-related habits, a high proportion of participants were non-smokers: 224(74.7%), 289(96.3%) of them without regular exercise, 245(81.7%) had no sexual activity, and only 230(76.7%) had good sleep, as shown in **Table (3.2)**.

Table 3.2: -Distribution of the health-related variables of the studied sample.

Variables		N	%
Smoking	Yes	76	25.3
	No	224	74.7
Exercise	Yes	11	3.7
	No	289	96.3
Sleep	Yes	230	76.7
	No	70	23.3
Sexual activity	Yes	55	18.3
	No	245	81.7
Total		300	100

3.3 The Nutritional Screening Checklist (NCL) questionnaire for study participants

In an item analysis of the answers to the Nutritional Screening Checklist (NCL) questionnaire, most elderly participants responded negatively (no). The highest percentage of positive responses (yes) was noted for (74.3%) (have an illness or condition that made you change the kind of or amount of food you eat), and (53.3%) (eat fewer than 2meals per day), (55%) for (eat few fruits or vegetables or milk products) and (77%) for (gained or lost weight in the last six months), as shown in **Table (3.3)**.

Table 3.3: - The Nutritional Screening Checklist (NCL) questionnaire for study participants.

Screening questions		N	%
I have an illness or condition that made me change the kind and/or amount of food I eat	Yes	223	74.3
	No	77	25.7
I eat fewer than 2 meals per day	Yes	160	53.3
	No	140	46.7
I eat few fruits or vegetables or milk products	Yes	165	55.0
	No	135	45.0
I have 3 or more drinks of beer, liquor or wine almost every day	Yes	7	2.3
	No	293	97.7
I have tooth or mouth problems that make it hard for me to eat	Yes	89	29.7
	No	211	70.3

Screening questions		N	%
I don't always have enough money to buy the food I need	Yes	4	1.3
	No	296	98.7
I eat alone most of the time	Yes	89	29.7
	No	211	70.3
I take 3 or more different prescribed or over-the-counter drugs a day.	Yes	142	47.3
	No	158	52.7
Without wanting to, I have lost or gained 10 pounds in the last 6 months.	Loss	223	74.3
	Gain	8	2.7
	No change	69	23.0
I am not always physically able to shop, cook and /or feed myself	Yes	74	24.7
	No	226	75.3

1.4 Barthel self-care index of activities of daily living questionnaire of the studied sample:

The results show that most older people can perform most of their daily activities. Some participants need help performing one or more of these activities, mostly grooming and mobility (66% and 29.7%, respectively). Few participants were utterly unable to perform some of these activities, especially bathing and upstairs (55.5% and 64.3%, respectively), as shown in **Table (3.4)**. **Table 3.4: -Barthel self-care index of activities of daily living questionnaire of the studied sample (n=300)**

Questions		N	%
Bowels	Incontinent	100	33.3
	Occasional accident	14	4.7
	Continent	186	62.0
Bladder	Incontinent	121	40.3
	Occasional accident	11	3.7
	Continent	168	56
Grooming	Need help with personal care	198	66
	Independent	102	34
Toilet use	Dependent	95	31.7
	Need some help but can do something alone	105	35
	Independent	100	33.3
Feeding	Unable	54	18
	Need help cutting, spreading etc.	107	35.7
	Independent	139	46.3
Transfer	Unable	53	17.7
	Major help	55	18.3
	Can sit with minor help	97	32.3
	Independent	95	31.7
Mobility	Immobile	56	18.7

Questions		N	%
	Wheelchair independent	89	29.7
	Walks with help of one person	75	25
	Independent	80	26.7
Dressing	Dependent	94	31.3
	Need help but can do half unaided	119	39.7
	Independent	87	29
Stairs	Unable	167	55.7
	Need help	86	28.7
	Independent	47	15.7
Bathing	Dependent	193	64.3
	Independent	107	35.7

3.5 Nutritional and functional assessment of the studied sample

There were 233 (77.7%) study participants who had a high risk of malnutrition, 56(18.7%) were at moderate risk, and 11(3.7%) had good nutrition. Regarding functional state, less than half of the study participants had poor functional activity, 76(25.3%) had limited function activity, and only 91(30.3%) had good functional activity, as in (Figure 3.1, 3.2)

Table 3.5: Nutritional and functional assessment of the studied sample (n=300)

Nutritional assessment and Functional assessment		N	%
(NCL Category)	Good nutrition (0-2)	11	3.7
	Moderate risk for malnutrition (3-5)	56	18.7
	High risk for malnutrition (6 and above)	233	77.7
(BSI Category)	Mean $\pm$ SD	10.39 $\pm$ 6.93	
	Good functional activity (16-20)	91	30.3
	Limited functional activity (10-15)	76	25.3
	Poor functional activity (<10)	133	44.3
Total		300	100

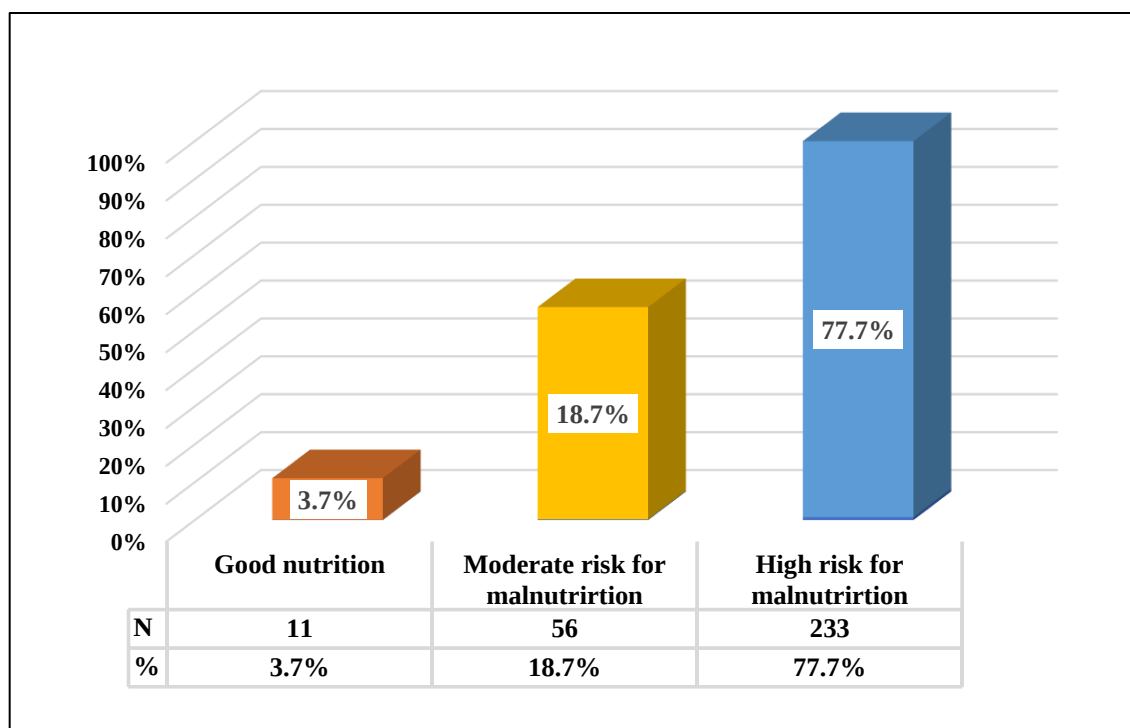


Figure (3.1): Distribution of the studied sample regarding Nutritional state.

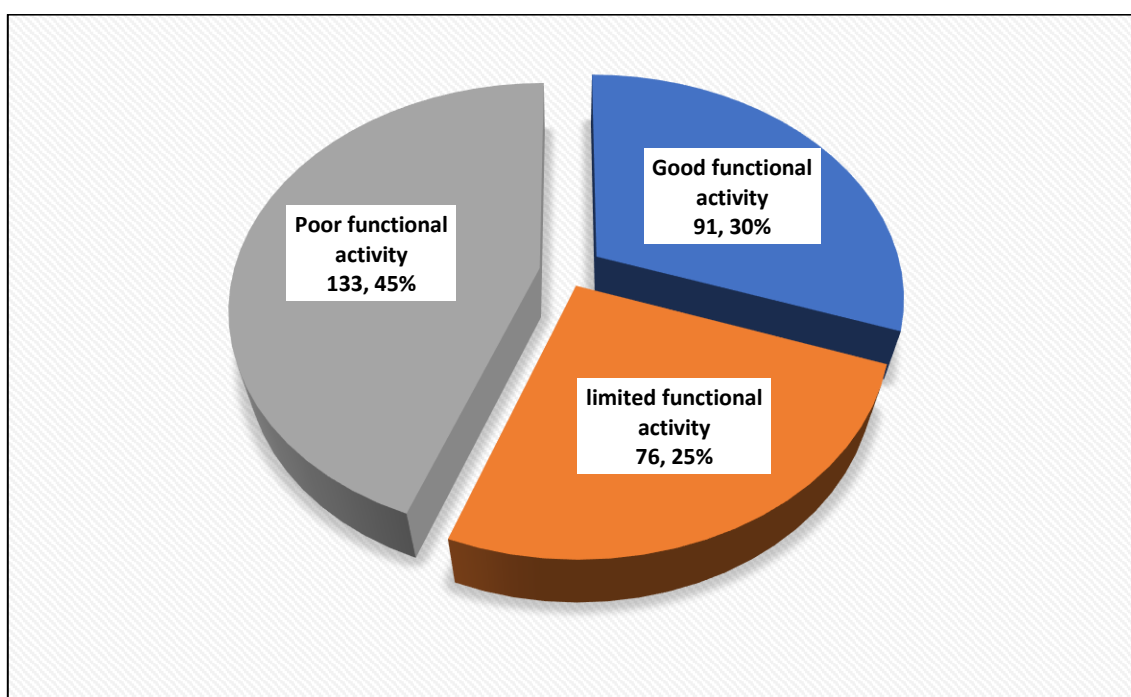


Figure (3.2): - Distribution of the studied sample concerning functional activity

3.6 Association between sociodemographic characteristics with nutritional and functional state of the studied sample: -

The results revealed that the nutritional checklist score was worse with increasing age but without a significant association ($p=0.28$). While age significantly affects BSI, the age group ≥ 80 years had significantly poor functional activity ($p=0.001$). Poor functional activity was also found to be significantly higher in illiterate patients than educated patients ($p=0.001$), while there was no association between NCL and education ($p = 0.35$).

Poor functional activity was significantly higher in widow and divorce participants ($p=0.001$). Also, those without close friends had significantly poor functional activity ($p=0.01$). There was no significant association between residence, presence of siblings, or transportation with NCL and BSI($p<0.05$), as shown in **Table (3.6-3.7)**.

Table 3.6: -Association between sociodemographic characteristics with nutritional state of the studied sample

Variables		Total	NCL						P-value
			Good nutrition (n=11)		Moderate risk (n=56)		High risk (n=233)		
			N	%	N	%	N	%	
Age (year)	60-69	131	5	3.8	30	22.9	96	73.3	0.28
	70-79	105	2	1.9	17	16.2	86	81.9	
	≥80	64	4	6.3	9	14.1	51	79.7	
Sex	Male	174	4	3.2	25	19.8	97	77	0.85
	Female	131	7	4	31	17.8	136	78.2	
Education	Illiterate	190	9	4.7	33	17.4	148	77.9	0.21
	Primary	57	2	3.5	8	14	47	82.5	
	Secondary	25	0	0.0	9	36	16	64	
	Collage	28	0	0.0	6	21.4	22	78.6	
Occupation	Unemployed	260	9	3.5	50	19.2	201	77.3	0.74
	Employed	40	2	5	6	15	32	80	
Economic status	Sufficient	49	0	0.0	9	18.4	40	81.6	0.59
	Sufficient to some extent	137	5	3.6	25	18.2	107	78.1	
	Insufficient	114	6	5.3	22	19.3	86	75.4	
Marital status	Single	25	0	0.0	4	16	21	84	0.13
	Married	37	3	1.9	34	21.4	122	76.7	
	Widows & divorce	116	8	6.9	18	15.5	90	77.6	
Residence	Urban	131	4	3.1	27	20.6	100	76.3	0.68
	Rural	169	7	4.1	29	17.2	133	78.7	
Persence of siblings	Yes	265	11	4.2	51	19.2	203	76.6	0.33
	No	35	0	0.0	5	14.3	30	85.7	
Presence of close friends	Yes	237	10	4.2	47	19.8	180	75.9	0.34
	No	63	1	1.6	9	14.3	53	84.1	
Transportation	Yes	49	0	0.0	9	18.4	40	81.6	0.32
	No	251	11	4.4	47	18.7	193	76.9	

Table 3.7: -Association between sociodemographic characteristics with functional state of the studied sample

Variables		Total	BSI						P-value
			Good function (n=91)		Limit function (n=76)		Poor function (N=133)		
			N	%	N	%	N	%	
Age (year)	60-69	131	64	48.9	28	21.4	39	29.8	0.001*
	70-79	105	23	21.9	31	29.5	51	48.6	
	≥80	64	4	6.3	17	26.6	43	67.2	
Sex	Male	174	46	36.5	27	21.4	53	42.1	0.11
	Female	131	45	25.9	49	28.2	80	46	
Education	Illiterate	190	41	21.6	50	26.3	99	52.1	0.001*
	Primary	57	24	42.1	14	24.6	19	33.3	
	Secondary	25	10	40	8	32	7	28	
	Collage	28	16	57.1	4	14.3	8	28.6	
Occupation	Unemployed	260	70	26.9	70	26.9	120	46.2	0.004*
	Employed	40	21	52.5	6	15	13	32.5	
Economic status	Sufficient	49	31	63.3	8	16.3	10	20.4	0.001*
	Sufficient to some extent	137	42	30.7	38	27.7	57	41.6	
	Insufficient	114	18	15.8	30	26.3	66	57.9	
Marital status	Single	25	11	44	4	16	10	40	0.001*
	Married	37	61	38.4	42	26.4	56	35.2	
	Widows & divorce	116	19	16.4	30	25.9	67	57.8	
Residence	Urban	131	47	35.9	27	20.6	57	43.5	0.10
	Rural	169	44	26	49	29	76	45	
Siblings	Yes	265	79	29.8	70	26.4	116	43.8	0.49
	No	35	12	34.3	6	17.1	17	48.6	
Presence of close friends	Yes	237	81	34.2	55	23.2	101	42.6	0.01*
	No	63	10	15.9	21	33.3	32	50.8	
Transportation	Yes	49	18	36.7	10	20.4	21	42.9	0.50
	No	251	73	29.1	66	26.3	112	44.6	

3.7 Association between health-related variables with nutritional and functional state of the studied sample

The result of the present study also shows that a significant association was found between sexual activity and NSL as well as BSI; those with high nutritional risk and poor functional activity had no sexual activity ($p=0.01$, $p=0.001$ respectively). Also, BSI was significantly worse among participants without regular exercise ($p=0.005$), as shown in **Table 3.8**.

Table 3.8: -Association between health-related variables with nutritional and functional state of the studied sample.

		Total	NCL						BSI					
			Good nutrition (n=11)		Moderate risk (n=56)		High risk (n=233)		Good function (n=91)		Limited function (n=76)		Poor function (n=133)	
			N	%	N	%	N	%	N	%	N	%	N	%
Smoking	Yes	76	4	5.3	15	19.7	57	75	23	30.3	19	25	34	44.7
	No	224	7	3.1	41	18.3	176	78.6	68	30.4	57	25.4	99	44.2
P-value			0.64						0.99					
Exercise	Yes	11	0	0.0	1	9.1	10	90.9	8	72.7	0	0.0	3	27.3
	No	289	11	3.8	55	19.	223	77.2	83	28.7	76	26.3	130	45
P-value			0.53						0.005*					
Sleep	Yes	230	8	3.5	47	20.4	175	76.1	75	32.6	59	25.7	96	41.7
	No	70	3	4.3	9	12.9	58	82.9	16	22.9	17	24.3	37	52.9
P-value			0.35						0.2					
Sexual activity	Yes	55	0	0.0	17	30.9	38	69.1	33	60	10	18.2	12	21.8
	No	245	11	4.5	39	15.9	195	79.6	58	23.7	66	26.9	121	49.4
P-value			0.01*						0.001*					

4.DISCUSSION

Older people are the fastest-growing part of the global population and often face multiple organic, psychological, and social problems ^(19,20). Malnutrition is a significant public health problem that is more common among older people than the general population, particularly in hospitalized elderly patients. However, it often goes unnoticed. So, early detection and prompt interventions are essential for preventing malnutrition in this group ^(21, 22,23). Therefore, the current study assessed the nutritional

status and performance of daily living activities for hospitalized elderly patients. In the present study, the highest proportion of elderly patients were illiterate females within the age group (60-70 years). According to NCL, 77.7% of elderly participants had a high risk of malnutrition, and 18.7% had a moderate risk. In line with this result, a previous report on the Asian population elucidated that the prevalence of malnutrition ranges from 16% to 78% among hospitalized seniors ⁽²⁴⁾. A survey in Egypt among 200 elderly patients aimed to assess the nutritional

and functional status of hospitalized elderly found that 56% of the elderly were at high risk of malnutrition and 18% were at moderate risk ⁽¹⁹⁾. Another study performed by Shrestha et al. ⁽¹⁵⁾ demonstrated that the overall prevalence of high and moderate nutritional risk was (48.5% and 31.5%, respectively).

Moreover, a recent study in India illustrated that among 200 hospitalized elderly patients, 22.5% were severely malnourished, according to the MNA screening tool ⁽¹⁰⁾. Malnutrition is a prevalent problem among older adults due to multiple factors, including decreased appetite, changes in energy expenditure, fluid and electrolyte imbalances, cytokine and hormone level fluctuations, delayed gastric emptying, and diminished senses of taste and smell ⁽²⁵⁾. The variation in reported prevalence rates across different studies is likely owing to various factors, including differences in the nutritional assessment tools used and sociodemographic characteristics of the study participants, study design, study periods, and local factors, such as the health systems in different countries and the standards of medical treatment received. Nutrition is a crucial factor contributing to health and functional ability. Malnourished elderly patients are more likely to require health and social services, experience prolonged hospitalizations, and place additional burdens on caregivers ⁽²⁶⁾. According to the Barthel self-care index for activities of daily living in this analysis, less than half of the elderly participants had poor functional activity, and a quarter of them had fair functional activity. Compared with this result, a study in Nepal carried out on 165 older persons showed that 59.4% were dependent, 25.5% needed help, and only 15.2% were independent ⁽¹⁵⁾. A cross-sectional study in Spain involving 239 individuals aged 70 and above found that 7.5% had low

dependence, 19.7% had moderate dependence for some basic activities of daily living, 22.2% had severe dependence, and 15.5% were totally dependent ⁽²⁷⁾. The diversity in patient characteristics, including age and the definition of functional decline or impairment of the activity of daily living, may affect the differences between the results from the previous studies and ours.

Several factors related to malnutrition in elderly patients were elucidated in the present study. It found that the prevalence of nutritional risk was higher in patients over 70 years but without significant association ($P=0.28$). This corresponds with findings from Golandaz et al. ⁽²⁸⁾ and Fang et al. ⁽²⁹⁾, who revealed an association between NCL score and age group. Also, Yap et al. ⁽³⁰⁾ illustrated no significant association between nutritional risk and age, but higher nutritional risk was found in older patients. Meanwhile, Sami et al. stated that patients at risk of malnutrition were not older than those without risk ⁽³¹⁾. Nutritional status can quickly deteriorate due to physiological changes with age. Aging and age-related medical conditions can lead to a decreased food intake, an exaggerated decline in taste and/or olfactory perception, and a consequent reduction in appetite and cognitive changes. Additionally, previous literature revealed that the association between age and malnutrition is indirect, which may stem from co-existing diseases and multi-medication in the oldest age groups ^(32,33).

Regarding sex, there was no significant sex difference in the prevalence of nutritional risk. A similar result was documented by Fang et al. ⁽²⁹⁾ and Kavya et al. ⁽²⁶⁾. In contrast, a study in Egypt showed increased nutritional risk in males compared to females ⁽¹⁹⁾. Also, the current study's findings confirm previous findings regarding the lack of a relationship between malnutrition and educational and marital status ($p<0.05$). It is

possible that an extraneous variable, such as socioeconomic status, could influence nutritional status, as it limits access to various foods and affects the relationship between education, marital status, and malnutrition⁽³⁴⁾. However, in this study, socioeconomic status was not found to impact the risk of malnutrition. This analysis also demonstrated that those who didn't have siblings and close friends were more likely to be at high risk of malnutrition without significant association ($p>0.05$). Similar findings were reported in studies conducted in Egypt and Nepal^(15,19). Also, a cross-sectional study conducted in Turkey showed that the risk of malnutrition was higher in individuals who lived alone⁽³⁵⁾. Controversially, O'Shea et al.⁽³⁴⁾ revealed that those living with others were more likely to be malnourished than those living alone. Nutritional deficiency is a critical problem for the elderly living alone, as access to food and shopping is more difficult for older people. It is also anticipated that the positive influence of social interaction and companionship during mealtimes could enhance appetite and enjoyment of food. So, the possibility of nutritional deficiency increases in lonely elderly individuals who cannot receive support^(36,37).

In terms of determining the relationship between sociodemographic parameters and functional activity, the current study revealed a significant association between functional activities and advancing age, where functional activity decreased with advancing age. Likewise, a survey by Shrestha et al.⁽¹⁵⁾ and Villafañe et al.⁽²⁵⁾ observed that the number of patients with better functional status decreases with aging. A longitudinal Study in India performed by Chauhan et al.⁽³⁸⁾ stated that age is one of the strongest

predictors of poor daily living activity among the elderly; the risk of severe impairment increases with an increase in the age of the elderly. Furthermore, Esmayel et al.⁽¹⁹⁾ also reported a significant association between disability and age; functional activity declines with advancing age. The plausible explanation might be that as age advances, there is a deterioration in the integration of multiple physiological systems in our body. Older people are more fragile and highly susceptible to chronic diseases as well as loss of muscle mass and concomitant strength loss, which is, in turn, if left inadequately treated, all of these can limit the mobility of elderly individuals and lead to functional decline⁽³⁷⁾. Educational level was another predictor for poor functional activity; illiterate patients had significantly poorer functional activity than their counterparts. Similarly, Chauhan et al.⁽³⁸⁾ found that the risk of disability was lower among the elderly with higher education than their uneducated counterparts. Meanwhile, Esmayel et al.⁽¹⁹⁾ documented no association between functional disability and education. The association between functional disability and the education status of the elderly is also well established. It believes increased resource availability linked to higher education may improve self-perception and decrease limitations with different health conditions⁽³⁹⁾. Moreover, the level of education might affect the level of knowledge for prevention and management; they can apply primary and secondary prevention⁽⁴⁰⁾.

Functional activity was found to be significantly decreased with decreasing income in this study, which was in accordance with the results by O'Shea et al.⁽³⁴⁾ and Shrestha et al.⁽¹⁵⁾, where there is a

significant association between functional activity and income. However, such an association was not found in the study in Egypt; no significant association was documented.

between disability and income ⁽¹⁹⁾. Unsurprisingly, low-income ones will not have the same chances for good food, exercise, medical care, and services ⁽⁴¹⁾. Social relationships are pivotal for healthy aging and have been previously linked to a greater chance of maintaining physical health and longevity. On the other hand, loneliness is a risk factor for physical illness, fatigue, and physical impairment ⁽⁴²⁾. The current analyses support previous evidence that older patients who were widows or divorced and did not have close friendships significantly had poor impairment in functional activity. Asim et al. ⁽⁴³⁾ stated that marital status and living with the family were associated considerably with elders' functional status; those living with their spouses or families have a higher functionality level than isolated elders. Moreover, Hajek et al. ⁽⁴⁴⁾ revealed that functional impairment significantly increased with the loss of a spouse. In contrast, Shrestha et al. ⁽⁷⁾ found no significant relationship between functional activity and marital state. This may be explained by living situations reflecting other risk factors, including lower physical activity or multiple falls. Therefore, the availability of a spouse at later ages is a significant source of support in matters related to sickness and emotional support. As the age advanced, a percentage decline was observed in personal care, medical care, household activities, supervision, and transport/mobility. So, there may be higher chances of functional decline in later life ^(43,44).

Health status is another major contributory factor to the functional status of the elderly. Lack of regular exercise was identified as one of the health behaviors that

were significant predictors for functional decline; the patients who didn't have the habit of exercise significantly had poor functional activity. Similarly, Asim et al. ⁽⁴³⁾ and Harrison et al. ⁽⁴⁵⁾ observed that low physical activity, like exercise, is a risk of functional decline. A community-based cross-sectional study conducted among older adults in Ethiopia revealed that exercise can reduce the occurrence of functional disability ⁽³⁷⁾. Moreover, a meta-analysis was performed to determine the effect of exercise on the physical function and activities of daily living for older adults and found that exercise positively influenced performance in activities of daily living in older adults ⁽⁴⁶⁾. The possible explanation might be that regular exercise is important in preventing functional disability because its effects enhance muscle function, range of motion, balance, and coordination. A previous study revealed that exercise can prevent or delay the development of chronic conditions, increase bone density, and encourage social interaction that decreases the occurrence of functional disability ^(37,38).

Sexuality, which has the potential to cause or be affected by health problems, is also an essential issue for evaluation in all aspects among older patients ⁽⁴⁷⁾. The current study illustrated that the elderly with poor nutritional and functional states had significantly no sexual activity. Similarly, a cross-sectional study performed by von et al. ⁽⁴⁸⁾ found that being underweight was an independent predictor of sexual dysfunction. A healthy diet contributes to positive mood and well-being, and happiness contributes to oxytocin release, which regulates sexual behavior. Also, a study in Taiwan demonstrated that sexual activity was significantly associated with self-reported daily activities; the sexually active group had fewer disabilities in daily activities ⁽⁴⁹⁾. In contrast, a longitudinal study in Sweden on

self-stated sexual activity among 1680 participants who were 60 years and older found that low personal activities of daily living did not have an impact on sexual activity ⁽⁵⁰⁾.

A strength of this study lies in the availability of data regarding nutrition and health status, which was gathered using the Nutrition Screening Initiative as a nutrition screening tool to identify nutritional risks among older adults. The questionnaire was designed to be self-administered but could also be administered by a healthcare professional. Additionally, conducting face-to-face interviews to complete the questionnaire enhanced the reliability of the results, as the questions could be clarified if needed.

5. CONCLUSIONS

1. Most of hospitalized elderly patients were susceptible to high risk of malnutrition.
2. Less than half of hospitalized elderly patients had poor functional ability to perform daily living activities.
3. Increasing age was noted to be associated with a high prevalence of malnutrition risk and functional decline but with a significant difference only in functional activity.
4. Illiterate, unemployed, and low-income elderly patients were significantly more willing to have poor functional activity.
5. Poor functional activity was higher in the elderly who were widows and had no close friends.
6. Nearly half of hospitalized elderly patients who lack exercise had significantly poor functional activity.
7. A high proportion of elderly patients with poor nutritional and functional status had no sexual activity.

6. RECOMMENDATIONS

1. Enhance the strategies for implementing routine functional assessment and nutritional screening for all older patients admitted to the hospital, especially in rehabilitation, to identify patients with functional disability and at risk of malnutrition.
2. Health promotion and education for elderly patients and their caregivers on the importance of maintaining proper nutrition after discharge, focusing on easily achievable dietary recommendations and meal-planning strategies.
3. A comprehensive, interdisciplinary nutritional care plan should be developed for elderly patients to address their medical and dietary needs and improve their condition.
4. Efforts should be initiated to provide adequate geriatric care sources, develop a home care-dominated system supported by community care, and supplement institutional care aimed at helping the elderly self-manage their daily activities.
5. A community-based study is recommended to develop dietary recommendations for the elderly population and identify this hidden Geriatric Giant in society, as this study was hospital-based.
6. Future research should address specific strategies and guidelines for optimizing the benefits of hospital nutritional interventions and improving patients' functional status.

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