

Association of Geriatric Depression with Biosocial Factors and Malnutrition in Rural Areas of District Gautam Budh Nagar, Uttar Pradesh: A Community-Based Study

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ABSTRACT

Background: Aging mainly affects human appetite, food intake, and body weight. Physiological and psychopharmacological pathways demonstrate variations in hunger. Bodily signs characterize Elderly Depression, altered eating and sleeping patterns, cognitive impairments, and low mood. **Objectives:** To study the prevalence of Depression and Malnutrition in the geriatric population in the rural community and to examine the association between them among the study population.

Methods: A community-based cross-sectional study was conducted in the rural areas of district Gautam Budh Nagar among geriatric population using a pre-designed pretested semi-structured questionnaire.

Results: In the study, the prevalence of Depression among the study participants was found to be 155(41.2%) and malnutrition was found to be in 67 (17.8 %). Among bio social characters Age (p-value-0.000), gender (p-value-0.012), marital status (p-value-0.026), physical activity (p-value-0.004), and Malnutrition (p-value-0.000) found to be significantly associated with Depression among elderly. On multiple logistic regression, physical activity [aOR 23.6; 95% CI: 11.4-48.8] and Malnutrition or its risk [aOR 0.272; 95% CI: 0.130-0.569] were significantly associated with Geriatric Depression.

Conclusions: Depression is recognized to have a significant impact on nutritional health in the elderly and is a major factor in weight loss.

Keywords: Geriatric, Depression, Malnutrition, Rural

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INTRODUCTION

The biological process of aging, which continues throughout life, is something humans have no control over.¹ Losing interest in food, decrease in intake, and subsequently weight loss is brought about by Depression. The consideration of a change in appetite and eating habits as a sign and a major criterion for the diagnosis of Depression is made.^{2,3,4}

Geriatric Depression is a mental disorder that diminishes the quality of life and increases the propensity for suicide.⁵ Malnutrition is a chronic and often imperceptible process. Its identification is deemed essential for the reduction of adverse outcomes, which include increased dependency, compromised quality of living life, and elevated morbidity and mortality rates in the early stages, along with higher costs of medical care.⁶ The elderly population has a significantly higher occurrence even when average body mass index (BMI) is present. It is because of the changes in body composition as the Age progresses, characterized by a progressive increased fat and a declined lean body mass. Among the geriatric population, it is multifactorial. It is either a result of mental or physical factors or a combination of these or any combination thereof. Prevalence is higher in the dependent elderly suffering from impairment of functions. An essential and reversible cause of Malnutrition in older individuals is Depression.⁷

Mood states are related to carbohydrates. Carbohydrate-rich foods, which deliver glucose to cells, stimulate insulin release, increase metabolism, and initiate tryptophan release, are needed by the brain for neurotransmitter synthesis, thereby enhancing the mood of the individual who consumes them. On the other hand, a high risk for the development of Depression is associated with low-carbohydrate diets.⁸

Therefore, it has been confirmed by many studies that better psychological states and decreased rates of Depression are associated with increases in the quality of diet and healthy nutrition among the geriatric population. It has been observed in various settings, including homes, hospitals, and institutions, indicating that mental health is independently predicted by the nutritional state regardless of other confounding factors in old individuals.^{9,10,11,12}

Additionally, fewer studies have been done in rural areas. There are a number of risk factors, both at the individual and family levels, that warrant in-depth exploration. This study was conducted to find the prevalence of Depression and Malnutrition in the geriatric population in the rural community and to study the association between biosocial characteristics, Depression, and Malnutrition among the study population.

METHODOLOGY

Design and setting: This community-based cross-

sectional study was conducted after obtaining Ethical Clearance from the Institute Ethics Committee Reference No. (SU/SMS&R/76-A/2024/146) in the rural areas catered by the Rural Health and Training Centre (RHTC), located in the village Panchayatan of Tertiary Medical College in District Gautam Budh Nagar. The study was conducted from April 2024- July 2024.

Study population: Individuals aged 60 years and above were considered as the study population.

Inclusion criteria: Permanent residents of the selected rural area, aged 60 years and above, who were willing to give informed consent for participation, were included in the study.

Exclusion criteria: Those with debilitating illnesses, diagnosed with psychiatric illnesses, or already on treatment were excluded from the study.

Sample size and sampling technique:

The sample size was calculated by using the formula $n = Z^2PQ/L^2$. The values used were Z score = 1.96 (for 95% confidence level), P (prevalence) = 68%,¹³ Q (complement of prevalence) = 32%, and L (absolute error) = 5%. The sample size obtained was 334. A 10% non-response rate was considered; hence, the final sample size came out to be 376.

Data collection tool:

A pretested semi-structured Questionnaire was used to collect the data. The Questionnaire included questions regarding the socio-demographic details of the study participants. The Geriatric Depression Scale (GDS) was used as a screening tool to assess the depression levels among the study participants. It consists of 15 questions that require binary (yes/no) responses, and a score of 5 or above indicates the presence of Depression.¹⁴

The Mini Nutritional Assessment scale, a validated scale, was used to assess the nutritional status of the study participants. It consisted of six questions about their appetite, weight loss pattern, mobility, physical activity status, recent illness/stress, Dementia/ Depression, and Body Mass Index. A score of 0-7 was categorized 'malnourished,' 8 -11 points were categorized as 'At the risk of Malnutrition, and more than 11 points indicated Normal nutrition status.'^{15,16}

Height in cm, Midarm circumference in cm, calf circumference in cm, and weight were measured using standard measuring tools. Privacy was ensured during the interviews and examinations.

Data collection technique:

Out of the eight villages, four villages (Girdharpur, Chirsi, Ghanghola, Rauni) were selected using the convenience sampling method. The total geriatric population in the four villages was 1154. A list of all geriatric individuals was prepared. Then, using Systematic random sampling, every third geriatric individual was included in the study sample. A house-to-

house survey was conducted in these villages to interview the elderly population. In case more than one eligible study participant was present in one family, the elder one was included. Informed written consent was taken from participants before starting the study.

Variables studied:

Variables studied included socio-demographic information, comprising Age, gender, marital status, type of family, education, occupation, smoking, and alcohol intake. Information related to lifestyle characteristics, including psychosocial factors, physical health, and dietary factors, was also considered.

Statistical Analysis:

The data was entered and analysed using IBM SPSS Version 24. Descriptive statistics, such as frequency and percentages, were used. The Chi-square test was used to study the association for the Inferential statistics. The results were obtained at a confidence level of 95%, and it was considered statistically significant if the p-value was less than 0.05.

RESULTS

Biosocial characteristics of participants: Among the 376 study participants, 210 (55.9 %) belong to the age group of 60-69 years, whereas male participants were 172 (45.7 %) and female participants were 204 (54.3 %). Most of the participants were married, 293 (77.9%). The majority, 335 (89.1 %) of the participants, lived in Joint families. More than half were literate 239 (63.6 %) but unemployed 340 (90.4 %), and the majority belonged to Upper Middle-class socio-economic status (40.7 %) as per Modified BG Prasad Scale. About 218 (58.0 %) participants were non-smokers, 253 (67.3 %) were non-alcoholics, and about three-fourths (71%) were engaged in any sort of physical activity.

In the study, the prevalence of Depression among the study participants was found to be 155(41.2%). Out of the total participants, 67 (17.8 %) were malnourished. However, the majority of the participants, 227 (60.4 %) were at risk of developing Malnutrition. (Table 2)

Table 3 depicts the association between various biosocial factors and geriatric Depression. It shows that Age (p-value—0.000), gender (p-value—0.012), marital status (p-value—0.026), physical activity (p-value-0.004), and Malnutrition (p-value—0.000) have a significant association with the presence of Depression among the study participants. The prevalence of Depression was found to be higher among those living in nuclear families (53.7%) as compared to those living in joint families (39.7%), among smokers (44.9%), and among those who consumed alcohol (47.2%). However, the association was not found to be significant.

In our study, it was found that higher odds for Malnutrition were significantly associated with married status, living in the nuclear family, smoking, alcohol consumption, no physical activity, and the presence of Depression, as shown in **Table 4**

Applying multiple logistic regression and adjusting the potential confounders, it was found that physical activity [aOR 23.6; 95% CI: 11.4-48.8] and Malnutrition or risk of Malnutrition [aOR 0.272; 95% CI: 0.130-0.569] were significantly associated with Geriatric Depression. (**Table 5**)

Table 1: Distribution of Study participants according to Biosocial characters (N=376)

Biosocial Characteristics	Participants (%)
Age Group	
60-69	210 (55.9)
70-79	140 (37.2)
≥80	26(6.9)
Gender	
Male	194(51.6)
Female	182(48.4)
Marital Status	
Married	293(77.9)
Unmarried	83 (22.1)
Type of family	
Nuclear family	41(10.9)
Joint family	335(89.1)
Education	
Literate	239(63.6)
Illiterate	137(36.4)
Occupation	
Employed	36(9.6)
Unemployed	340(90.4)
Socio-economic Status	
Upper class	55 (14.6)
Upper Middle Class	153 (40.7)
Middle Class	137 (36.4)
Lower Middle Class	21 (5.6)
Lower Class	10 (2.6)
Smoking	
Yes	158(42.0)
No	218 (58.0)
Alcohol	
Yes	123 (32.7)
No	253 (67.3)
Physical Activity	
Yes	267 (71.0)
No	109(29.0)

Table 2: Distribution of study participants according to Nutritional status

Nutritional status	Participants (%)
Malnourished	67 (17.8)
At Risk of Malnutrition	227 (60.4)
Normal Nutrition status	82 (21.8)

Table 3: Association of biosocial characteristics and Depression among the study participants

Variables	Total	Depression Present (%)	Depression Absent (%)	p-value	OR (95% CI)
Age group					
60-69 years	236	121(51.3)	115(48.7)	0.000*	0.305 [.192-.484]
>=70 years	140	34(24.3)	106(75.7)		
Gender					
Male	194	92(59.4)	102(46.2)	0.012*	0.587 [.387-0.889]
Female	182	63(40.6)	119(53.8)		
Marital Status					
Married	293	112(38.2)	181(61.8)	0.026*	1.737 [1.063-2.838]
Single	83	43 (51.8)	40(48.2)		
Type of Family					
Joint	335	133 (39.7)	202(60.3)	0.087	1.759 [.917-3.374]
Nuclear	41	22 (53.7)	19 (46.3)		
Education					
Literate	239	90(37.7)	149(62.3)	0.064	1.495 [.977-2.287]
Illiterate	137	65 (47.4)	72 (52.6)		
Current Employment					
Employed	36	10(27.8)	26 (72.2)	.085	1.933 [.904-4.135]
Retired/ Unemployed	340	145 (42.6)	195(57.4)		
Socioeconomic class (modified BG PRASAD)					
Upper class	208	92 (44.2)	116 (55.8)	0.187	0.757 [0.499-1.146]
Lower Class	168	63 (37.5)	105 (62.5)		
Smoking					
Yes	158	71(44.9)	87 (55.1)	0.213	0.768 [0.507-1.164]
No	218	84(38.5)	134(61.5)		
Alcohol consumption					
Yes	123	58 (47.2)	65 (52.8)	0.103	0.697 [0.451-1.077]
No	253	97(38.3)	156(61.7)		
Physical activity					
Yes	267	57(21.3)	210(78.7)	0.000*	0.350 [0.133-0.920]
No	109	98 (89.9)	11(10.1)		
Malnutrition					
Yes**	285	140(49.1)	145(50.9)	0.000*	0.204 [.112-.373]
No	91	15 (16.5)	76(83.5)		

*p-value -Highly significant; **The present category includes malnourished and at risk of Malnutrition both

Table 4: Association of biosocial characteristics and Malnutrition among the study participants

Variables	Total	Malnutrition Present** (%)	Malnutrition Absent (%)	p-value	OR 95% CI
Age group					
60-69 years	236	179(75.8)	57(24.2)	0.977	1.007[.618-1.641]
>=70 years	140	106(75.7)	34(24.3)		
Gender					
Male	194	154(79.4)	40 (20.6)	0.094	1.499[0.932-2.410]
Female	182	131 (72.0)	51(28.0)		
Marital Status					
Married	293	214(73.0)	79(27.0)	0.019*	0.458[.236-0.889]
Unmarried	83	71 (85.5)	12(14.5)		
Type of Family					
Joint	335	247 (73.7)	88 (26.3)	0.006*	0.222[0.067-0.736]
Nuclear	41	38 (92.7)	3 (7.3)		
Education					
Literate	239	180(75.3)	59 (24.7)	0.772	0.930[.568-1.522]
Illiterate	137	105(76.6)	32 (23.4)		
Current Employment					
Employed	36	30(83.3)	6 (16.7)	0.267	1.667[.671-4.142]
Unemployed/Retired	340	255 (75.0)	85 (25.0)		
Socioeconomic class (modified BG PRASAD)					
Upper class	208	40 (19.2)	168 (80.8)	0.498	0.902[0.494-1.649]
Lower Class	168	27 (16.1)	141 (83.9)		
Smoking					
Yes	158	132(83.5)	26 (16.5)	0.003*	2.157[1.294-3.595]
No	218	153(70.2)	65 (29.8)		
Alcohol consumption					
Yes	123	107 (87.0)	16 (13.0)	0.000*	2.818[1.561-5.086]
No	253	178(70.4)	75(29.6)		
Physical activity					
Yes	267	186(69.7)	81 (30.3)	0.000*	0.232[0.115-0.467]
No	109	99 (90.8)	10(9.2)		
Depression					
Yes	155	140(90.3)	15(9.7)	0.000*	0.204[0.112-0.373]
No	221	145(65.6)	76(34.4)		

*p-value -Highly significant; **The present category includes malnourished and at risk of Malnutrition both

Table 5: Multiple logistic regression analysis of statistically significant factors of Geriatric Depression

Associated factors	aOR (95% CI)	p-value
60-69 years age	0.59 (0.33-1.07)	0.080
Male gender	0.79 (0.45-1.41)	0.432
Married status	1.18 (0.60-2.32)	0.623
Physically active	23.6 (11.4-48.8)	0.000*
Malnourished/ At risk of Malnutrition	0.272 (0.130-0.57)	0.001*

aOR - Adjusted Odds Ratio; CI Confidence Interval; *p-value - Highly significant

DISCUSSION

In the present study, the prevalence of Depression among the geriatric population residing in rural areas of Gautam Budh Nagar is 41.2%, and the prevalence of Malnutrition is recorded at 17.8%. In a similar study conducted in North Karnataka, Hubballi District, the prevalence of Depression in the elderly population was found to be 68.5%, with the majority of the population experiencing mild Depression (42.7%), and the prevalence of Malnutrition was observed to be 16%.¹³ Similar findings were observed in a study conducted in Punjab, Faridkot district, where Depression was 38.7%, and 13.1% of the population had Malnutrition.¹⁷ In a study conducted by Thilak S. in Kannur, Kerala, the prevalence of geriatric Depression was reported to be 72.4% which was quite high as compared to the findings in our study.¹⁸

In a study conducted by TV Sanjay in Bangalore, the prevalence of geriatric Depression was measured at 36%.¹⁹ In a study conducted in Delhi it was revealed that Depression was prevalent in 77% of the population, while 37% were affected by Malnutrition. Higher depressive symptoms were reported by the geriatric population that was malnourished or at risk of Malnutrition.²⁰ In a study conducted in Faridkot, Punjab, by Birpal Kaur, it was found that, according to the MNA Scale, Malnutrition was observed in 13.1% of the participants. When using the GDS Scale, mild Depression was observed in 28.9% of the participants, while severe Depression was identified in 9.8%. Additionally, a significant association between nutritional status and geriatric Depression was noted.²¹

In our study, 55.9% of individuals belonging to Age 60-69 years, 37.2% of individuals belonging to Age 70-79 years, and 6.9% of individuals belonging to Age 80 years and above showed Depression with p value of 0.000, hence showing significant association. Also, as Age advances, chance of Malnutrition increases as in our study, 42.3% participants belonged to age ≥ 80 that were also malnourished. Similar findings were obtained in a study conducted at the Dega Damot district, Northwest, Ethiopia, 87.70 of the individuals age group ≥ 75 years were found to be depressed.²² Another study conducted in Department of Human Nutrition, All India Institute of Medical Sciences New Delhi revealed that 58.9% individuals

belonged to 60-69yrs, 31.2% individuals belonged to 70-79years while 9.9% individuals belonging to 80years and above were malnourished with a p value of 0.001.²³

In our study, 58.5% individuals consumed alcohol and there exists an association with depression and alcohol intake with p value of 0.017. This is in concordance with similar findings of a study which revealed that 65.7% of participants who consumed alcohol were also depressed.²⁴

In our study, it was found that physical activity and Malnutrition or risk of Malnutrition were significantly associated with Geriatric Depression 76.9% of participants did not perform any sort of physical activity and its association with Depression comes out with a p value of 0.004. Also, 46.2% of participants who were physically inactive were also malnourished with a p value of 0.000. These findings were similar to a study conducted in India.²⁴

In a community-based comparative cross-sectional study conducted in 600 older adult residents (aged ≥ 60 years) of three rural communities of Bangladesh active daily life was significantly ($p < 0.01$) less prevalent in the people suffering with depression.²⁵

CONCLUSION AND RECOMMENDATIONS

The prevalence of geriatric Depression and Malnutrition in the population that was studied was found to be on the higher side. It suggests that there exists a strong association between geriatric Depression and geriatric nutritional status. The poorer the nutritional status, the higher was the prevalence of geriatric Depression. The findings underscore the importance of addressing both geriatric Depression and nutritional status for adequate care and intervention in the geriatric population. Keeping up a healthy lifestyle, a supportive family structure, and good physical health are a few things that help lower melancholy rates in the senior population. Adopting a comprehensive and holistic approach to geriatric care and integration within the broader healthcare system is the need of the hour. This approach recognizes the unique needs and challenges faced by the elderly population and aims to create a supportive environment that enhances their quality of life.

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