Original Article

A pilot study on prevalence of malnutrition, pain, depression and anxiety in elderly population in Delhi

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ABSTRACT

Background/Purpose: Aging is a natural, unavoidable process, associated with a reduction in physical, physiological, social and psychological activities of a person. Aging is adversely affecting nutritional as well as mental health status of the elderly population. The objective of the study to assess nutritional, pain and mental health status of elderly living in unban Delhi.

Methods: The community-based study was conducted at the geriatric urban population of Delhi, North India. Predesigned and pretested questionnaires such as Mini nutritional assessment (MNA), McGill pain questionnaire (MPQ), Hamilton depression rating (HAM-D) and Hamilton anxiety rating scale (HAM-A) were used for nutrition, pain, depression, and anxiety respectively.

Results: MNA based results showed that 37% of participants were malnourished, 39% at risk of malnutrition and 24% had a normal nutritional level. MPQ tool depicted 13% of the elderly population having mild pain, 80% as moderate and 7% having severe pain condition. The depression level was found to be 23% mild depression, 38% mild to moderate, 22% moderate to severe and 17% severe depression symptoms on HAD scale. Based on HAR scale, anxiety level was observed as 46% mild, 30% mild to moderate, 14% moderate to severe and 10% severe anxiety conditions.

Conclusion: The results suggest a high prevalence of malnutrition, pain, depression, and anxiety in the elderly living in Delhi. The questionnaires have proven their potential as useful tools in the identification of malnutrition, pain, depression, and anxiety. Thus, trends observed in various health parameters can be utilized for the formulation of further detailed studies in the development of elderly related health policies.

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INTRODUCTION

Aging is considered as a natural process which is defined as the time-dependent decline in the functional capacity of organisms. Aging is associated with changes in physiology, pathology, psychology and social behavior of a person. Due to these changes, the elderly population was found to be more prone to functional impairment of organs, age-associated diseases, malnutrition, physiological as well as psychological problems and physical inability to move which leads to the generation of many other problems.[1-4]

The elderly population is continuously increasing in the world, and it is predicted that in next 30 years, it will rise dramatically.[5] The health of the elderly is a critical component of the health status of a population.[6] In India, geriatric age group constitutes 8.6% of the total population as per 2011 census. Majority of them live in rural India.[7,8] A report by HelpAge India states that India needs to formulate geriatric policies to take into account the rapid increase in the number of elderly, who will make up 20% of the population by 2050. There is an urgent need to highlight the medical problems that are being faced by the elderly people in India, and develop strategies for bring about an improvement in their quality of life. Geriatric syndromes represent common, serious conditions for elderly persons having substantial implications for functioning and quality of life. However, there is lack of formal criteria to define geriatric syndromes. Various risk factors which may be included in multifactorial Geriatric syndromes are cognitive impairment, impaired mobility, pressure ulcers, falls, incontinence, delirium, malnutrition, pain, depression, anxiety, etc.

Malnutrition is defined as a state in which a deficiency, excess or imbalance of energy, protein, and other nutrients cause adverse effects on body form, function and clinical outcome.[9] Aging is generally associated with the presence of low nutrients level in elderly.[3-5] Decreased sense of taste and smell, as well as oral and dental problems, leads to difficulty in chewing and increase in the chances of oral inflammation, unwanted monotonous diet etc, leading to loss or decrease in appetite in the elderly.[10] They are not able to take care of their diet due to limited physical activities and progressive decline in vision. The psychological and socioeconomic conditions during ageing causes decrease in dietary uptake and thereby, impacting their nutritional status. Thus, all these factors contribute to high prevalence of malnutrition in them, worldwide.[11,12] More than 50% of the Indian older population is found to be underweight whereas more than 90% have an energy intake below the recommended allowance.[13] Malnutrition in the elderly is a multi-factorial problem which may change the quality of life. Since malnutrition in the elderly is a modifiable factor, its identification is important to develop and implement policies to eradicate it. Early detection of malnutrition is important to allow targeted nutritional intervention and should be a key component of the geriatric assessment in community-dwelling elderly persons. Malnutrition is generally associated with various health problems such as pain, anxiety, and depression.[4,14,15] Hence, the present study considered nutritional status as one of the major parameters to evaluate the health status of elderly in Delhi population on Mini Nutritional Assessment (MNA) scale.

Secondly, the projected increase in the geriatric population has generated concern regarding the adverse impact of certain painful conditions on their abilities to function normally. International Association for the Study of Pain (IASP) defines Pain as "an unpleasant sensory and emotional experience arising from actual or potential tissue damage or described regarding such damage".[16] Pain is experienced by all age groups people, but there is a need to study its impact especially among elderly. Pain is one of the most widely cited symptoms underlying disability among older adults, and also pain is an outcome of various co-morbid illnesses.[17,18] Pain is a significant clinical issue among elderly as it affects their quality of life (QOL).[19-21] Pain is also found to be associated with a decrease in nutritional status.[14] Therefore, the study sought to determine the prevalence of pain among older adults in Delhi using The McGill Pain Questionnaire (MPQ) scale.

The third parameter which is considered in the study is depression. As age advances, the ability to relax after a stressful event becomes more difficult.[22] Diagnostic and statistical Manual of health disorders (5th edition, DSM-5) defined depression as "a very particular constellation of symptoms including depressed mood, diminished interaction or pleasure, significant weight loss or gain, feeling of worthlessness, guilty, inability of think or concentrate and many others.[23] Similarly, chronic stress has been shown to have a number of negative health impacts, e.g. insomnia, weight gain, an increased risk for heart disease, impaired immune system, digestive systems and central nervous system.[22,24] The various stressful situations in elderly can be related to lifestyle changes, change in financial status after retirement, deterioration of physical abilities, chronic illness, caring or losing a spouse, death of close relatives & friends, loneliness and depression etc.[25] All these conditions contribute to the high level of depression in elderly. Epidemiological studies have shown that the incidence of depression in elderly is ranged from 10% to 15%, and it can reach up to 45% in hospitalized people.[26,27] Only a few studies have been carried out in Delhi on stress among the elderly population. With above background, this research was conducted to study the prevalence of depressive symptoms among geriatric population using Hamilton Depression Rating Scale (HAM-D) scale in elderly Delhi population.

The last parameter which is analyzed in this study is anxiety. Anxiety is defined as "a mental state to a particular situation as personality traits and a psychiatric disorder." The diagnostic and statistical manual of mental disorders (DSM-5) defines Anxiety category under nine disorders which include separation anxiety disorder, specific phobia social, anxiety disorder, panic disorder, generalized anxiety, agoraphobia, and medically induced Anxiety.[23] The level of anxiety can vary with situation, age, and personality. Elders showed more severe anxiety symptoms due to co-morbid chronic conditions. Anxiety affects working efficiency, decrease concentration level and reduce sleep. People with anxiety disorders are not able to face stressful situations, and in extreme cases, they avoid outing and social gathering. These patients also show physical symptoms such as trembling hands, shortness of breath and increase heart rate. Assessment of anxiety helps in diagnosis of mental disease and provides descriptive information that can be utilized for proper planning of treatments for anxiety state. These studies also help to analyze the effect of anti-anxiety medications and therapies. Hamilton Anxiety Rating Scale (HAM-A) is taken into consideration to analyze the anxiety status in the elderly population of India.

Little research has been done on the relationship between malnutrition and mental health status in elderly individuals in Delhi. In the presence study, we aimed to assess the associations between nutritional profile, pain, anxiety and depression status in a sample of elderly men and women in New Delhi, an urban city of a developing country. This pilot study will give directions for future studies which will help in formulation and implementation of various health policies. Thus, help in improving the quality of life of the elderly population in developing country like India.

METHODS

Data for the pilot study was collected in the geriatric urban population of Delhi, North India from January 2017 to September 2017 by students of post-graduation of diploma in health and social gerontology using nutritional, pain, depression and anxiety questionnaires. Respondents having age more than 60 years were considered for the study. Respondents suffering from chronic and serious illness were excluded from the study. Subjects were chosen by door-to-door visits after starting at a random household. The questionnaires were administered to the participants by the researchers after informed oral consent. Each respondent was subjected to a personal interview in the study. The same interview protocol was used among all respondents to maintain homogeneity in data collection. Questions regarding age, gender, weight, height, and general health statuses such as diagnosis of diabetes and hypertensions were also included. Responses were accepted from close family members of the same household if the member could not respond accurately as a result of cognitive impairment.

Nutritional profiling was conducted through predesigned Mini Nutritional Assessment (MNA), a questionnaire was specifically formulated for elderly people.[28] They comprised of 18 items, which are based on the following components: dietary questionnaire, global assessment of health and nutrition, anthropometric measurements, demographic details, information related to the presence of any health problems like hypertension, obesity, cardiac ailments, diabetes mellitus and social assessment. Interpretation of nutritional status was done based on the scores obtained through screening and assessment, which were as follows: Score <17 were taken as malnourished, Score 17–23.5 was considered at risk of malnutrition and score >23.5 were taken as well nourished.

Secondly, McGill Pain Questionnaire (MPQ) was used which is a well-known tool for the complete evaluation of pain in term of its intensity, location and sensitivity.[29] It also shows consistency with other pain intensity scales. A short version of the MPQ is made to ease the process for evaluation of pain in elderly who are not a good respondent. In short version of the MPQ, pain intensity is determined through 15-word descriptor list by using Verbal Descriptor Scale (VDS) and Visual Analog Scale (VAS Pain) method. However, the MPQ Short Form is easy and less time-taking. The short form has found its application in pain clinics for

older adults and is successfully applied over several years.

In the present study, McGill pain questionnaire which is based on four major domains such as sensory, affective, evaluative with miscellaneous was used with three major criteria including analysis of type/expression of pain, pain sensitivity, and pain intensity. The first criteria, i.e., type/experience of pain was analyzed based on 78 descriptor words divided into total 20 dimensions. Dimension 1 to 10 represents pain description, dimensions 11 to 15 represents affective components of pain, dimension 16 represents an evaluation of pain and dimension 17 to 20 includes miscellaneous. The second criteria were used to get the sensitivity of pain through 22 descriptors whereas the third criteria-which tell us about the intensity of pain was evaluated on 5 points scale. Each descriptor is given with a value based on its rank value in the word set. Scores are calculated by summing descriptors values and evaluated on a scale of 0 (no pain) to 78 (severe pain). Based on the score, we have divided the participants into three categories such as mild pain with a score up to 35, moderate pain with a score of 35 to 78, and severe pain with a score of >78.

The Hamilton depression Rating Scale (HAM-D) was used to analyze the level of depressive symptoms in elderly Delhi population. Members were selected based on similar criteria as done for above mention studies. HAM-D is the most accepted and widely used questionnaire for depressive symptoms analysis in clinical as well as in research studies. A set of questionnaire is made which is related to different aspects of depressive symptoms such as feelings of guilt, insomnia, suicide ideation, probing mood, anxiety, weight loss, and agitation in behavior. In the given study a set of 21 questionnaires were taken to evaluate the level of depressive symptoms in elderly population. Questions 1, 2, 3, 7, 8, 9, 10, 11, 15, 19 were rated on the scale of 0 to 4 and questions 4, 5, 6, 12, 13, 14, 17, 18, 21 were rated on the scale of 0 to 2 whereas, question 16 and 20 was rated on scale of 0 to 3. Zero score represents no symptom whereas 4 or 3 or 2 represent high level of observed symptoms. Based on the total score from all questions a depressive status was given to the participating member. A score of 0 is considered as normal level, upto 7 mild to moderate, 8 to 30 moderate to severe, and >30 as severe depressive symptoms.[30]

Level of anxiety was evaluated through the Hamilton Anxiety Rating Scale (HAM-A).[31] Similar criteria were taken to select the participants as done for nutritional and pain studies. It was used to measure the severity of anxiety in both clinical and research study. It helps to analyze anxiety such as anxious mood, tension, fears, insomnia, intellectual level, depressed mood and somatic anxiety symptoms such as sensory, cardiovascular, respiratory, gastrointestinal, genitourinary, autonomic and observed behavior at interview. Fourteen items indicate the level of anxiety through series of symptom, depicted by each item. Each question is rated on a scale ranged from 0 (not present) to 4 (severe). A total score ranged from 0–56 is given to

all 14 items which indicate towards the level of anxiety. Mild severity is indicated by a score <17, mild to moderate severity with score ranged from 18–24 and moderate to severe with score range 25–30.

Analysis: A simple percentage based analysis was performed to estimate the prevalence of malnutrition, pain, depressive symptoms, and anxiety through Bar chart in the elderly population of Delhi. Data were analyzed using SPSS- version 21 IBM software for analysis. Co-relation between different parameters was observed through Spearman's rho correction due to categorical value. Pearson chi-square was performed to analyze the effect of gender on different categories of four evaluation parameters. Independent t-test was performed to analyze the relation between male and female respondents in different parameters. Linear regression analysis was also done to confirm the independent associations between malnutrition and other parameters. Significance was evaluated at p ≤0.05 level.

RESULTS

Nutritional Status in Elderly Population through MNA Tool

The study comprised a total of 123 participants belonging to age groups >60 years. Both male and female candidates participated in the study. MNA showed that out of the total 123 participants, 45 (37%) were having MNA score <17 and were considered as malnourished, 48 (39%) were having MNA score in the range of 17 to 23.5 and were taken as at risk of malnutrition. The rest 30 (24%) showed a high MNA score >23.5 and found to have normal nutritional status. Abnormal nutritional (malnourished+at the risk of malnutrition) status was observed to be 76% (37%+39%) in the elderly population.

Figure 1. Nutritional status in elderly population through MNA tool
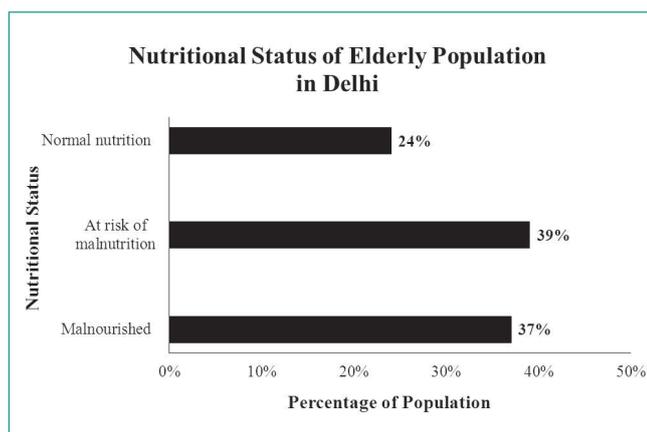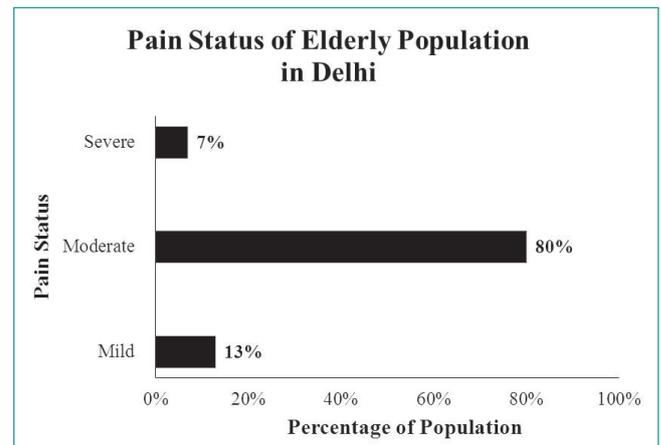

Pain Status in Elderly Population through MPQ Tool

Total 60 participants both male and female were taken in the study to analyze the pain status. Out of 60, 8 (13%) showed mild pain, 48 (80%) showed moderate, and 4 (7%) showed severe pain condition on MPQ scale in the elderly population of Delhi. Thus, painful conditions (moderate pain+severe pain) were observed in 87% (80%+7%) of the elderly population.
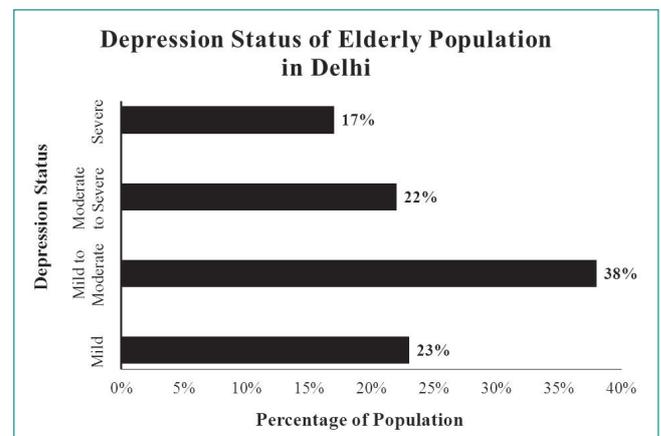
Figure 2. Pain status in elderly population through MPQ tool

Depression Status in Elderly Population through HDA

Total 60 participants both male and female were taken in the study to analyze the prevalence of depressive symptoms. Based on HAD, it was found that 14 (23%) participants show mild depressive symptoms 23 (38%) mild to moderate, 13 (22%) moderate to severe and 10 (17%) severe depressive symptoms. Thus, 77% (mild to moderate+moderate to severe+severe depressive symptoms) of Delhi elderly population has depressive symptoms.
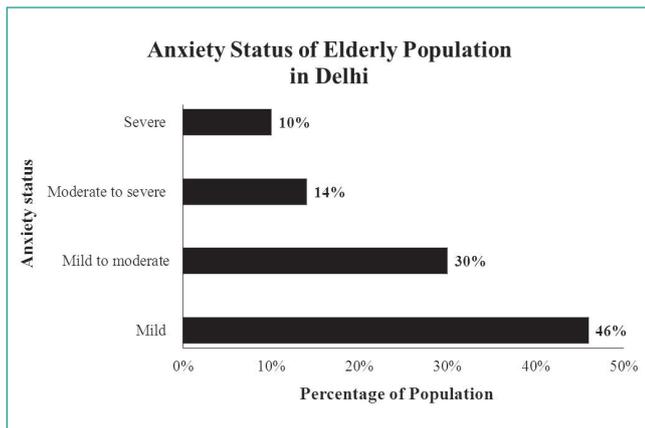
Figure 3. Depression status in elderly population through HDA

Anxiety Status in Elderly Population through HAR Tool

HAR was performed with total 101 participants from both male and female group. Anxiety status was analyzed, and it was observed that out of 101 participants, 47 (46%) showed mild anxiety, 30 (30%) showed mild to moderate anxiety, 14 (14%) showed moderate to severe anxiety and 10 (10%) severe anxiety conditions on HAR scale in elderly population of Delhi. Hence, 54% (mild to moderate anxiety+moderate to severe anxiety+severe anxiety) of the elderly population of Delhi was found to be anxious.

Gender distribution was taken as a demographic parameter in the study. The relationship between male and female was analyzed in four parameters through independents

Figure 4. Anxiety status in elderly population through HAR tool

and pain symptoms were insufficient to explain variability in nutritional scores of these participants.

DISCUSSION

A considerable portion of Indian population is constituted by geriatric population. It is estimated that by 2030, this figure may reach up to 12 %. The better healthcare and control of infectious diseases contribute to the significant increase in lifespan of the Indian population. This rapid rise in the elderly population increases the socio-economic challenges in Indian society. There is great concern about the health status of elderly regarding nutritional, physiological and other psychological parameters so that elderly will remain productive and independent as long as possible.[32] In the present study nutritional status as well as other psychological parameters were analyzed in the elderly urban population of Delhi. All these parameters studied may come under Geriatric Syndromes.

t-test. It was observed that nutrition had a significant relationship whereas other parameters were showing the non-significant relationship between male and female category (Table 1). Chi-square analysis suggested non-significant relation of gender with different categories of four evaluation parameters (p=0.05) (Table 2). However different parameters are found to be statistically co-relating to each other except anxiety and pain which showed no significant correlation between them (Table 3). The linear regression analysis was evaluated using nutritional status as a dependent variable. The explanatory value of these relationships was evaluated using R^2 value (49.5%). Results indicate a clear positive linear relationship between both malnutrition and anxiety (p=0.000). However, depressive

The MNA score showed that approximately 37% elderly were malnourished while 39% were at risk of malnutrition and only 24% were well nourished. Lei et al. (2009) observed that 19.6% of the elderly were malnourished (vs. 37% in the present study), with 53.2% at risk of malnutrition (vs. 39% in the present study), and 27.2% with a good nutritional status (vs. 24% in the present study) in the elderly population in Chinese Inpatients using MNA scale.[33] Whereas, the elderly urban population in Iran showed 10.0% malnourished, 42% at risk of malnutrition status and

Table 1. Demographic variable in the study of elderly population of Delhi

Parameters	Female, n (%)	Male, n (%)	p value*
Nutritional status (n=123)	59 (47.9)	64 (52.1)	0.050
Pain status (n=60)	24 (40)	36 (60)	0.406
Depression status (n=60)	30 (50)	30 (50)	0.313
Anxiety status (n=101)	42 (41.6)	59 (58.4)	0.301
*Independent (2-tailed) t-test, p <0.05 is considered as statistically significant.			

Table 2. Analysis of categories of different parameters with a demographic variable

Parameters	Categories	Female (%)	Male (%)	Total (%)	p value*
Nutritional	Normal nutrition	18.6	29.7	24.4	0.187
	At risk	37.3	40.6	39.0	
	Malnutrition	44.1	29.7	36.6	
Pain	Mild	12.5	13.9	13.3	0.798
	Moderate	83.3	77.8	80	
	Severe	4.2	8.3	6.7	
Depression	Mild	13.3	33.3	23.3	0.122
	Mild to moderate	50.0	26.7	38.3	
	Moderate to severe	16.7	26.7	21.6	
	Severe	20.0	13.3	16.7	
Anxiety	Mild	47.6	45.8	46.5	0.396
	Mild to moderate	33.3	27.1	29.7	
	Moderate to severe	7.1	18.6	13.9	
	Severe	11.9	8.5	9.9	
*Pearson Chi-Square, p <0.05 is considered as statistically significant.					

Table 3. Co-relation of nutrition, pain, depression, and anxiety in the elderly population of Delhi

Co-relation of Nutrition with Pain, Depression, and Anxiety		
	Correlation Coefficient	*p value
Pain	0.294	0.023
Depression	0.608	0.000
Anxiety	0.703	0.000
Co-relation of Pain with Nutrition, Depression, and Anxiety		
	Correlation Coefficient	*p value
Nutrition	0.294	0.023
Depression	0.285	0.028
Anxiety	0.153	0.244[NS]
Co-relation of Depression with Nutrition, Pain, and Anxiety		
	Correlation Coefficient	*p value
Nutrition	0.608	0.000
Pain	0.285	0.028
Anxiety	0.349	0.006
Co-relation of Anxiety with Nutrition, Pain, and Depression		
	Correlation Coefficient	*p value
Nutrition	0.703	0.000
Pain	0.153	0.244[NS]
Depression	0.349	0.006

*Co-relation with Spearman's rho correction, p <0.05 is considered as statistically significant; NS=not significant.

48.7% well-nourished status.[34] A study in the urban area of India (Allahabad) showed 24% malnourished, 37% at risk of malnutrition and 38% with good nutritional status.[35] Elderly living in rural areas has different nutritional status as compared to elder living in urban areas. For example, a study conducted in both urban and rural India showed that urban elderly are more nourished as compared to the rural elder. Malnutrition and risk of malnutrition were more common in rural (25%, 56%) than urban (11%, 40%), respectively. Surprisingly, the present study showed a similar trend in nutritional status in urban population, as found in the rural population of India. Various studies performed on rural elderly population also showed a similar trend as observed in the present study.[36-40] This might be due to the fact that the elderly population under study might have same economical and physiological status as that of the rural elderly population (due to urban migration). The variation in prevalence may reflect the use of different criteria both to define malnutrition and differences in sample selections. However, male and female nutritional status showed co-relation when observed through a t-test. Factors responsible for the malnutrition in elder population includes loss of appetite, change in taste, smell and decrease in uptake of nutritious food of nutrients, impaired oral and physical health (physical immobility, difficulty in chewing and swallowing of food), and occurrence of chronic diseases. Nutritional status also affects various psychological parameters in elderly. It was observed that malnourished people showed more sign of pain, depression and anxiety as compare to well nourish.[4,14,15] The present study showed 87% moderate to severe pain, 77% moderate to severe

depressive symptoms and 54% moderate to severe anxiety symptoms in the elderly urban population of Delhi. Silva et al. (2013) reported that cancer patients with less diet have more weight loss and pain condition as compare to patients with having a proper diet.[14] Similarly, Takahashi et al. (2014) observed that cancer patients which are malnourished showed more sign of pain as compare to patients which are having their diet properly.[41] Here, we are also reporting that elders with malnutrition and at the risk of malnutrition are more prone to moderate to severe pain condition even in the absence of any chronic diseases. Thirdly, elderly at malnutrition (37%) and at the risk of malnutrition (39%) was reported to have high depressive symptoms (77%). Elderly with low in nutrients requirement showed more depressed condition.[10,42-45] Lastly, anxiety (54%) level was observed to have a positive relation with nutritional status (76%), pain (87%) and depressive symptoms (77%). Various studies showed that nutritional status can be positively linked to the level of pain, depression and anxiety in elder population.[45-47] The low nutrients in the body will produce various physiological impairments such as immobility, muscle pain due to weakness, speaking and hearing problems, and etc. All these factors increase the level or intensity of pain, depressive symptoms and anxiety in elderly as observed in our study.[48-50] In our study, linear regression analysis indicates a clear positive linear relationship between both malnutrition and anxiety. Whereas there was no significant co-relation between pain and anxiety was observed which may be due to small sample size in these categories.

Thus, the present study shows that malnutrition in elderly population is associated with pain, anxiety and depressive symptoms. However, association of pain to anxiety status was found to be not significant.

CONCLUSION

The results of the present study revealed a high prevalence of malnutrition, pain, depressive symptoms, and anxiety among the elderly urban Delhi population. This highlights the deteriorating health condition of Delhi geriatric population. Delhi urban elderly population showed nutritional status similar to found in the rural population. So, health policy makers should consider this issue while formulating the health polices for Delhi geriatric population. Moreover, malnutrition was associated with worsening of physical and mental health status in term of pain, depression and anxiety level. Thus, mental health status should be considered along with their nutritional status in geriatric population for better health care and social support. Nutrition and counseling services should be provided to the elderly urban population for a healthy life and well being by medical professionals, families, community, NGO's and Government organizations.

Acknowledgment

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