

# **ABSTRACT**

## **Introduction**

Undernutrition is a global and local challenge as a major contributor to morbidity and mortality among the elderly. Health and economic burden due to undernutrition are public health concerns. Dietary pattern plays an important role as a modifiable factor associated with undernutrition among the elderly. The cut-off age for the elderly was taken as 60 years.

## **Objectives**

To describe the status of undernutrition, dietary pattern, associated factors and to evaluate the effectiveness of a nutrition education intervention in improving dietary pattern among the elderly in Colombo District.

## **Methods**

A descriptive cross sectional study was conducted among 800 elderly aged 60 years or above in Colombo District, recruited through multistage cluster sampling, using probability proportionate to size technique to select 40 clusters. A pre-tested interviewer administered questionnaire, 24-hour dietary recall, anthropometric measurements and body composition measurements were used to collect data.

Undernutrition of the elderly was assessed using both anthropometric measurements and body composition measurements.

Dietary pattern was assessed using three dietary indicators namely, Dietary Diversity Score, Food Variety Score and Dietary Serving Score.

Defined composite criteria was used to categorize elderly as having undernutrition or inadequate dietary pattern.

The community based nutritional education intervention was designed as three learning modules to fulfill three objectives and the activities were planned under these objectives. The intervention was delivered as two sessions through locally available resource persons.

A quasi-experimental study was conducted among 120 elders, 60 each in two Divisional Secretariat divisions in Colombo District who were identified as undernourished from the

descriptive study, to assess the effectiveness of the intervention. The primary outcome was the improvement of the dietary diversity score. Evaluation of the intervention was done as process evaluation and outcome evaluation. The outcome evaluation was conducted two weeks after the implementation of the intervention to assess the effectiveness and after three months, to assess the sustainability of the intervention.

Data analysis was conducted using SPSS version 22. The factors with significant association with undernutrition/ dietary pattern were identified by the chi-square test and the probability level of 0.05 was taken as the significant level. Bivariate analysis followed by logistic regression was conducted to find significantly associated factors of undernutrition and dietary pattern after adjusting for confounders.

The mean values of Dietary Diversity Score, Food Variety Score and Dietary Serving Score, between the intervention and control group were compared, two weeks and three months after the implementation of the intervention, using the independent sample t test.

## **Results**

Among the sample of the elderly studied, 35.3% (n=282; 95% CI: 31.8%-38.7%) were undernourished.

After adjusting for confounders, the factors significantly associated with undernutrition among the elderly were, female sex (aOR=8.6; 95% CI=5.2 – 14.09), not having a monthly income (aOR=1.51; 95% CI=1.06-2.14) and little or no responsibility on food shopping (aOR=1.89; 95% CI=1.3-2.73).

The mean and standard deviation of the Dietary Diversity Score, Food variety score and Dietary Serving Score of the study sample were, 4.05 (SD= 0.93), 6.67 (SD= 1.77) and 9.5 (SD=2.36) respectively.

Of the sample of the elderly studied, 47.9 % (n=383; 95% CI= 44.6%-51.8%) were having inadequate dietary pattern.

After adjusting for confounders, the factors significantly associated with inadequate dietary pattern among elderly were, Christian, Muslim or Hindu in religion (aOR=1.92; 95% CI: 1.14-3.22), rural living environment (aOR=1.41; 95% CI:1.03-1.95), having asthma/COPD

(aOR=2.39; 95% CI: 1.16-4.94), not getting nutritional advises from the hospital (aOR=1.64; 95% CI: 1.18-2.28), not getting nutritional advises from the GP (aOR=1.82; 95% CI: 1.12-2.96) and not having a home garden (aOR=1.41; 95% CI: 1.02-1.96).

In the quasi-experimental study, it was found that the intervention and control groups were comparable at baseline based on selected socio-demographic criteria and dietary indicators of the study units.

At the assessment of effectiveness of the intervention after two weeks of the implementation, the difference in dietary diversity scores between the intervention and control group was statistically significant ( $p=0.002$ ). At the assessment of sustainability of the intervention after three months of the implementation, the difference in dietary scores between the intervention and control group were statistically not significant ( $p>0.05$ ).

### **Conclusions and Recommendations**

As the burden of undernutrition and inadequacy of the dietary pattern among the elderly is considerable, relevant stakeholders and the general public should be made aware the consequences of this in order to formulate preventive strategies. It is necessary to implement screening programmes to detect under nutrition and nutrition education programmes for the elderly at community level. It is recommending to have a composite criterion to measure undernutrition among elderly especially in community setting as there is no accepted criterion at the moment.

**Keywords: Under nutrition, Dietary Pattern, Dietary Diversity Score, Food variety score, Dietary Serving Score, Nutrition education intervention**