

## Original Article

## Assessment of malnutrition among the internally - displaced old age people in the Tikrit City, Iraq

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### Abstract

**Background:** With the steady increase in the number of older people, the prevalence of chronic diseases, and the health expenditures, the importance of preventing malnutrition is becoming more critical than ever. This study aimed to assess malnutrition among the internally- displaced old age people in Iraq.

**Methods:** A descriptive cross-sectional study conducted between November 2016 and March 2017 at the Dream city camp for the internally - displaced persons in Tikrit city, Iraq. Data was collected using the valid (Arabic) version of the mini - nutritional assessment (MNA) questionnaire. The internally displaced persons (IDPs) interviewed, and the nutritional status assessed via the MNA, body mass index (BMI), mid-arm circumferences (MAC) and calf circumferences (CC) measures.

**Results:** A total of 142 eligible old age persons, of which 40.2% were malnourished, and 35.2% were at risk of malnutrition. Among those with malnutrition, 40% were males, and 60% were females. Concerning comorbidity, 80% with positive malnutrition, had chronic diseases. DM reported a higher prevalence (46.5%) compared to other chronic diseases.

**Conclusion:** The prevalence of malnutrition was high among the old age people resident at the displacement camp in Iraq. Both the deteriorating security situation and the lack of proper services have combined to exacerbate the nutritional status of older persons in displacement camps.

**Keywords:** Malnutrition, Old Age, Mini-Nutritional Assessment, Internally Displaced, Tikrit, Iraq

### Background

Malnutrition is a severe problem among the old age population for its increasing role in raising morbidity and mortality rates [1]. The worldwide prevalence ranged between 1.5 to 66.5%, with an estimated 20% of nursing home residents are malnourished [2]. The World Health Organization (WHO) defines malnutrition as "the cellular imbalance between the supply of nutrients and energy and the body's demand for them to ensure growth, maintenance, and specific functions" [3]. However, there is a significant difference in the definition of malnutrition across the literature. Clinically malnutrition in the elderly is either when the dietary intake is insufficient with essential nutrients or when a disturbance in the intake of protein and calories, which resulted in what is called protein-energy malnutrition (PEM). Three common disorders constitute the

PEM; namely "marasmus, kwashiorkor, and intermediate states of marasmus-kwashiorkor." Marasmus occurs when the intake of both protein and calories is inadequate, while kwashiorkor occurs when the protein intake is inadequate, but the caloric intake is regular [4,5]. Weight loss with marked depletion in both fat stores and muscle mass are the characteristic features of Marasmus; however, the visceral organs remain function well with normal serum albumin [6]. Moreover, low serum albumin and reduced protein in visceral organs represent pre-clinical and laboratory signs for Kwashiorkor [6]. Many demographic, social, economic, and health factors contribute differently to the emergence and development of malnutrition among old age persons [7].

### Overview of Iraqi Situation

Since the US-led invasion in 2003, Iraq has not enjoyed the taste of stability and security. The results of the occupation were disastrous at all levels [8]. About half of Iraq's population forced to leave their homes (at least once) and relocate either outside the country or into another city within the country [8].

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However, the most severe impact was political instability, which created sectarian and ethnic conflicts that tore the country's social fabric [9]. The weakness of the central authority, the external interference, the administrative and financial corruption, the lack of general services and the absence of an impartial and independent judiciary were all influencing factors that helped the emergence of different types of parties and militias working outside the authority of the state [9,10]. The more intensified conflict appeared after the invasion of ISIS to central, west and north of Iraq in mid of 2014. An estimated an over three million forced to displace [11,12]. Tens of invalid camps opened to receive the unplanned waves of internally displaced families.

Report of the Camp Coordination and Camp Management (CCCM) Cluster and REACH initiative showed that "as of December 2017, about 2,780,406 internally displaced persons (IDPs) identified in Iraq" [13]. The author also pointed to the existence of eighty formal camps that housed 580,193 IDPs, of which three percent are elderly [13]. Moreover, the report of (CCCM) Cluster and REACH showed that "the five top reported priority needs were food (76%), employment (50%), clothing (39%), education (40%) and healthcare (35%) respectively" [13]. This study aimed to (1) the prevalence of malnutrition among the internally- displaced old age people in the Tikrit City, Iraq, and (2) to identify the relationship between malnutrition and gender, comorbidity and the accessibility of medical care.

## Methods

Descriptive cross-sectional research proposed to assess the malnutrition among the elderly residents of IDP camps in Iraq. At the time of the study, All Iraqi IDPs aged 65 years and more, available in the "Dream City Camp" and willing to participate interviewed. The "Dream City Camp" for IDPs located in Tikrit city and established in early of 2016. Elderly patients with severe disease, cognitive impairments, and those presented with bedsores or skin injuries are excluded.

Information related to sociodemographic factors (such as age, gender), medical history (such as chronic disease, HT, DM) and the nutritional status was collected using the mini - nutritional assessment (MNA) questionnaire from 24th November 2016 to the end of 30th March 2017. The Mini Nutritional Assessment (MNA®) was first emerged in early ninetens of last century languages to assess malnutrition in old age people [14] MNA has been widely used and validated in about twenty different [15,16].

In this study, we recruited the Arabic version of MNA [17]. The MNA has known by its four different parts; (1) anthropometrical measurements; (2) global assessments; (3) dietary questionnaire; and (4) subjective assessment. MNA gives a score of a total of 30. Patients with a score of less than 17 considered as malnourished. Scores of 17-23.5 referred to patients at risk of malnutrition. The well-nourished old age person who collect more than 23.5 and the ordinary person who collect scores between 24 to 30. A floor scale used to measure the weight in (kg) and the height in (cm). Body mass index (BMI) calculated using the formula: "BMI = kg/m<sup>2</sup> where kg is a patient's weight in kilograms and m<sup>2</sup> is their height in meters squared". Both mid-arm circumference (MAC) and calf circumference (CC) measured in (cm).

## Statistical analysis

Descriptive data presented as the mean (SD). Univariate analysis was used to assess the association between the various factors and outcomes. An independent sample t-test and Chi square test were used to compare between the categorical variable. Statistical analysis performed by using SPSS ver. 16.0 (SPSS Inc., Chicago, IL, USA). Values of  $p < 0.05$  were considered statistically significant.

## Results

### Descriptive analyses (univariate analysis)

Based on the inclusion and exclusion criteria, 142 elderly persons interviewed, of which 64 were men (43.7%) and 80 women (56.3%). More than half (57, 40.2%) of the internally-displaced elderly had malnutrition, and 35.2% were at risk of malnutrition, as shown in (Figure 1).

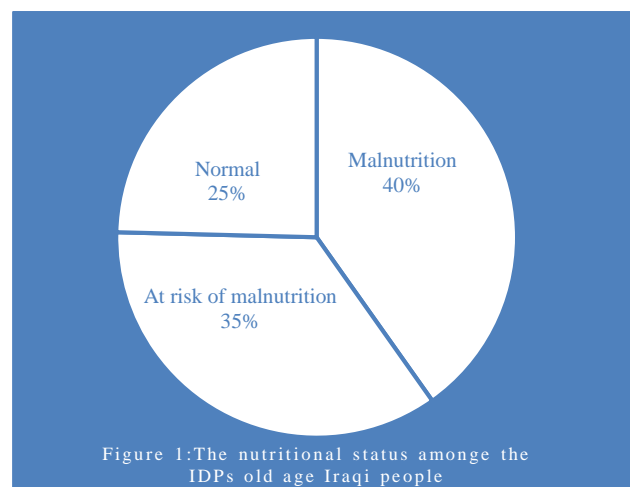


Table 1 showed that the elderly females (34, 59.6%) significantly malnourished and had a higher risk of malnutrition (32, 64.0%) compared to their male counterparts.

**Table 1:** Distribution of nutritional state among the IDPs old age people on gender

Nutritional state	Male	Female	Total	$\chi^2$	p
	N (%)	N (%)	N (%)		
Normal	21(60.0)	14(40.0)	35(24.6)	3.2	0.26
At risk of malnutrition	18(36.0)	32(64.0)	50(35.2)	6.7	0.001
Malnutrition	23(40.4)	34(59.6)	57(40.2)	5.2	0.02

Most of the surveyed old age persons (87, 61.3%) presented with chronic disease. Out of 87 (61.3%) of chronic diseases cases, 37 (64.0%) are malnourished, and 33 (66.0%) are at risk of malnutrition, respectively. Both diabetes mellitus (66, 46.5%) and high blood pressure (34, 24.0%) form the highest proportions, respectively. However, peptic ulcer and renal failure appeared in 19.7% and 11.3%, respectively (Table 2). Moreover, there was no significant association between the type of chronic diseases and the nutritional status; however, DM appeared higher than other chronic diseases in malnutrition (27, 40.9%) and among the cases at risk of malnutrition (21, 31.8%) respectively.

**Table 2** Relation between nutritional state and type of chronic diseases (morbidity and co-morbidity) among the elderly

Nutritional state	Chronic diseases						X <sup>2</sup>	P
	YES	NO	HT	PU	DM	RF		
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)		
Normal	17(48.6)	18(51.4)	10 (29.4)	8(28.6)	18(27.3)	2(12.4)	8.1	0.23
At risk of malnutrition	33(66.0)	17(34.0)	12(35.3)	11(39.4)	21(31.8)	5(31.3)	7.3	0.35
Malnutrition	37(64.9)	20(35.1)	12 (35.3)	9(32.1)	27(40.9)	9(56.3)	8.9	0.57
Total	87(61.3)	55(48.7)	34 (24.0)	28 (19.7)	66(46.5)	16(11.3)		

Table 3 shows that about two-thirds of 63.2% of malnutrition group had no medical care compared to 54.0% of those at risk of malnutrition. However, about 57.1% of those described as normal or healthy persons did not receive any medical care.

**Table 3** Relation between availability of medical care and nutritional state

Nutritional state	Medical care		Total (142) N (%)
	Yes	No	
	N (%)	N (%)	
Normal	15(42.9)	20(57.1)	35(24.6)
At risk of malnutrition	23(46.0)	27(54.0)	50(35.2)
Malnutrition	21(36.8)	36(63.2)	57(40.2)

## Discussion

In this study, the prevalence of malnutrition among old age IDPs residents camp (Tikrit city, Iraq) was 40.2%, and those who are at risk of malnutrition were 35.2%. The prevalence of malnutrition among old age in Iraq far exceeds that reported in most of the high-income and low-income countries, yet it is still below the upper limit of 66.5% [2]. Our findings showed that the frequency of malnutrition in Iraq is higher than results from Spain (2.8%) [18], Portuguese (4.8%) [19], Turkey (2.7%) [20], Iran (12.0%) [21], India (29.4%) [22]. Nevertheless, the prevalence of those at risk of malnutrition is almost similar in most countries of the world [18-22].

However, the results of this study are considered because the data based on a sample of the community that subjected to severe conditions, getting neither enough quantity of food nor the right quality and forced to stay alone or among low-income families in an isolated camp for displaced persons [13]. Moreover, there is also a lack of literature about malnutrition among the old age people resident in nursing homes, hospital setting, and the community-dwelling older persons. Females have been found more susceptible to malnutrition than males. They account for 60% compared with only 40% among the males. This figure may be attributed to genetic, environmental, or other factors that generally affect more females than males and make them more susceptible to malnutrition. Similar results found by earlier studies from Portuguese [19], Iran [21] and India [22], however, the reverse reported by a study from Spain [18]. In this study, most of the malnourished population (80.0%) suffered from chronic diseases. This is may be natural for people with multiple chronic illnesses who take multiple medications. As a result, they are at higher risk for adverse drug reactions and drug-induced malnutrition. This finding conforms with that reported in a study conducted in Turkey [20]. Simsek et al. [20] found that the risk of malnutrition significantly increasing as the number of chronic diseases increased.

Ali Jadoo et al. [23] indicated that the percentage of chronic diseases among the IDPs in Anbar province increased from 18.0% before displacement to 28.0% after displacement.

Providing health care to the displaced was among the top priorities. However, several factors contributed to obstructing this process, including the absence or inefficiency of strategic planning for disaster management, the unplanned rapid displacement, the far distance from the city centers and the instability of IDPs in one place, in addition to the acute shortage of medical personnel and the lack of human and logistical resources. Many of Iraq doctors and other healthcare providers have exposed to the workplace and war-related violence [24]. Findings of the current study showed that most of the elderly respondents did not receive adequate health care during their stay in the displacement camp. A similar finding was reported by Ali Jadoo et al. [23]. The author found that few of the IDP families were able to access the public health care facilities during the displacement period.

One of the strengths of this study is the construction of a validated questionnaire form like an MNA. However, the analysis of the data restricted by three factors; First, the data was collected from one internally displaced camp, which may affect the generalizability of results. Second, its cross-sectional design, which limits conclusions regarding within-person change or direction of causality. Third, the use of a quantitative rather than a qualitative approach for the evaluation of medication use, which may have implied a clear bias as some medication is known to influence appetite and weight.

## Conclusion

High prevalence of malnutrition among old age people residents in a displaced camp in Iraq. About 49.0% of the camp residents are at risk of malnutrition. Most of the malnourished participants (60.0%) are females. Most of the malnourished participants (80.0%) are with chronic diseases. The increase in malnutrition among the camp residents is the evitable consequence of the existing unfavorable health conditions. The results of this study showed the need for all internally-displaced old age people to be screened for nutrition risk. More psychological and medical care need to be provided with special attention should be given to incorporate the IDPs into the outside world. The quality, as well as the quantity of home-delivered meal programs, need to be improved. A further thorough inquiry into the subject under consideration is needed for future researches.

## Abbreviations

IDPs: Internally Displaced Persons MNA: Mini - Nutritional Assessment BMI: Body Mass Index MAC: Mid-Arm Circumferences CC: Calf Circumferences WHO: World Health Organization PEM: Protein Energy Malnutrition ISIS: the Islamic State of Iraq and Syria

CCCM: Camp Coordination and Camp Management DM: Diabetes Mellitus HT: Hypertension Blood Pressure PU: Peptic Ulcer RF: Renal Failure

#### Declarations

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#### Availability of data and materials

Data will be available by emailing nis78reen@yahoo.com

#### Authors' contributions

NMI is the principal investigator of the study who designed the study and coordinated all aspects of the research including all steps of the manuscript preparation. He is responsible for the study concept, design, writing, reviewing, editing and approving the manuscript in its final form. NSK and RST contributed in the study design, analysis and interpretation of data, drafting the work, writing the manuscript and reviewed and approved the manuscript. All authors read and approved the final manuscript.

#### Ethics approval and consent to participate

We conducted the research following the Declaration of Helsinki, and the protocol was approved by the Ethic Committee of Faculty of Medicine, Tikrit University, Iraq (Ref: 1017 at 04-July-2017). Moreover, written informed consent was obtained from each included patient who were willing to participate after explanation of the study objectives and guarantee of secrecy.

#### Consent for publication

Not applicable

#### Competing interest

The authors declare that they have no competing interests.

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