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Health care of aging India: Questionnaire based assessment of nutritional risk status in geriatric population

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ABSTRACT

Background: This study focuses on assessing the nutritional risk status of elderly patients and evaluation of the factors affecting their nutritional health so that long-term planning and efforts can be made to maintain and improve quality of life (QOL) for elderly individuals.

Method: A risk appraisal questionnaire consisting of 9 questions was structured based on the nutrition screening initiative checklist. It was administered to a random sample of elderly patients who came to seek dental treatment, aged 50-80years in Bangalore. A regressive analysis was done to assess the risk status, cause and gender related effect was also assessed.

Results: The assessed questionnaire revealed that 59.8% of the elderly stated that oral problems faced by them caused difficulty in consumption of nutritious food. Among the elderly that took part in the study, 9.2 % were at a high nutritional risk and women were at a greater risk as compared to men.

Conclusion: The present study acts as an adjunct to determine the cause as well as gender related nutritional risk status for elderly individuals.

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INTRODUCTION

India has been addressed as an aging nation with 7.7% of its population being more than 60 years old. There has been a sharp increase in the proportion of elderly population in India as a result of demographic transition.¹

The proportion of elderly Indian population rose from 5.63 per cent in 1961 to 6.58 per cent in 1991² and to 7.5 per cent in 2001 and it has been estimated that they would become 12% of total population by 2030³. This rising number of elderly individuals attributes to the decreased mortality and longer life span of the individuals. A high prevalence of malnutrition (15 - 60%) in older people who are hospitalised or living in nursing homes, or who are in home care programmes, has been reported worldwide^{4,5}

Nutrition is increasingly being recognized as an important determinant, which modulate the biological process of ageing. It affects the progressive changes in the body composition associated with ageing, such as loss of bone and lean body mass.

Inadequate nutrition rank as one of the major problem of old age. Various factors which may be responsible for the change in one's diet in old age include social isolation, living alone, limited income, lack of mobility, dental problem, diminished taste acuity, food faddism and presence of chronic diseases

The scientific progress has reached a level where nutritional interventions may play a part in the prevention of degenerative conditions of age, improvement of quality of life reduce the risk of malnutrition⁶. Evaluation of nutritional status is important for any nutrition or dietary modification.

Therefore, the purpose of this study was to explore the nutritional risk status of elderly patients, coupled with evaluation of the factors affecting their nutritional health with the help of nutrition screening initiative checklist, as described by the American Academy of Family Physicians, the American Dietetic Association, and the National Council on Aging.

METHODS

A self administered risk appraisal questionnaire was structured based on the nutrition screening initiative checklist as described by the American Academy of Family Physicians, the American Dietetic Association, and the National Council on Aging, Washington DC.

The 9 causes assessed for nutritional health of elderly adults were pre-existing health condition, consumption of fewer than two meals per day, eating few fruits, vegetables or milk products, consumption of alcohol, tooth or mouth problems causing difficulty to eat, economically affected, eat alone most of the time, lost or gained 10 kgs in last 6 months unwillingly and unable to shop/ cook and/or feed self (Figure 1).

The 9 questions considered for inclusion in the present study was based on the association found with the nutritional well-being of the elderly in several studied conducted before⁷⁻¹¹.

Interview protocol :

The 87 participants who took part in the study were selected when reported to the out-patient department in The Oxford Dental College, Bangalore.

Inclusion criteria :

1. Elderly population in the age group of 50-80 years of age who reported to the dental out-patient department in The Oxford Dental College, Bangalore.
2. Elderly population who gave their consent to take part in the study.

After obtaining a prior consent, the self administered questionnaire was given to them. Upon completion, the questionnaires were collected.

Statistical analysis :

The data obtained was tabulated in MS Excel 2007 sheet and analyzed using the statistical package SPSS version 19.0.

The first criterion for analysis was to determine the leading cause for the deteriorating nutritional health in the elderly population based on the responses obtained from the participants.

The second criterion was the respondents' perceived health, which was categorized as good health, moderate nutritional risk and high nutritional risk based on the total score obtained.

Both criterion measures were normally distributed, ordinary least squares was used for estimation purposes. Coefficients for individual Checklist items were converted to effect sizes

(unstandardized coefficient divided by the criterion measure standard deviation) to facilitate comparisons between the models.

A bivariate regressive analysis using the Pearson Chi-square test and Fisher's exact test was done to evaluate the cumulative effect of gender and the cause on the nutritional risk as a third criterion.

The Warning Signs of poor nutritional health are often overlooked. Use this Checklist to find out if you or someone you know is at nutritional risk.

DETERMINE YOUR NUTRITIONAL HEALTH

Read the statements below. Circle the number in the "yes" column for those that apply to you or someone you know. For each "yes" answer, score the number in the box. Total your nutritional score.

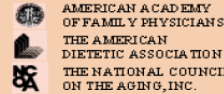
	YES
I have an illness or condition that made me change the kind and/or amount of food I eat.	2
I eat fewer than 2 meals per day.	3
I eat few fruits or vegetables or milk products.	2
I have 3 or more drinks of beer, liquor or wine almost every day.	2
I have tooth or mouth problems that make it hard for me to eat.	2
I don't always have enough money to buy the food I need.	4
I eat alone most of the time.	1
Without wanting to, I have lost or gained 10 pounds in the last 6 months.	2
I am not always physically able to shop, cook and/or feed myself.	2
TOTAL	

Total Your Nutritional Score. If it's –

- 0-2 Good! Recheck your nutritional score in 6 months.
- 3-5 You are at moderate nutritional risk. See what can be done to improve your eating habits and lifestyle. Your office on aging, senior nutrition program, senior citizens center or health department can help. Recheck your nutritional score in 3 months.
- 6 or more You are at high nutritional risk. Bring this Checklist the next time you see your doctor, dietitian or other qualified health or social service professional. Talk with them about any problems you may have. Ask for help to improve your nutritional health.

Remember that Warning Signs suggest risk, but do not represent a diagnosis of any condition. Turn the page to learn more about the Warnings Signs of poor nutritional health.

These materials are developed and distributed by the Nutrition Screening Initiative, a project of:



The Nutrition Screening Initiative • 1010 Wisconsin Avenue, NW • Suite 800 • Washington, DC 20007
 The Nutrition Screening Initiative is funded in part by a grant from Ross Products Division of Abbott Laboratories, Inc.

Figure- 1 The nutrition screening initiative checklist as described by the American Academy of Family Physicians, the American Dietetic Association, and the National Council on Aging, Washington DC.

RESULTS

GENDER	NUMBER	PERCENTAGE
MEN	47	54%
WOMEN	40	46%

Table- 1 Demographic characteristics of geriatric patients participated in the study based on gender

The overall cumulative effect of each cause was assessed and presented in Table 2. It was observed that a vast majority of 59.8% of the participants stated that they had tooth or mouth related problems, which made it difficult for them to eat. Implementing that, oral problem is one the major cause which leads to decrease in consumption of nutritional food.

Out of the 87 participants, 21.8% of them stated that they consumed fewer fruits, vegetables or milk products, 17.20% of participants stated that they eat alone most of the time and 9.2 % stated that they aren't always able to shop, cook and or feed themselves. This showed that loneliness and several psychological factors affect the elderly, which has a direct impact on their nutritional health.

Other health related causes were also stated by the participants. In which, 13.8 % stated that a pre existing illness or condition that made the change the kind/ amount of food they eat, and 12.60% stated that they had an unintentional change in their weight during the last 6 months. Thus, medical health of the elderly has also shown to be a factor affecting the nutritional health. Thus, in a varying proportion most of the causes enlisted in the questionnaire were seen to be affecting the nutritional health of the elderly.

A completed nutritional risk status assessment showed that, 9.2% of the elderly who took part in the study were in a high nutritional risk status, with a total score of more than 6. About, 26.4% had moderate nutritional risk with a total score ranging from 3-5. Making it a total of 35.6 % of the geriatric population who took part in the study showed a nutritional risk status as illustrated in table 3.

Further, in this study, gender based nutritional risk status was also assessed (Table 4). It was observed that 17.50% of the elderly women who took part in the study were in the high nutritional risk status, while 4.25% of the total elderly men who took part in the study were in high nutritional risk. Thus revealing that the elderly women are more nutritionally affected in comparison with men.

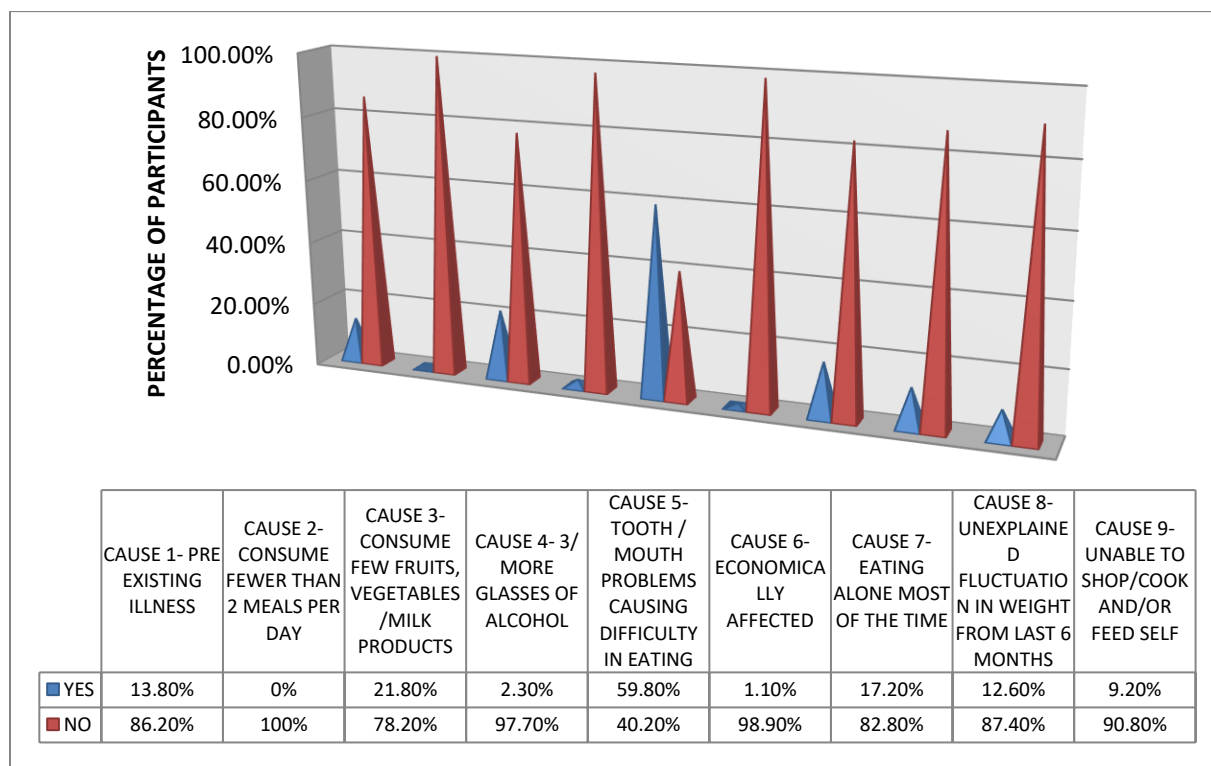


Table 2- Cause for deteriorating nutritional health status

NUTRITIONAL RISK STATUS	PERCENTAGE
HIGH NUTRITIONAL RISK	9.2%
MODERATE NUTRITIONAL RISK	26.4%
GOOD NUTRITIONAL HEALTH	64.4%

Table 3

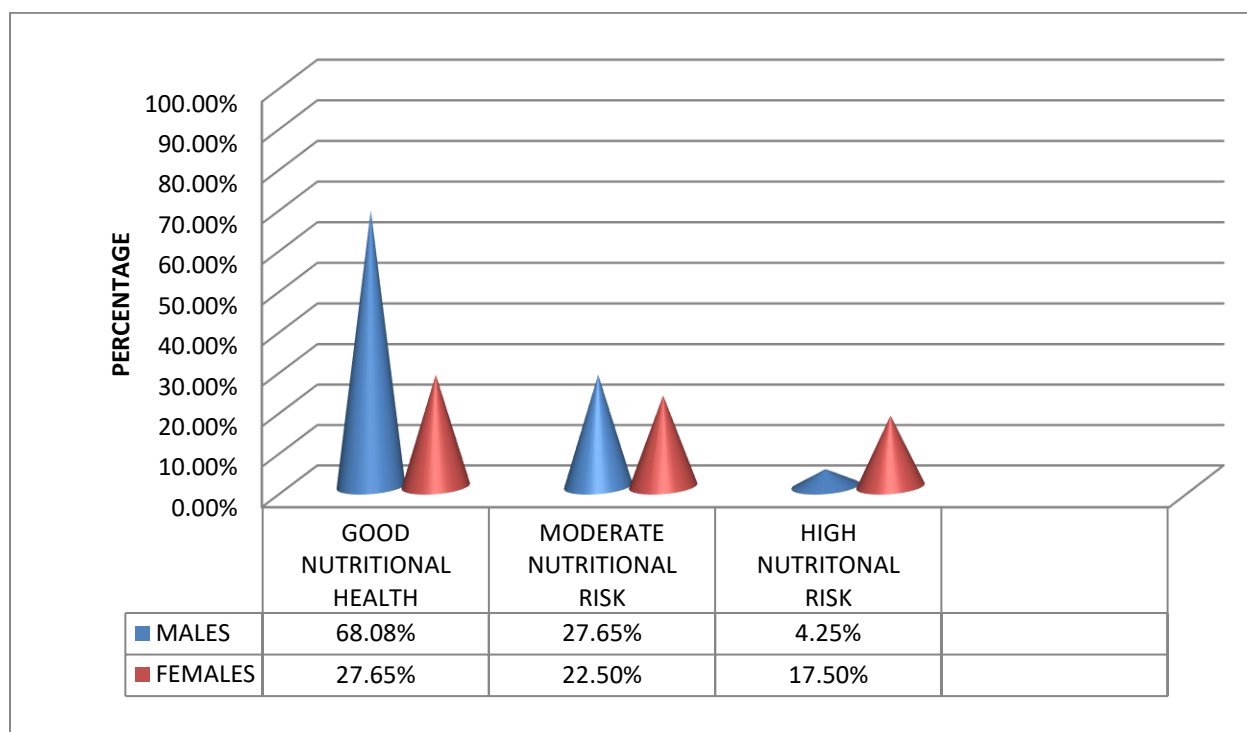


Table 4- Gender based nutritional risk assessment

A bivariate analysis for the cumulative effect of gender and the cause on the nutritional risk status is presented in Table 5 showing no statistical significance of the aforementioned parameters with the nutritional risk status (P values >0.05). However the gender based effect of tooth or mouth related problems on the nutritional risk status of the elderly was statistically significant (P value < 0.05).

Probability prediction after regression indicated that the overall probability of occurrence of high nutritional risk in elderly women 17.50% was higher than elderly men. Finally, the most probable cause for high nutritional risk among the elderly being tooth, mouth related problems and eating fewer fruits, vegetable and milk products was 59.77% and 21.83% respectively.

VARIABLE	Yes (n)	Yes (%)	No (n)	No (%)	p- value	Pearson X ² value
Question 1 pre-existing health condition						
Male	5	10.63%	42	89.36%	0.372	0.856 ^a
Female	7	17.5%	33	82.5%		
Total	12	13.79%	75	86.2%		
Question 2 consumption of fewer than two meals per day						
Male	0	0	47	100%		.a
Female	0	0	40	100%		
Total	0	0	87	100%		
Question 3 eating few fruits, vegetables or milk products						
Male	7	14.89%	40	85.1%	0.120	2.889 ^a
Female	12	30%	28	70%		
Total	19	21.83%	68	78.16%		
Question 4 consumption of alcohol						
Male	2	4.25%	45	95.7%	0.497	1.742 ^a
Female	0	0	40	100%		
Total	2	2.29%	85	97.7%		
Question 5 tooth or mouth problems, causing difficulty to eat						
Male	23	48.93%	24	51.06%	0.030*	4.990 ^{a*}
Female	29	72.5%	11	27.5%		
Total	52	59.77%	35	40.22%		
Question 6 economically affected						
Male	0	0	47	100%	0.460	1.189 ^a
Female	1	2.5%	39	97.5%		
Total	1	1.12%	86	98.85%		
Question 7 eat alone most of the time						
Male	10	21.27%	37	78.72%	0.395	1.167 ^a
Female	5	12.5%	35	87.5%		
Total	15	17.2%	72	82.75%		

Question 8 lost or gained 10 kgs in last 6 months unwillingly						
Male	5	10.63%	42	89.36%	0.748	0.372 ^a
Female	6	15%	34	85%		
Total	11	12.64%	76	87.35%		
Question 9 unable to shop/ cook and/or feed self						
Male	3	6.38%	44	93.6%	0.462	0.968 ^a
Female	5	12.50%	35	87.5%		
Total	8	9.19%	79	90.8%		

[*Statistically significant difference between the groups]

Table 5- The effect of gender on the assessment of the cause for nutritional risk

DISCUSSION

Four factors that commonly influence the dietary selection and the nutritional status of elderly individuals are: general health, socioeconomic status, dietary habits, and oral health status (including masticatory function). These factors are mutually related, which means that the cause of a nutritional deficiency is normally multifactorial.¹²

Proper nutritional assessment and suitable dietary advice is often more appropriate in coping with malnutrition than merely instituting prosthodontic therapy.¹³

In the present study, a large population of geriatric patients (59.80%) stated that the tooth and the oral problems faced by them causing low masticatory function as a major reason for the difficulty faced in eating nutritious food.

Numerous studies have provided strong evidence of an association between diminished masticatory function and the amount of fruits, vegetables, meats and breads that individuals consume. Wayler and Chauncey¹⁴ examined a sample of 814 subjects. After comparing the frequency of ingestion of hard and soft foods, along with their ratings of chewing difficulty, the researchers concluded that “shift in food selection patterns result from impairments in masticatory ability and appear to depend on the degree of impairment.” Brodeur and others¹⁵ noted a significantly higher intake of fruits and vegetables (by 13%) in subjects with high masticatory ability than in a group with low masticatory ability, whereas Johansson and others¹⁶ witnessed a noteworthy lack of intake of fruits, vegetables and fiber in a group of edentulous men.

In the present study, 17.20 % of the individuals stated that they eat alone most of the time. Every individual experiences a change in their diet during the course of life. Furthermore, the ability to eat healthily is influenced by a person’s social environment – including factors such as marriage,

cohabitation, friendship and general social interaction. As people age, they are less likely to eat well – and when older people are living alone their diet often suffers. As expected, the associations between eating alone and the risks for obesity and poor dietary behavior in men were more prominent among those living alone.

Redondo et al.¹⁷ investigated the associations of eating alone with meal skipping and low frequency of vegetable and fruit intake as dietary behaviors. They did so because meal skipping has been found to be associated with an array of unhealthful outcomes, including lower nutrient intake. Thus, eating alone lead to a variety of nutritional risks in the elderly.

The psychological status of the elderly, along with their loneliness has shown to affect their eating habits, leading to consumption of less nutritious food and fewer than two meals per day. In the present study, 21.80% participants stated that they eat fewer fruits, vegetables or milk products, and about 9.20% of the individuals stated that they are either unable to shop, cook and/or feed themselves.

Sominsky&Spencer¹⁸,in their study stated that women who live with others may be more likely to feel socially isolated when eating alone, and this psychosocial strain may promote skipping meals and/or reduce the frequency of vegetable and fruit intake which lead to nutritional risk in them.

Conklin et al¹⁹stated that, men who lived alone showed deteriorating nutritional status, due to poor dietary behaviors, such as skipping meals and low vegetable and fruit intake.The lack of cooking skills may also prompt men to consume convenient, nonnutritive food.^{20,21,22}

Several medical, psychological and social factors have shown to be associated with higher rates of malnutrition in older people.²³One of the most common presentations is loss of appetite and weight loss. It hasbeen documented that 30% to 36% of weight loss seen in outpatients and the nursing home is due to depression.²⁴

In the present study 13.80 % of individuals stated that they have apre-existing health condition that is affecting their eating ability. Moreover, 12.60% of individuals stated that they observed unexplained variation in their weight during the last 6 months. This clearly states that, the elderly face a variety of medical, psychological and social factors, which directly affect their nutritional status as the requirement of the various micro and macro nutrients remains the same irrespective of the age.

Furthermore, in the present study gender based differences in patterns of nutritional risk status was observed. Kusumaratmaet al²⁵ reported in their study that female participants had a lower intake of energy and nutrients than male participants, however both the genders had inadequate micronutrient intake. This was in accordance with a study conducted by Ali et al²⁶ which showed that lower scores of mini nutritional assessment was seen in relation to female gender.

In our study, 17.50 % of the total elderly women who participated in the study showed a high nutritional risk status while 4.25 % of the elderly men were under high nutritional risk status.Thus showing that, the female gender is more affected than male gender and is at a greater nutritional risk comparatively.

CONCLUSION

This study has provided valuable insights into everyday food practices in later life, and in general has emphasised the substantial influence of several medical, oral and psychological factors. It has highlighted age-related changes in the nutritional health status. It has even laid emphasis on gender related nutritional risk status.

Furthermore, initiatives need to be taken to address direct issues of food access as well as contributory elements such as oral health, loneliness, social isolation, underlying systemic health within the older population.

REFERENCES

1. Irudaya RS. Demography of ageing. In: Dey AB, editor. Ageing in India, Situational analysis and planning for the future. New Delhi: Rakmo Press; 2003.
2. Mishra US, Irudaya RS, and Sarma PS. eds. India's Elderly: Burden Or Challenge? New Delhi: Sage Publications and London: Thousand Oaks, 1999.
3. Irudaya RS, Sarma PS, Mishra US. Foundation of Aging In India In: Liebig P, Irudaya R.S., eds. An Aging India: perspectives, prospects and policies, Haworth Press; 2003
4. Vellas B, Guigoz Y, Garry P, et al. The Mini Nutritional Assessment (MNA) and its use in grading the nutritional state of elderly patients. *Nutrition* 1999; 15(2): 116-122.
5. Gupta KL, Dworkin B, Gambert SR. Common nutritional disorders in the older people: Atypical manifestations. *Geriatrics* 1998; 43(2): 87-97
6. Guigoz Y. The Mini Nutritional Assessment (MNA) review of the literature--What does it tell us? *Journal Nutr Health Aging* 2006; 10 (6):466-85.
7. Posner B M, Jette A M, Smith K W, Miller D R. Nutrition and Health Risks in the Elderly: The Nutrition Screening Initiative. *American journal of public health* 1993 Jul;83 (7):972-978.
8. Dwyer JT. Screening Older Americans' Nutritional Health Current Practices and Future Possibilities. Washington, DC: Nutrition Screening Initiative; 1991.
9. Morley JE. Nutritional status of the elderly. *Am J Med J* 1986;81:679-695.
10. Posner BM. Nutrition and the Elderly. Lexington, Mass: D.C. Heath & Co; 1979.
11. Roe DA. Geriatric Nutrition. Englewood Cliffs, NJ: Prentice-Hall Inc; 1983.
12. Makwana B R, Agarwal V, Makwana R . Comparative evaluation of nutritional status of elderly dentulous and completely edentulous patients wearing complete dentures, *Indian journal of community health*; 2014 Dec; 26(02)
13. Goel k, Singh s v ,chand p, rao j, tripathi s ,kumar l et al. impact of different prosthodontic treatment modalities on nutritional parameters of elderly patients. *J Prosthodont* 2016 Jan, 25(1):21-27

14. Wayler AH, Chauncey HH. Impact of complete dentures and impaired natural dentition on masticatory performance and food choice in healthy aging men. *J Prosthet Dent* 1983; 49(3):427-33
15. Brodeur JM, Laurin D, Vallee R, Lachapelle D. Nutrient intake and gastrointestinal disorders related to masticatory performance in the edentulous elderly. *J Prosthet Dent* 1993; 70(5):468-73.
16. Johansson I, Tidehag P, Lundberg V, Hallmans G. Dental status, diet and cardiovascular risk factors in middle-aged people in northern Sweden. *Community Dent Oral Epidemiol* 1994; 22(6):431-6.
17. Redondo, M. R., Ortega, R. M., Zamora, M. J., Quintas, M. E., Lopez-Sobaler, A. M., Andres, P., et al. (1997). Influence of the number of meals taken per day on cardiovascular risk factors and the energy and nutrient intakes of a group of elderly people. *International Journal for Vitamin and Nutrition Research*, 67(3),176e182.
18. Sominsky, L., & Spencer, S. J. (2014). Eating behavior and stress: a pathway to obesity. *Frontiers in Psychology*, 5, 434
19. Conklin, A. I., Forouhi, N. G., Surtees, P., Khaw, K. T., Wareham, N. J., & Monsivais, P. (2014). Social relationships and healthful dietary behaviour: evidence from over-50s in the EPIC cohort, UK. *Social Science & Medicine*, 100, 167e175
20. Betts, N. M. (1985). A method to measure perceptions of food among the elderly. *Journal of Nutrition for the Elderly*, 4(4), 15e21
21. Baker, A. H., & Wardle, J. (2003). Sex differences in fruit and vegetable intake in older adults. *Appetite*, 40(3), 269e275
22. Kronld, M., Lau, D., Yurkiw, M. A., & Coleman, P. H. (1982). Food use and perceived food meanings of the elderly. *Journal of the American Dietetic Association*, 80(6),523e529.
23. Steele J. National Diet and Nutrition Survey: people aged 65 years and over, Vol 2. Report of the oral health survey. London. The Stationary Office; 1998
24. Morely JE, Kraenzle D. Causes of weight loss in a community nursing home. *J Am Geriatr Soc*. 1994;42:583–585.
25. Kusumaratna R K. Gender differences in nutritional intake and status in healthy free-living elderly. *Universamedicina*, 2008 Jul-Sept; 27(3):113-124.
26. Ali M H, Karim M, Lahhiry S, Faruquee M H, Yasmin N, Chaklader M A. Gender differences in nutritional status of elderly people in selected rural areas of Bangladesh, *Bangladesh journal of medical science* 2013 Apr; 12(02) : 150-157.