



MEDICATION ADHERENCE, COMPLIANCE AND MALNUTRITION IN RURAL GERIATRIC POPULATION IN AMALAPURAM

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ABSTRACT

Background: The patient's compliance to treatment of chronic illnesses is about 50% globally, which is far less than this in developing countries like India. Malnutrition is multifactorial due to the change of body composition with a progressive increase in fat and a decline in lean body mass with advancing age. This study aimed to assess the malnutrition prevalence and medication adherence among the rural geriatric population. **Methodology:** A cross-sectional study was performed among the rural geriatric population of the amalapuram town. Morisky Medication Adherence Scale (MMAS) eight-question version to evaluate medication adherence and patient compliance. Mini Nutrition Assessment (MNA) tool is used to assess the malnutrition status of the study population. **Results:** A total of 109 people participated in the study, and 56 (51.4%) were male, and 53 (48.6%) were females. 20 (18.3%) people were malnourished, and 82 (75.2%) were at risk of malnutrition. 58 (53.2%) were low medication adherence. **Conclusion:** Our study revealed that more than half of the geriatric population were at risk of malnutrition and had low medication adherence. Measures and interventions at the patient level, especially in rural settings, need to be initiated and extended by strong motivation and education about the importance of drug intake and prevalent malnutrition among the age group.

KEYWORDS : Compliance, Geriatric population, Malnutrition, Medication Adherence, Rural setting

INTRODUCTION

A demographic transition is happening in India through which the mark of elderly population will reach around 324 million by the year 2050 [1]. Nearly 85% of all the diseases being diagnosed among the elderly include diabetes mellitus, hypertension, chronic obstructive pulmonary disease (C.O.P.D.), osteoarthritis, Cataract, ischemic heart disease, benign prostatic hypertrophy, and upper and lower gastrointestinal dysmotility disorders like dyspepsia and constipation [2,3]. The elderly population is also more susceptible to infectious diseases due to the age-related (senile) physiological changes and alterations in the host defences and immunogenic responses. The physiological changes and alterations in the geriatric age group can result in nonspecific and subtle clinical manifestations, making the diagnosis difficult, hence causing a higher prevalence of mortality and morbidity [4,5]. Medication Adherence refers to the "range of patient's attitude corresponding or conforming to the medical advice given", and Compliance of the Patient is described as the "extent or degree to which a patient adequately follows the medical advice given" [6]. The mean medication adherence of the patients declines from around 80% in the elderly patients who take the medication once daily (O.D.) to 50% in those patients who take medicine four times a day (QID) [7]. The medication compliance of the patients towards treating chronic illnesses like diabetes and hypertension is around 50%, which could be much lesser in developing countries like India, which need to be evaluated timely [8]. Studies like ours will help to assess this burden of poor medication adherence and patient compliance, which can be further implicated in framing the healthcare programs and interventions.

Malnutrition is a state of disturbance of energy intake, protein and other nutrients, which results in changes in body size, shape, composition, and function [9]. Malnutrition is a common and unrecognized disorder in the elderly, affecting up to 25% of elderly patients at home and more than 50% at rehabilitation institutions [10]. Malnutrition is a multifactorial entity, which can be predisposed by several factors affecting the alterations in the body composition with progressive elevation in the total body fat and decrease in the lean body

mass with progressing age. Malnutrition can result from various health aspects like chronic diseases, medication-induced effects, gastrointestinal disturbances like dysmotility and constipation, depression, malignancies, alcoholism, etc. All these health and disease aspects are strongly associated with malnutrition, medication adherence, and patient compliance [11].

Most of the predisposing aspects causing malnutrition might coincide with poor medication adherence and patient compliance among the elderly. Hence, poor medication adherence, reduced patient compliance and malnutrition are the independent risk factors for morbidity and mortality in the geriatric population. There are no prominent studies in India addressing the current topic of interest, especially in rural settings. Hence, this study was the first of its kind in the lines of the geriatric population of the rural setting, assessing both malnutrition and medication adherence.

Methodology

A Cross-sectional observational study was conducted in rural areas of amalapuram town, Andhra Pradesh, India. The study period was December 2021 to August 2023 (21 months). The study population was the rural geriatric population (60+ age) of the study region. The inclusion criteria were geriatric population with at least one underlying disease condition, and given consent was included in the study. People who were healthy and didn't give consent were excluded from the study.

The sample size was calculated using the Raosoft sample size calculator (<http://www.raosoft.com/samplesize.html>). Considering margin of error as 10%, confidence level as 95% and response rate as 10% - the estimated sample size was 96. Random sampling method was used and a structured household interview was designed to assess the study participants via door-to-door basis.

The study tools used were Morisky Medication Adherence Scale (MMAS) eight-question version [12] to evaluate medication adherence and patient compliance and the Malnutrition by Mini Nutrition Assessment (MNA) tool [13] to assess the malnutrition status. In MMAS, a score of 8 is "High

Adherence", a score of 6 to 8 is "Medium Adherence", and a score of less than 6 is "Low Adherence". In MNA tool, a score of 17 to 23.5 is considered as at "Risk of Malnutrition", a score of less than 17 is considered "Malnourished", and a score of 24 to 30 is considered "Normal Nutritional Status".

The Socio-demographic details were collected along with MMAS and MNA study tools. Informed consent was obtained from all the study participants after explaining the purpose of the study. Data collected from the assessment tools were entered into Microsoft Excel 2019 and statistical analysis was done using SPSS version 24.0. Distributed variables were expressed using means with standard deviation SD, and Categorical variables were expressed using numbers and percentages. A Chi-square test was performed to assess the association and significance of categorical variables, p-value ≤ 0.05 was considered statistically significant.

This study was approved by Institutional Ethical Committee.

RESULTS

A total of 109 people participated in the study, and 56 (51.4%) were male, and 53 (48.6%) were females. The mean age was 72.55 ± 6.45 years. 42 (38.5%) have both diabetes & hypertension, 37 (33.4%) have only hypertension, 23 (21.1%) have only diabetes, 5 (4.5%) have asthma, 2 (1.83%) have coronary artery disease. 37 (33.4%) study participants were from the lower middle class, and 22 (20.2%) were from the lower class. 40 (36.7%) study participants were illiterates, and 29 (26.6%) were studied till primary school. 38 (34.9%) study participants were daily labourers, 29 (26.6%) were homemakers and 13 (11.9%) were farmers. 42 (38.5%) study participants were living single at home, 36 (33%) were living with a life partner and children, and 31 (28.4%) were living with a life partner only.

Malnutrition by Mini Nutrition Assessment (MNA) Tool Assessment Score

The mean assessment score is 9.18 ± 2.476 , and 90.8% (99) of study participants underwent further assessment by MNA tool.

Total Screening Score (Total MNAS - 30 points)

The mean total screening score is 18.743 ± 3.654 . 82 (75.2%) study participants were found to be at risk of malnutrition, 20 (18.3%) are malnourished, and only 7 (6.4%) had normal nutritional status.

Table - 1: P-values of Malnutrition Levels & Medication Adherence Vs Socio-demographic Profile (n= 109)

Malnutrition levels Vs Socio-demographic profile						
Parameter	Socio-economic status	Malnourished	At risk of malnutrition	Normal Healthy	Total n= 109	P-value
Malnutrition level	lower class	2	18	2	22	0.000 Significant
	upper lower	0	9	0	9	
	lower middle	6	27	4	37	
	upper middle	7	18	0	25	
	upper class	5	10	1	16	
Parameter	Gender	Malnourished	At risk of malnutrition	Normal Healthy	Total n= 109	P-value
Malnutrition level	Male	11	42	3	56	0.000 Significant
	Female	9	40	4	53	
Medication Adherence Vs Socio-demographic profile						
Parameter	Socio-economic status	High adherence	Medium adherence	Low adherence	Total n= 109	P-value
Medication Adherence	lower class	1	9	12	22	0.000 Significant
	upper lower	1	4	4	9	
	lower middle	5	16	16	37	
	upper middle	1	8	16	25	
	upper class	1	5	10	16	
Parameter	Educational status	High adherence	Medium adherence	Low adherence	Total n= 109	P-value

Morisky Medication Adherence Scale (MMAS)

The mean MMAS score is 4.99 ± 2.11 . Only 9 (8.3%) have high adherence to medication, and 58 (53.2%) have low medication adherence.

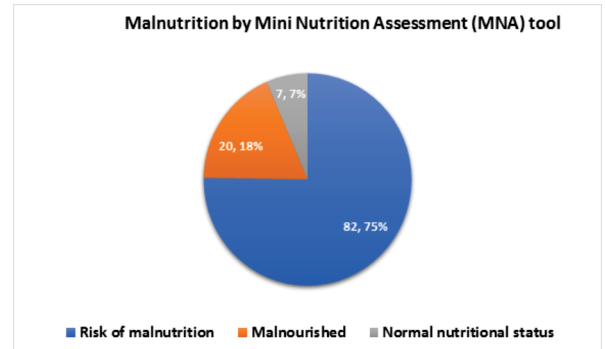


Figure - 1: Malnutrition by Mini Nutrition Assessment tool (n=109)

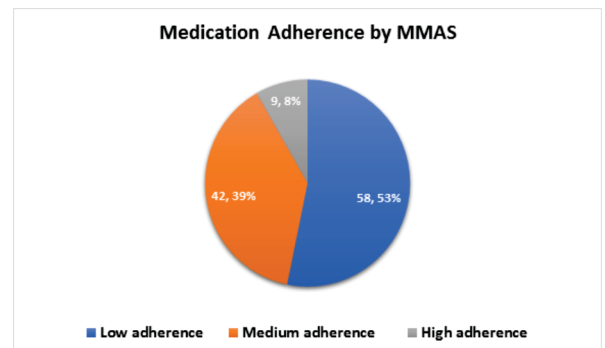


Figure - 2: Medication Adherence by Morisky Medication Adherence Scale (n= 109)

Socio-economic status was found to be statistically significant with level of malnutrition with P value = 0.000. Gender was found to be statistically significant with level of malnutrition with P value = 0.000 [Table - 1]. Socio-economic status was found to be statistically significant with medication adherence with P value = 0.000. Educational status was found to be statistically significant with medication adherence with P value = 0.000 [Table - 1]. Medication adherence was found to be statistically significant with level of malnutrition with P value = 0.000 [Table - 2].

Medication Adherence	Illiterate	2	19	19	40	0.000 Significant
	Primary school	2	11	16	29	
	Middle school	2	3	8	13	
	High school	3	5	11	19	
	Intermediate	0	1	1	2	
	Graduate	0	3	3	6	

Table - 2: P-values of Malnutrition Levels Vs Medication Adherence (n = 109)

Malnutrition levels Vs Medication Adherence						
Parameter	Malnutrition Levels	High adherence	Medium adherence	Low adherence	Total n=109	P-value
Medication Adherence	Malnourished	0	1	19	20	0.000 Significant
	At risk of malnutrition	9	38	35	82	
	Normal nutritional status	0	3	4	7	

DISCUSSION

In this study, we used validated scales for assessing medication adherence and malnutrition. Good medication adherence is essential to achieving good prognostic status for patients with non-communicable diseases. It must be established precisely by the primary care treating doctors and family physicians providing healthcare services for most non-communicable patients in India.

Govind R et al. assessed malnutrition among older adults in rural areas of south India; 245 people participated in the study, and the prevalence of malnutrition was 14.3%, and 44.1% were at risk of malnutrition, which is less than our study [14]. Krishnamoorthy Y et al. assessed malnutrition and its associated factors among the elderly population of rural Puducherry; 297 people participated in the study, and the prevalence of malnutrition was found to be 17.9%, and 58.8% were at risk of malnutrition, which is very less than our study [15]. In a study by Srivalli B D et al., a cross-section study was conducted among rural areas of Karnataka to assess medication compliance and medication safety among geriatric patients. 118 people participated in the study, and 46.6% were fully adherent to the prescribed medication, which was higher than our study [16].

The major strengths of our study are the use of validated scales for assessing medication adherence and malnutrition. To achieve good prognostic status for patients with non-communicable diseases, good adherence to medications is essential, which must be established precisely by the primary care treating doctors and family physicians providing healthcare services for most patients with NCDs in India.

CONCLUSION

Our study revealed that more than half of the geriatric population were at malnutrition risk and had low medication adherence. It is essential to assess the nutritional status of elderly patients early and its correlation with medication adherence and patient compliance. It will help to minimize devastating consequences on geriatric patients and the health care system, especially in the rural setting. Measures and interventions at the patient level, especially in rural settings, need to be initiated and extended by strong motivation and education about the importance of drug intake and prevalent malnutrition among the age group.

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