# A study to assess nutrition and its relationship with depression among elderly people in selected rural community, Chengalpattu district, Tamil Nadu, India

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*Abstract*—To assess nutrition and depression among elders, to find out association between nutrition and depression of elders with their demographic variables and to find out the relationship between nutrition and depression of elders. A Descriptive research design adopted 100 elderly were selected using randomization sampling technique. Mini Nutritional Assessment and Geriatric Depression Scale were used to assess nutrition and depression. The study shows that in nutrition the majority falls within 'nourished category' (38%), 27% are 'at risk of malnourished' and 35% are 'malnourished'. In depression assessment 45% of elderly falls in 'mild depression category', 25% have 'no depression category', 21% have 'moderate depression' and 9% have 'severe depression'. The result shows a significant negative correlation between nutrition and depression among elderly ('r' value=-0.40). A significant association between nutrition and demographic variables such as height, mid arm circumference, religion, educational status, type of family, family income, marital status and availability of support system whereas significant association between depression and demographic variables are age, specific illness, BMI, height, weight, mid arm circumference, gender, religion, occupational status, type of family, family income, marital status and availability of support system. Proper nutrition plays a crucial role in managing and preventing depression in elderly people. A balanced diet rich in essential nutrients, such as omega-3 fatty acids, vitamins, and minerals, supports brain health and overall well-being. Addressing nutritional deficiencies, promoting healthy eating habits, and integrating dietary support into mental health care can significantly enhance the quality of life and emotional resilience in older adults.

*Index Terms*—**Nutrition, Depression and Elderly**

## I. INTRODUCTION

There is some evidence indicating that nutritional status of elderly has a significant impact on their physical health, but its relationship with their mood, especially depression, requires careful and systemic consideration (Narges Arsalaniet al, 2017). Aging, as a main period of life, is faced with many physiological and psychological Problems such as malnutrition and depression. Some evidences manifested that malnutrition and depression could affect each other. (Laleh Payahoo et al, 2013). Nutrition and depression among elderly have emerged as a major public-health problem, and depression is one of the leading causes of disease burden worldwide. The evidence shows that more than 50% of the elderly population is underweight and more than 90% has an energy intake below the recommended intake (Vamsi Krishna et al 2018). Depression is not a simple "being sad" or bored, but rather a pathology that needs intervention, treatment, and monitoring by professionals with expertise in mental health. It is a disorder that impacts the lives of people who do not receive timely help affecting not only the individual himself in his feelings, thoughts, and behaviors but also harming his relationships and daily life and is prevalent among elderly people (Teresa Catarina et al 2023). Aging induces physiological changes and affects all of organs. Nutritional status and mental health deteriorate with aging. As malnutrition and depression are main problem in elderly this study was performed to assess

the association between malnutrition and depression among rural elderly (Zamane Vafaei et al 2013).

## II. METHODS AND MATERIALS

Descriptive research design with a quantitative research approach used for this study to assess nutrition and its relationship with depression among elderly people in the Chengalpattu District, Tamil Nadu.

The study population consisted of elders aged above 65 years. Participants who were eligible for the study were recruited using systemic randomization sampling from public places. The participants were informed about the purpose of the study, and their voluntary participation was obtained. The sample size was calculated using the formula:

$S = Z^2 \times p(1-p)/M^2$

Z= 1.96 at 95% confidence level.

P= percentage of the population affected.

M= Marginal error.

The study got a approval from the Institutional Human Ethics Committee for Student Researchers (Ref No.: IHEC-I/2768/24). Permission was obtained from the relevant institute before conducting community visits. Informed consent was obtained from all participants, and confidentiality of data was maintained. Mini Nutritional Assessment and Geriatric Depression Scale were used to assess nutrition and depression.

Data Analysis

The data was analyzed using the SPSS statistical software. Descriptive statistics, such as frequencies and percentages, were utilized for data presentation. A correlation analysis was performed to explore the relationship between nutrition and depression, while chi-square, frequency, percentage and standard deviation tests were used to assess association between nutrition and depression of elders with their demographic variables.

## III. RESULT

Table 1: The level of nutrition and depression among elderly

Our study shows that in nutrition the majority falls within 'nourished category' (38%), 27% are 'at risk of malnourished' and 35% are 'malnourished'. In depression assessment 45% of elderly falls in 'mild depression category', 25% have 'no depression category', 21% have 'moderate depression' and 9% have 'severe depression'.

| Level of nutrition and depression | Percentage |
|---|---|
| Level of nutrition | |
| Nourished | 38 |
| At risk of malnourished | 27 |
| Malnourished | 35 |
| Level of depression | |
| No depression | 25 |
| Mild depression | 45 |
| Moderate depression | 21 |
| Severe depression | 9 |

Table 2: Correlation between nutrition and depression among elderly

| Category | Mean | Standard deviation | r value |
|---|---|---|---|
| Nutrition | 24.50 | 4.746 | - 0.40 |
| Depression | 4.68 | 3.668 | |

The table shows the mean, standard deviation, and correlation coefficient for Nutrition and Depression. Nutrition had a mean score of 24.50 with a standard deviation of 4.746, and Depression had a mean of 4.68 with a standard deviation of 3.668. A moderate negative correlation (r = -0.40) was observed, indicating an moderate negative correlation between nutrition and depression.

Table 3: Association between nutrition and demographic variables among elderly

Malnutrition is more common in elderly individuals below 4 feet (P=0.045), with MAC <21 cm

(P=0.046), and those with no formal education (P=0.045). Higher malnutrition rates are seen in nuclear families (P=0.037) and low-income groups (P=0.020). Divorced and unmarried individuals are at greater risk (P=0.002), and lack of support increases malnutrition risk (P=0.030)

| Demographic variables | Nourished | At risk | Malnourished | DF | Chi square | P value |
|---|---|---|---|---|---|---|
| 1.AGE | | | | | | |
| 65 - 70 | 17 | 14 | 14 | | | 0.43 (NS) |
| 71-75 | 10 | 1 | 2 | 4 | 9.83 | |
| above 75 | 23 | 14 | 5 | | | |
| 2.Is there any specific illness | | | | | | |
| No | 26 | 18 | 9 | 2 | 1.845 | 0.398 (NS) |
| Yes, | 24 | 11 | 12 | | | |
| 3.BMI Kg/ m$^2$ | | | | | | |
| BMI less than 19 | 6 | 2 | 2 | | | |
| BMI 19-21 | 27 | 17 | 9 | | | |
| BMI 21 - 23 | 14 | 10 | 10 | | | |
| BMI greater than 23 | 3 | 0 | 0 | 6 | 5.751 | 0.452(NS) |
| 4.Height | | | | | | |
| Below 4 feet | 26 | 16 | 8 | | | 0.045 (S) |
| 4-5 feet | 24 | 13 | 13 | 2 | 1.581 | |
| Above 5 feet | 50 | 29 | 20 | | | |
| 5) Weight | | | | | | |
| 40-50kg | 20 | 15 | 6 | | | |
| 51-60kg | 27 | 14 | 15 | 4 | 5.854 | 0.210(NS) |
| Above60kg | 3 | 0 | 0 | | | |
| 6) MAC in cm | | | | | | |
| MAC less than 21 | 15 | 13 | 3 | | | |
| MAC 21-22 | 32 | 16 | 18 | | | |
| MAC greater than 22 | 3 | 0 | 0 | 4 | 8.479 | 0.046 (S) |
| 7) Gender | | | | | | |
| male | 23 | 13 | 13 | | | |
| female | 27 | 16 | 8 | 2 | 1.782 | 0.410(NS) |
| transgender | 50 | 29 | 21 | | | |
| 8.Religion | | | | | | |
| Hindu | 15 | 12 | 11 | | | |
| Christian | 6 | 2 | 2 | 4 | 0.684 | 0.45(NS) |
| Muslim | 29 | 15 | 8 | | | |
| specify | 0 | 0 | 0 | | | |
| 9.Educational status | | | | | | |
| No formal education | 17 | 13 | 3 | | | |
| primary education | 19 | 6 | 8 | | | |
| Secondary education | 11 | 3 | 5 | 4 | 0.684 | 0.045 (S) |
| higher secondary | 2 | 7 | 5 | | | |

| education | | | | | | |
|---|---|---|---|---|---|---|
| college and other | 1 | 0 | 0 | | | |
| 10)Occupational status | | | | | | |
| Unemployment | 17 | 13 | 13 | 10 | 13.492 | 0.197(NS) |
| home maker | 19 | 15 | 6 | | | |
| business | 7 | 1 | 2 | | | |
| government | 0 | 0 | 0 | | | |
| Private | 1 | 0 | 0 | | | |
| daily worker | 4 | 0 | 0 | | | |
| retired people | 2 | 0 | 0 | | | |
| 11.Type of family | | | | | | |
| nuclear family | 10 | 1 | 2 | | | |
| joint family | 31 | 26 | 16 | 6 | 13.06 | 0.037 (S) |
| extended family | 6 | 0 | 0 | | | |
| 12) Family income | | | | | | |
| below Rs. 10000 | 1 | 0 | 0 | | | |
| Rs. 10000 - 15000 | 4 | 0 | 0 | | | |
| Rs. 15001 - 20000 | 21 | 8 | 10 | | | |
| above Rs. 20000 | 24 | 21 | 11 | 6 | 8.50 | 0.020 (S) |
| 13)Marital status | | | | | | |
| Married | 28 | 8 | 10 | 4 | 16.440 | 0.002 (S) |
| Unmarried | 3 | 9 | 8 | | | |
| Divorced | 19 | 12 | 3 | | | |
| 14.Is there any known case of mental illness | | | | | | |
| a)Yes | 15 | 5 | 8 | 2 | 2.286 | 0.243(NS) |
| b)No | 35 | 24 | 13 | | | |
| 15)Availabiliy of support system | | | | | | |
| No | 34 | 17 | 8 | 4 | 10.700 | 0.030 (S) |
| family and relatives | 5 | 9 | 8 | | | |
| NGO | 11 | 3 | 5 | | | |
| others specify | 0 | 0 | 0 | | | |
| 16)Type of food pattern | | | | | | |
| Vegetarian | 11 | 5 | 5 | | | |
| Non vegetarian | 39 | 24 | 26 | 2 | 0.37 | 0.828(NS) |

Table 4: Association between depression and demographic variables among elderly

Older age (P=0.001), specific illnesses (P=0.041), low BMI (<19 kg/m², P=0.002), and MAC <21 cm (P=0.002) are linked to higher depression rates. Lower weight (P=0.020), shorter height (P=0.041), and lower income (<₹15,000, P=0.009) increase severe depression risk. Females experience more mild depression, while males report moderate levels (P=0.018); Muslims (P=0.004) and those with no formal education (P=0.002) have higher depression rates. Unemployment (P=0.01), nuclear families (P=0.02), unmarried/divorced status (P=0.01), and lack of support (P=0.01) are also linked to severe depression.

| DEMOGRAPHIC VARIABLES | NO DEPRESSION | MILD DEPRESSION | MODERATE DEPRESSION | SEVERE DEPRESSION | DF | CHI SQUARE | P VALUE |
|---|---|---|---|---|---|---|---|
| 1.Age | | | | | | | |
| 65 -70 | 6 | 9 | 23 | 7 | 6 | 22.000 | 0.001(S) |
| 71 - 75 | 5 | 3 | 2 | 3 | | | |
| Above 75 | 6 | 23 | 7 | 6 | | | |
| 2.Is There Any Specific Illness | | | | | | | |
| NO | 9 | 25 | 13 | 6 | 3 | 8.282 | 0.041 (S) |
| YES MEANS SPECIFY | 8 | 10 | 19 | 10 | | | |
| 3.BMI Kg/m$^2$ | | | | | | | |
| BMI less than 19 | 3 | 1 | 3 | 3 | 2 | 25.846 | 0.002 (S) |
| BMI 19 - 21 | 6 | 28 | 12 | 7 | | | |
| BMI 21- 23 | 7 | 6 | 17 | 4 | | | |
| BMI greater than 23 | 1 | 0 | 0 | 2 | | | |
| 4.Height | | | | | | | |
| Below 4 feet | 8 | 24 | 11 | 7 | 3 | 8.262 | 0.041(S) |
| 4 - 5 feet | 9 | 11 | 21 | 9 | | | |
| Above 5 feet | 0 | 0 | 0 | 0 | | | |
| 5.Weight(kg) | | | | | | | |
| 40 - 50 | 5 | 21 | 9 | 6 | 6 | 14.971 | 0.020(S) |
| 51 - 60 | 10 | 14 | 23 | 9 | | | |
| Above 60 | 2 | 0 | 0 | 1 | | | |
| 6.Mid- arm Circumference | | | | | | | |
| MAC less than 21 | 4 | 19 | 5 | 3 | 6 | 20.829 | 0.002 (S) |
| MAC 21 - 22 | 12 | 16 | 27 | 11 | | | |
| MAC greater than 22 | 1 | 0 | 0 | 2 | | | |
| 7.Gender | | | | | | | |
| male | 10 | 10 | 21 | 8 | 3 | 10.047 | 0.018 (S) |
| female | 7 | 25 | 11 | 8 | | | |
| transgender | 0 | 0 | 0 | 0 | | | |
| 8.Religion | | | | | | | |
| Hindu | 5 | 7 | 19 | 7 | 6 | 18.873 | 0.004 (S) |
| Christian | 3 | 1 | 3 | 3 | | | |
| Muslim | 9 | 27 | 10 | 6 | | | |
| Specify | 0 | 0 | 0 | 0 | | | |
| 9.Educational Status | | | | | | | |
| No formal education | 6 | 19 | 5 | 3 | 12 | 31.491 | 0.002 (S) |
| Primary education | 5 | 10 | 10 | 8 | | | |
| Secondary education | 4 | 5 | 6 | 4 | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Higher secondary | 2 | 1 | 11 | 0 | | | |
| College and other | 0 | 0 | 0 | 1 | | | |
| 10.Occupational Status | | | | | | | |
| Unemployment | 5 | 10 | 21 | 7 | 15 | 47.233 | 0.01 (S) |
| Home maker | 5 | 21 | 9 | 5 | | | |
| Business | 2 | 4 | 2 | 2 | | | |
| Government employee | 0 | 0 | 0 | 0 | | | |
| Private employee | 1 | 0 | 0 | 0 | | | |
| Daily worker | 4 | 0 | 0 | 0 | | | |
| Retired people | 0 | 0 | 0 | 2 | | | |
| 11.Type of family | | | | | | | |
| Nuclear family | 5 | 4 | 2 | 2 | 9 | 40.208 | 0.02 (S) |
| Joint family | 11 | 29 | 26 | 7 | | | |
| Extended family | 1 | 2 | 4 | 7 | | | |
| 12.Family income | | | | | | | |
| Below 10000 | 0 | 0 | 0 | 1 | 9 | 23.339 | 0.009(S) |
| 10000 - 15000 | 3 | 0 | 0 | 1 | | | |
| 15001 - 20000 | 9 | 10 | 13 | 7 | | | |
| Above 20000 | 5 | 25 | 19 | 7 | | | |
| 13.Marrital status | | | | | | | |
| Married | 11 | 11 | 13 | 11 | 6 | 33.754 | 0.01 (S) |
| Unmarried | 1 | 3 | 15 | 7 | | | |
| Divorced | 5 | 21 | 4 | 4 | | | |
| 14.Is there any know case for mental illness | | | | | | | |
| a)Yes | 4 | 7 | 10 | 7 | 3 | 3.416 | 0.332(S) |
| b)No | 13 | 28 | 22 | 9 | | | |
| 15.Avalability of support system | | | | | | | |
| No | 14 | 26 | 11 | 8 | 6 | 22.525 | 0.01 (S) |
| family and relatives | 0 | 3 | 15 | 4 | | | |
| NGO | 3 | 6 | 6 | 4 | | | |
| others specify | 0 | 0 | 0 | 0 | | | |
| 16.Type of food pattern | | | | | | | |
| Vegetarian | 5 | 5 | 7 | 4 | 3 | 1.845 | 0.605(NS) |
| Non vegetarian | 12 | 30 | 25 | 7 | | | |

## IV. DISCUSSION

This study intends to assess nutrition and its relationship with depression in elderly people in selected rural community. In order to achieve the objectives of the study quantitative descriptive research design was used. Data was collected from 100 elderly people (above 65 years) using MNA and GDS tool, data gathered was analyzed by using descriptive and inferential statistics.Our study shows that in nutrition the majority falls within 'nourished category' (38%), 27% are 'at risk of malnourished'

and 35% are 'malnourished'. In depression assessment 45% of elderly falls in 'mild depression category', 25% have 'no depression category', 21% have 'moderate depression' and 9% have 'severe depression'. The result shows a significant negative correlation between nutrition and depression among elderly ('r' value=-0.40).

The study finding is supported by the study nutrition status and its relationship with depression in elderly people by Narges Arsalani, Monir Nobahar, Naim Sadat Kia, Maryam Etemadi Koomesh. In this descriptive cross-sectional study, 260 elderly individuals from the city of Semnan (Iran) were enrolled in 2015, with considering the inclusion and exclusion criteria. The data collection tool was questionnaire scales that briefly assess the demographic and nutritional status with mini nutritional assessment (MNA) and depression with geriatric depression scale (GDS). Results: Results indicated that 5.8% (n=15) had malnutrition, 53.1% (n=138) were at the risk of malnutrition and the other 41.2% (n=107) were normal. Also 21.9% (n=57) were at severe depression (20-30), 34.2% (n=89) had mild depression (10-19) and the other seniors 43.8% (n=114) were not depressed (Narges Arsalani et al 2015).

To assess nutrition and depression among elderly Findings of the study shows that in nutrition the majority falls within 'nourished category' (38%), 27% are 'at risk of malnourished' and 35% are 'malnourished'. In depression assessment 45% of elderly falls in 'mild depression category', 25% have 'no depression category', 21% have 'moderate depression' and 9% have 'severe depression'.

The findings of the study is supported by nutrition and its relation with depression in free living elderly individuals by Laleh et al. This cross-sectional study was carried on 184 elderly people (male=97; female=87) with the age ≥ 60 years. All subjects were selected from daily care centers for elderly people in Tabriz city. Mini Nutritional Assessment (MNA) and Geriatric Depression Score (GDS) were used to evaluate the nutritional status and depression prevalence, respectively. Results: More than 50% of subjects had inappropriate nutrition status (6.2% undernourished and 46.7% at risk of malnutrition). Prevalence of malnutrition in females was 5-fold more than males. The results of GDS test revealed that about 14% of elderly people had serve depression and 28.3% had mild depression. (Laleh et al 2013)

To find out the relationship between nutrition and depression among elderly the findings of the study reveals that there is a significant negative correlation between nutrition and depression ('r' value=-0.40). The findings of the study is supported by the study Malnutrition and depression in institutionalized elderly by Christine et.al. Nutritional status was assessed with the Mini Nutritional Assessment (MNA). Depressive symptoms were rated with the Geriatric Depression Scale (GDS). Self-caring capacity was measured with the Barthel index (BI) and QoL was assessed with the short-form thirty-six-item (SF-36) questionnaire. Of the NHR, twenty-six (22·8 %) were malnourished according to the MNA and sixty-six (57·9 %) were at nutritional risk. Of the residents, seventy-five could be assessed with the GDS, whereof sixteen (21·3 %) had major and twenty-six (34·7 %) had minor depressive symptoms. GDS scores tended to be higher in patients with impaired nutritional status (S D 3·6) in well-nourished subjects and 6·9 (S D 3·2) in residents with malnutrition or at risk of malnutrition). The MNA correlated significantly with the GDS ($r - 0.313$; $P = 0.006$) (Christine et al 2009), A cross-sectional, community-based study was conducted from May 2016 to March 2017 with 1,027 elderly individuals (aged≥ 60 years) living in Sohag Govern-orate, Egypt. A questionnaire was designed and included inquiries on sociolect-demographic variables (age, gender, and residence) and the 15-item Geriatric Depression Scale (GDS-15) to determine the outcome variable, the presence of depression, among the studied elderly population.About two-thirds (62.7%) of participants suffered from depression. Regarding depression levels, 450 (43.8%) participants had mild depression with GDS-15 scores between 5 and 8, and 18.9% of participants had moderate depression, represented by GDS-15 scores between 9 and 11. No participants had severe depression. Applying logistic regression analysis, increased age, female gender, and living in rural areas were significantly linked to the occurrence of geriatric depression among participants (Sohag govern-orate by Hanan et al).

## V. LIMITATION

Data collection period was 1 week only and the study conducted at only selected community area.

## VI. CONCLUSION

The study shows that in nutrition the majority falls within 'nourished category' (38%), 27% are 'at risk of malnourished' and 35% are 'malnourished'. In depression assessment 45% of elderly falls in 'mild depression category', 25% have 'no depression category', 21% have 'moderate depression' and 9% have 'severe depression'. The result shows a significant negative correlation between nutrition and depression among elderly ('r' value=-0.40). A significant association between nutrition and demographic variables such as height, mid arm circumference, religion, educational status, type of family, family income, marital status and availability of support system whereas significant association between depression and demographic variables are age, specific illness, BMI, height, weight, mid arm circumference, gender, religion, occupational status, type of family, family income, marital status and availability of support system.

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