

Nutritional Status and Health-Related Quality of Life Among Elderly in Rural Area in Egypt.

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Abstract

Background: Malnutrition is a global health problem especially in extremes of age. Elderly people are a fast-growing group that is at greater risk of malnutrition due to high prevalence of comorbidities and limited resources available for them. Elderly are more prone to negative effects of malnutrition on quality of life and health outcomes due to their vulnerable nature and this is often preventable.

Aim: To assess the effect of nutritional status on Health-Related Quality of Life (HRQoL) among community-dwelling elderly living in a rural village in Dakahliya, Egypt.

Methods: A cross-sectional study. A random sample of 170 community-dwelling elderly living in Dakahliya. Demographic data were collected, and comprehensive geriatric assessment was done for each participant including history taking, clinical examination, psychological, mental and functional assessment. Assessment of nutritional status was done using the Mini-Nutritional Assessment (MNA) questionnaire and anthropometric measurements. HRQoL was measured using the Short-Form Health Survey-36 items (SF-36) questionnaire.

Results: The present study showed that among the 170 participants; 45(26.5%) of them were malnourished, 69 (40.6%) were at risk of malnutrition and 56 (32.9%) were well nourished, and showed that HRQoL was significantly poorer in malnourished elderly ($P < 0.001$).

Conclusions: The high prevalence of malnutrition highlights the importance of regular screening of elderly at community settings. As improvement in HRQoL is a growing goal for the worldwide health care and the strong effect of nutritional status on HRQoL, nutritional screening and intervention are extremely important especially for elderly.

Keywords: Malnutrition, Quality of life, Elderly, Community-dwelling, Egypt.

Background

World's elderly population is rapidly growing with estimates that the proportion of elderly population over 60 years will double from 11% to 22% in the first five decades of 21st century. The absolute number of elderly is expected to triple from 605 million to 2 billion over this period¹.

Longevity is desirable, but what matters is living with satisfactory Quality of Life (QoL)². QoL is a broad multidimensional concept based on subjective measures of life, while HRQoL is a more specific aspect of QoL that is related to health³. Elderly are at greater risk for developing illnesses, that impair HRQoL⁴.

One of possible potentially modifiable determinants of HRQoL is nutrition, because adequate nutrition can

delay the age-related frailty and functional dependency by preserving muscle mass and immunity in elderly⁵. Malnutrition is defined as state of deficiency, excess or imbalance of a wide range of nutrients, resulting in significant adverse effects on body structure, function and clinical outcome⁶. The reported prevalence of malnutrition in elderly ranged from 23-60% and 5-30% in acute care⁷ and community settings⁸ respectively.

There are several factors that predispose elderly to malnutrition. This includes physiological, social and economic factors, often referred to as "nine D's" (dysphagia, dysgeusia, dementia, depression, diarrhea, poor dentition, disease, dysfunction and drugs)⁹.

Malnutrition has been shown to correlate with higher rates of mortality, longer length and increased cost of hospital stay in elderly ^{10, 11}. Malnourished elderly have two folds increased risk of long-term mortality ¹², three times longer length of hospitalization ¹³, three times higher risk of infection ¹¹, higher costs of hospital care ¹⁴, greater likelihood of hospital readmission after discharge ¹⁵, and greater dependence in activities of daily living (ADLs) ¹⁶. Assessment of nutritional status in elderly could be done through dietary assessment (e.g. 24 hours recall, food frequency questionnaires or diet quality indices) ¹⁷⁻¹⁹, clinical assessment for signs of malnutrition ²⁰, anthropometric measurements (e.g. Body Mass Index (BMI), mid-arm circumference, tricep skin fold thickness and Biometric Impedance Analysis (BIA)) ²¹⁻²⁴ and biochemical markers of malnutrition (e.g. albumin, transferrin, retinol-binding proteins and thyroxine-binding pre-albumin) ²⁵. Malnutrition has a deleterious effect on physical, mental and social functions and may reduce functional capacity and therefore HRQoL ²⁶. On the other hand, excessive eating and poor physical activity also may impair health and cause mental health problems, especially if obesity occurs ²⁷. The relationship between malnutrition and disability are interchanged. Malnourished elderly are at greater risk to be disabled, and disabled elderly are likely to have nutritional abnormalities because of their dependency on the others ²⁸.

Methods

170 subjects were chosen through a stratified random sampling from community-dwelling elderly at a rural village (Al-Menyal / Dakahliya / Egypt). Study was approved by the ethical committee of the Faculty of Medicine, Ain Shams University. Consent was taken from all participants. All participants were subjected to: Comprehensive geriatric assessment including complete history taking, clinical examination, mental (MMSE) ²⁹, psychological (GDS) ³⁰ and functional assessment (ADL and IADL) ^{31, 32}. Nutritional status assessment using MNA, BMI and waist/hip ratio (WHR). Health related quality of life was measurement using SF-36. The MNA consists of 18 items including dietary, anthropometrical and subjective measurements. The MNA correlates well with clinical assessment and objective measures of nutritional status (e.g. BMI, energy intake and vitamin intake). MNA is highly validated with scores reaching high levels of sensitivity (98%) and specificity (96%) ³³. Diagnosis of nutritional status was done using MNA (Identifying those who are malnourished (<17 points) and those who are at risk of malnutrition (17-23.5 points). Subjects with scores (24 points) or more were considered well-nourished ³³.

The SF-36 is a multi-purpose questionnaire that contains 36 questions. Its results are processed into eight-scale profile of scores that reflect eight HRQoL domains (physical functioning, physical limitation, emotional limitation, energy/fatigue, emotional well-being, social functioning, pain and general health). It has proven high efficiency in measuring health with subsequent ability to compare different populations, estimating relative burden of various diseases, identifying and comparing the health benefits produced by different treatments and screening individual patients ³⁴. WHR was calculated by dividing the waist circumference (midpoint between lower border of costal margin and upper border of iliac crest) by hip circumference (widest portion of buttocks) using stretch-resistant tape. According to World Health Organization (WHO), abdominal obesity is identified by WHR more than 0.85 and 0.9 for females and males respectively ³⁵. BMI is used for classification of overweight and obesity in adults. It is defined as individual's weight in kilograms divided by square of height in meters. BMI between 25 and 30 kg/m² implies overweight while BMI greater than or equal to 30 kg/m² implies obesity, which is further divided into 3 classes ³⁶. Participants were then assigned groups according to nutritional status.

Statistical Analysis

Analysis of data performed by using SPSS package version 15.0. Description of data in the form of mean (M) and standard deviation (SD) for all quantitative variables and frequency and percentage for all qualitative variables. Comparison of qualitative variables was done using chi-square test (X²). Significance levels measured according to P value (probability) P>0.05 insignificant, P<0.05 significant, P<0.01 highly significant.

Results

One hundred and seventy community-dwelling elderly subjects from a rural village at Dakahliya participated in the study. The mean (±SD) age of study population was 71.5 (±5.4) years. Among the 170 participants, 45(26.5%) of them were malnourished, 69 (40.6%) were at risk of malnutrition and 56 (32.9%) were well nourished; this categorization was done based on MNA (table 1).

Table 1: Mini-nutritional assessment of the studied cases.

Items	N	%
Well nourished	56	32.9
At risk	69	40.6
Malnourished	45	26.5
Total=170		

Table 2: Demographic characteristics and relation to nutritional status.

Items		MNA groups			P
		Well (N=56)	At risk (N=69)	Mal. (N=45)	
Age (years)		68.1±3.2	70.4±3.3	77.3±5.5	<0.001*^
Sex	Male	32 (57.1%)	24 (34.8%)	15 (33.3%)	0.017*#
	Female	24 (42.9%)	45 (65.2%)	30 (66.7%)	
Marital status	Married	48 (85.7%)	42 (60.9%)	11 (24.4%)	<0.001*#
	Widow	8 (14.3%)	27 (39.1%)	34 (75.6%)	
Education	Illiterate	12 (21.4%)	52 (75.4%)	45 (100.0%)	<0.001*&
	Read& write	30 (53.6%)	16 (23.2%)	0 (0.0%)	
	Below high	9 (16.1%)	1 (1.4%)	0 (0.0%)	
	High	5 (8.9%)	0 (0.0%)	0 (0.0%)	
Residence	With family				
Occupation	Manual	16 (28.6%)	22 (31.9%)	4 (8.9%)	<0.001*#
	Other work	13 (23.2%)	2 (2.9%)	3 (6.7%)	
	Not working	27 (48.2%)	45 (65.2%)	38 (84.4%)	
Income	<1000	7 (12.5%)	48 (69.6%)	45 (100.0%)	<0.001*#
	≥1000	49 (87.5%)	21 (30.4%)	0 (0.0%)	
Smoking	Current	16 (28.6%)	9 (13.0%)	0 (0.0%)	0.002*#
	Ex-smoker	7 (12.5%)	9 (13.0%)	10 (22.2%)	
	Never	33 (58.9%)	51 (73.9%)	35 (77.8%)	
Alcohol					

Table 3: Comparison between MNA groups regarding HRQoL:

Items	Well (N=56)	At risk (N=69)	Mal. (N=45)	P
Physical function	79.4±18.6	78.0±18.6	37.8±24.2	<0.001*
Physical limitation	87.5±16.5	85.9±18.9	40.6±32.5	<0.001*
Emotional limitation	97.6±8.7	85.0±19.4	12.6±22.8	<0.001*
Energy/fatigue	93.1±5.0	75.9±8.0	35.1±17.4	<0.001*
Emotional well being	91.0±5.7	82.1±11.7	31.8±16.9	<0.001*
Social functioning	84.6±12.8	69.7±16.1	52.8±13.3	<0.001*
Pain	83.9±14.8	82.5±15.6	44.1±26.5	<0.001*
General health	94.4±1.7	85.7±9.0	38.3±17.6	<0.001*
Total	88.9±7.5	80.6±10.7	36.6±18.6	<0.001*

Table 4: Correlation between nutritional indices and other factors::

Items	BMI		MNA		WHR	
	R	P	R	P	R	P
Physical functioning	0.247	<0.001*	0.630	<0.001*	-0.062	0.421
Physical limitation	0.294	<0.001*	0.643	<0.001*	-0.008	0.915
Emotional limitation	0.546	<0.001*	0.859	<0.001*	0.253	<0.001*
Energy/fatigue	0.620	<0.001*	0.912	<0.001*	0.330	<0.001*
Emotional Well Being	0.534	<0.001*	0.858	<0.001*	0.237	0.002*
Social functioning	0.500	<0.001*	0.681	<0.001*	0.457	<0.001*
Pain	0.283	<0.001*	0.645	<0.001*	-0.028	0.720
General health	0.626	<0.001*	0.881	<0.001*	0.333	<0.001*
Total QoL score	0.502	<0.001*	0.848	<0.001*	0.197	0.010*
MMSE	0.646	<0.001*	0.949	<0.001*	0.405	<0.001*
ADL [#]	0.664	<0.001*	0.691	<0.001*	0.265	<0.001*
IADL [#]	0.721	<0.001*	0.782	<0.001*	0.324	<0.001*
GDS [#]	-0.705	<0.001*	-0.880	<0.001*	-0.389	<0.001*

According to univariate analysis on data, a statistically significant relationship ($P < 0.001$) was found between lower MNA scores and poorer HRQoL (total score and individual domains) (table 3). Table (4) shows significant relationships ($P < 0.001$) between poor nutritional indices (MNA, BMI and WHR) with risk of depression, cognitive and functional impairment as well as poor HRQoL.

Discussion

Prevalence of malnutrition among this study is 26.5% which is higher than the prevalence found in most research in community-dwelling elderly.

Malnutrition was significantly higher in females (30%) compared to males (21%). A systematic review done by **van der Pols-Vijlbrief et al., 2014**³⁷ and **Donini et al., 2013**³⁸ yielded similar results.

About (75%) of malnourished cases were widowed and almost all of malnourished cases were illiterate. Malnutrition was significantly associated with high age (P -value < 0.001), low income (P -value < 0.001) and unemployment (P -value < 0.001).

Maseda et al., 2017³⁹ stressed on the significant correlation between malnutrition and being “widow”, it may be attributed to “feeling loneliness” and consequent impaired social resources and poor quality of life. **Torres et al., 2014**⁴⁰ and **Krzywińska-Siemaszko et al., 2015**⁴¹ also demonstrated that high age, low education and low income are independent effectors on nutritional status.

This study showed that smoking significantly associated with lower risk of malnutrition (P -value=0.002). A study done by **Nazemi et al., 2015**⁴² noticed a similar relation. This could be explained by the favorable effect of smoking on bowel movements and prevention of constipation. Also, the antalgic effect of smoking and positive effect on mood improve appetite and enhance food intake⁴².

According to this study, significant correlations were found between nutritional status of our sample of community-dwelling elderly living in Dakahliya (both males and females, using MNA) and their HRQoL (using SF-36, total score and individual domains) with P -value (< 0.001).

There were no statistically significant differences between scores of 3 domains of HRQoL (physical function, physical limitation and pain) among (well-nourished) and (at-risk) groups compared to (malnourished) group. This denotes that physical and pain aspects of HRQoL tend to fall only with very low level of nutritional status unlike other psychological domains (Emotional well-being and emotional limitation) and social domain (social function) which are more sensitive to state of nutrition.

Research studying the relation between nutritional status and HRQoL found variable degrees of significance. A cross-sectional study done at Norway by **Kvamme et al., 2011**⁴³ including 3286

community-dwelling elderly found a significant association between risk of malnutrition and impaired HRQoL in both men and women (P -value for men < 0.001 and for women was only 0.02). Elderly men are more prone to malnutrition-related decrease in HRQoL than women.

Another cross-sectional study done at Spain by **Jimenez-Redondo et al., 2014**⁴⁴ studied the relationship between nutritional status and HRQoL in elderly (80-90 years old) and nonagenarians (> 90 years old). In both groups the relationship was significant (P -value=0.012).

A systematic review and meta-analysis of (30) studies by **Rasheed et al., 2013**⁴⁵ addressed the relationship between nutritional status and HRQoL. According to (15) observational studies the relationship was significant (P -value < 0.001). The remaining were interventional studies that were concerned with addressing the benefit of nutritional intervention on HRQoL, the results combined for meta-analysis yielded significant results (P -value =0.002).

Our study also demonstrated significant positive associations between cognitive status (using MMSE) and functional level of elderly (using ADL and IADL) with nutritional status using MNA (P -value < 0.001).

Many studies confirmed the strong positive association between nutrition on mental functions and functional level⁴⁶⁻⁴⁸.

Depression (using GDS) was significantly associated with poor nutrition using MNA (P -value < 0.001). **Saka et al., 2010**⁴⁶ noted the same relationship between depression and malnutrition using MNA score.

Conclusion:

Prevalence of malnutrition is high among community-dwelling Egyptian elderly living in Dakahliya. Malnutrition is associated with higher age, female gender, being widow, low income and unemployment. Significant relationships were found between malnutrition with depression, cognitive impairment and functional dependency. Malnutrition was associated with poorer HRQoL among community-dwelling Egyptian elderly.

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