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NEWS & VIEWS

SCOPE OF THE JOURNAL

Indian Journal of Gerontology (ISSN : 0971-4189) is a peer-reviewed and UGC Approved Journal, and is indexed by - the Indian Citation Index, Google Scholar, CNKI Scholar, EBSCO Discovery, and UGC Group 1. Started in the year 1969, is the first in India, and 18th in the world. It publishes papers related to the Biological aspects of Human ageing, animal ageing, and ageing of plants. It also publishes papers on geriatrics, geriatric nursing, and geriatric physiotherapy (Clinical aspects). The social aspects of ageing cover, Sociology, Social work, Anthropology, Psychology, Economics, Demography, and other Social Sciences.

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New Life Member - L636, Dr. Sambaran Mondal, UGC Junior Research Fellow, Department of Food and Nutrition, West Bengal State University, Kolkata-700126

L637, Dr. Shankarashis Mukherjee, Professor & Head, Department of Food and Nutrition, West Bengal State University, Kolkata-700126

Assessment of Functional Status and Risk of Malnutrition amongst the Working and Non-working Older Adults in Kolkata

Sweata Rani Rai, and Samina Mandsaurwala

Department of Food Science & Nutritional Management,
J.D. Birla Institute (affiliated to Jadavpur University) Kolkata – 700020

ABSTRACT

The study was conducted to compare the nutritional status, functional status, and level of physical activity of the working (N=100), and non-working (N=100), aged 60 years and above, elderly living in Kolkata, (West Bengal). Standardized tools were used primarily the Mini Nutritional Assessment to determine the nutritional status, the Katz Index of Independence in daily Activities to assess the functional status, and the Physical Activity Scale for the Elderly (PASE) to assess the level of physical activity. SPSS version 20.0 was used to analyse the collected data and statistical tests like ANOVA, T-test, and Pearson's correlation were used to statistically analyse the results. The study showed that malnutrition and the risk of malnutrition were present among both the working and non-working elderly population. However, it was slightly higher among the non-working elderly population. Among the working population, 13 percent were malnourished, 47 percent were at risk of malnutrition, and among the

non-working population 20percent were malnourished, and 50percent were at risk of malnutrition. Functional ability in terms of activities of daily living was higher among the non-working elderly in comparison to the working elderly. The level of physical activity declined with age and was higher for males than females in both groups.

Keywords : Ageing, Malnutrition, Mini Nutritional Assessment (MNA), Functional decline, Physical activity scale for Elderly (PASE)

Older persons may experience both malnutrition and functional disability simultaneously. Several studies have found a substantial link between functional impairment and the likelihood of malnutrition in older persons (Cereda, *et al.*, 2008; Rudnicka, *et al.*, 2020;). Malnutrition is a serious elderly issue. Inadequate nutritional status is characterized by insufficient dietary intake, poor appetite, muscle wasting, and weight loss, which has adverse effects on physiological functions and other clinical outcomes such as decreased quality of life, higher infection and complications, muscle wasting, hospitalization, and even higher mortality (Hairi, *et al.*, 2010; Fávoro-Moreira, *et al.*, 2016; Tamang, *et al.*, 2019). Early identification of the elderly at risk of malnutrition, or a lack of caloric intake and nutritional inadequacy, is critical for maintaining health, independence, quality of life, and lifespan (Andre, *et al.*, 2013).

One of the aims of effective ageing is the preservation of function and independence. Through functional assessment, the physical and cognitive capacities required for an elderly patient to live an independent life may be completely assessed (Forster & Gariballa, 2005). Specific methods and scales can identify a modest decline of functional ability in an elderly person, which is important since it may suggest the onset of a disease. Elderly people have a variety of issues that are sometimes difficult to identify clinically. As a result, organized assessment of functional status is critical in the older population for

the purpose of diagnosis and comprehensive management (Suzman, *etal.*, 2015; Corcoran, *et al.*, 2019).

Many causes of malnutrition affect the old population and can be prevented if treated in advance (Rausch, *et al.*, 2022). A longer life gives opportunities not only for the elderly and their families but also for societies at large. Older people can make significant contributions to their families and communities. It is especially important for the elderly to adopt food and lifestyle choices that lower the risk of illnesses and malnutrition and enhance the chances of healthy and effective ageing (Fávaro-Moreira, *et al.*, 2016). This could be accomplished through a thorough assessment and understanding of their dietary preferences and habits, along with regular screening, diagnosis, assessment, and treatment as it may improve both the nutritional and functional status of the aged (Dent, *et.al.*, 2012).

The present study aimed to assess the nutritional status, functional status, and level of physical activity in the selected population.

- (a) To compare the risk of malnutrition amongst the target population and associate the impact of socio-economic variables on the nutritional status.
- (b) To assess the functional status and level of physical activity in relation to the nutritional status.
- (c) To understand the dietary intake pattern of the respondents.

METHOD

Sample

A total of 200 respondents, aged 60 years, 100 non-working elderly living in the urban areas of Entally, Alipore, and Topsia (Kolkata), and 100 working elderly in the areas of Entally, Park Circus (Kolkata) were selected by random sampling method. The working elderly respondents were selected from different

occupational backgrounds (security guards, fruit and vegetable vendors, rickshaw pullers, and elderly working in corporate offices).

Data Collection

The data was collected through telephonic interviews as well as face-to-face interviews by using a structured and standardized questionnaire. An informed consent was obtained from each participant.

Mini Nutritional Assessment (MNA), a nutrition screening tool was used to assess the risk of malnutrition for the elderly. It comprises 18 items, which are based on the following components: anthropometric measurements, dietary questionnaire, global health and social assessment, and subjective assessment of health and nutrition. Subjects were weighed with a floor scale to the nearest 0.1 kg, and height, mid-arm circumference, and calf circumference were measured to the nearest 0.1 cm. Interpretation of scores was done as follows: Score <17: Malnourished, Score 17-23.5: at the risk of malnutrition Score >23.5: Well-nourished (Corish & Bardon, 2019; Guigoz & Vellas, 2021; Guigoz, *et al.*, 2002;).

Katz Activities of Daily Living (Katz ADL) was used to assess the functional status and the ability to perform activities of daily living such as bathing, dressing, toileting, feeding etc. (Sharma, *et al.*, 2014; Peter, *et al.*, 2022). A score of 6 suggests full function, 4 indicates moderate impairment and 2 or less indicates severe functional impairment. Physical activity was assessed using the Physical Activity Scale for the Elderly (PASE) which is an easily administered instrument that measures the level of physical activity (Logan, *et al.*, 2013).

To understand the food intake pattern of older adults, the 24-hour dietary recall method was used.

Statistical Analysis

The collected data were coded and analysed using SPSS-20 and plotted into different frequency tables and graphs. The demographic and socio-economic characteristics were summarized using descriptive statistics. One-way ANOVA was performed to determine the associations between MNA score and the socioeconomic factors. Pearson correlation was used to analyze both the relationship between nutritional status (MNA score) and functional status (Katz score) and nutritional status (MNA score) and physical activity (PASE score).

Results and Discussion

Table 1

Descriptive statistics of general characteristics of the respondents

S.No.	Characteristics	Working elderly population (N=100)		Non-Working elderly population (N=100)	
		Mean	Standard deviation	Mean	Standard deviation
1	Age (in years)	66.4	4.38	74.6	8.57
2	Weight (in kg)	65.48	8.87	68.29	12.03
3	Height (in cm)	166.49	7.26	163.64	8.95

Table 1 shows the descriptive statistics of the study population. The participants had an average age of 74.6 ± 8.57 years in the non-working elderly population and 66.4 ± 4.38 years in the working elderly population. The average weight of the non-working elderly population was calculated as 68.29 ± 12.03 kilograms and the average height was 163.64 ± 8.95 . Whereas in the working elderly population, the average weight was calculated as 65.48 ± 8.87 kilograms and the average height was 166.49 ± 7.26 .

Anthropometric Assessments

Anthropometric evaluation is a crucial feature of geriatric nutritional evaluation for determining malnutrition, detection of

muscular mass loss, fat mass gain, and adipose tissue redistribution (Sánchez-García, *et al.*, 2007). Anthropometry in elderly individuals includes body weight, height, BMI, waist circumference, hip circumference, waist-to-height, waist-to-hip ratio, triceps skin fold thickness, and mid-upper arm circumference. These measurements can be used to determine malnutrition status and detection of chronic and acute diseases and to assess risk factors for functional decline in the elderly.

Assessment of Mid-Upper Arm Circumference (MUAC)

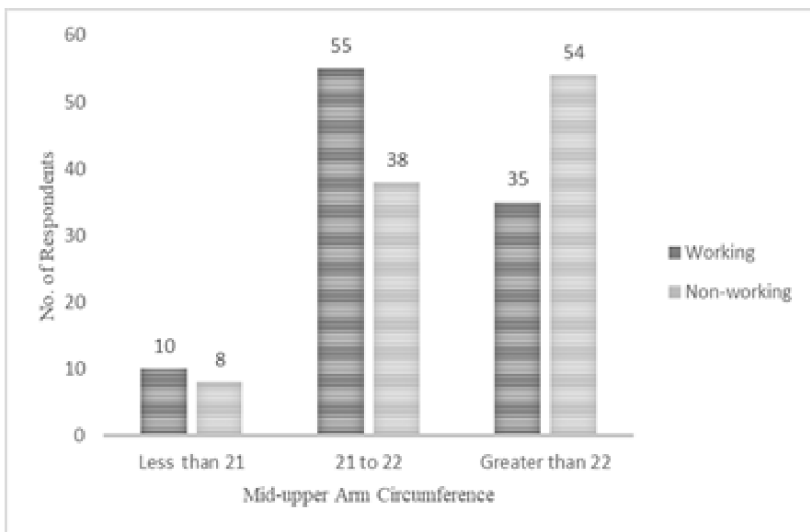


Figure 1: Mid-upper arm circumference (MUAC) measurement of the respondents

It can be seen from Figure 1, that in the case of the working elderly population 10 per cent had a mid-upper arm circumference of less than 21 cm, 55 per cent had a mid-upper arm circumference of 21 to 22 cm and 35 per cent had a mid-upper arm circumference (MUAC) of greater than 22 cm. Whereas in the case of the non-working elderly population, 8 per cent had a mid-upper arm circumference of less than 21 cm, 38 per

cent had a mid-upper circumference of 21 to 22 cm and 54 per centper cent had a mid-upper circumference of greater than 22 cm. A low mid-upper arm circumference (MUAC) is often associated with mortality, muscle-related disability and functional decline in older adults(Sukkriang and Somrak, 2021).

Assessment of Calf Circumference (CC)

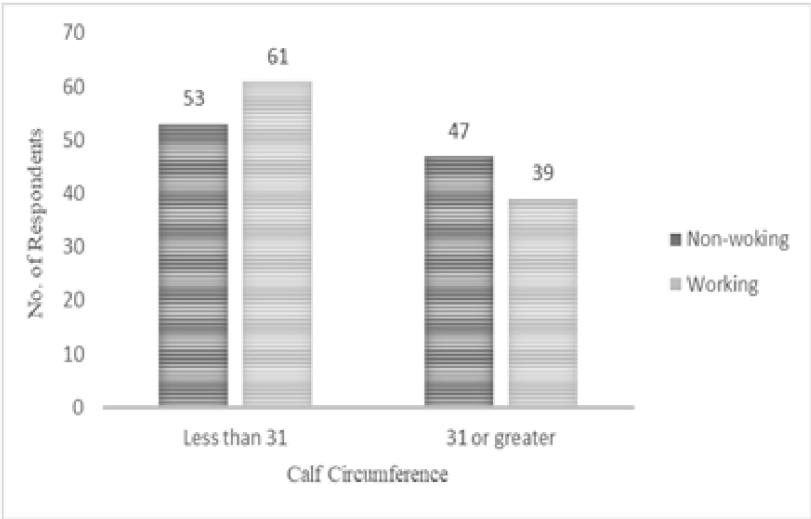


Figure 2: Calf circumference of the respondents

Figure 2 shows that in case of the working elderly population, 61per cent had a calf circumference of less than 31cm and 39per cent had a calf circumference of 31 cm or greater. In the case of the non-working elderly population, 53per cent had a calf circumference of less than 31 cm and 47per cent had a calf circumference of 31 cm or greater. Calf circumference is also used as a surrogate marker for the diagnosis of sarcopenia and a calf circumference of less than 31 cm indicates a higher risk of musclewasting which indicates the risk of sarcopenia and frailty in older adults(Borges, *et al.*, 2022).

Assessment of Body Mass Index (BMI)

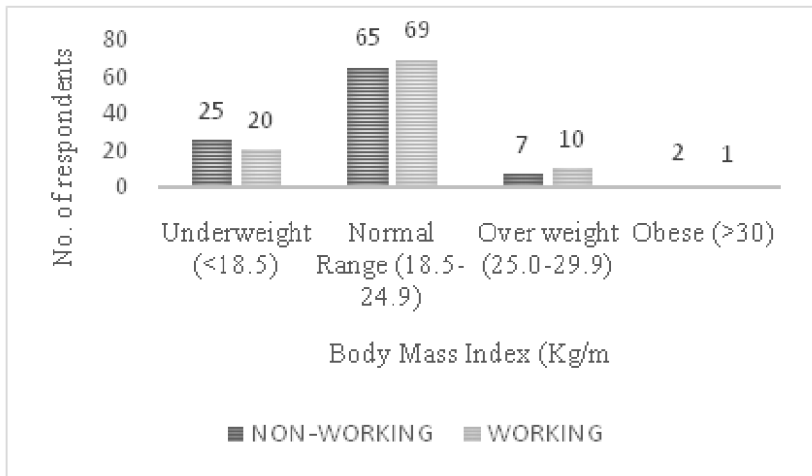


Figure 3: BMI of the respondents

It can be seen from Figure 3, that in the case of the non-working population, 25 per cent of the respondents were underweight, 65 per cent were in the normal range, 7 per cent were overweight and 2 per cent were obese. In the case of the working population, 20 per cent of the respondents were underweight, 69 per cent were in the normal range, 10 per cent were overweight and 1 per cent were obese. Changes in body composition that occur during old age influence the nutritional status of an old adult. In older age, as fat mass increases and gets redistributed, body composition changes. Therefore, the body mass index (BMI) classification may not accurately reflect risk in older adults (60+) (Agarwalla, *et al.*, 2015).

Assessment of nutritional status through Mini Nutritional Assessment (MNA)

Table 2
Assessment of Nutritional status of respondents

Category	Age-wise distribution	Nutritional Status (MNA score)			Total
		Malnourished (>17)	At risk of Malnutrition (17-23.5)	Normal nutritional status (24-30)	
Non-working elderly population (n=100)	60-69 years	0	9	23	32
	70-79 years	7	28	3	38
	80 years and above	12	14	4	30
Working elderly population (n=100)	60-69 years	1	31	36	68
	70-79 years	12	16	4	32
	80 years and above	-	-	-	

Table 2 presents an analysis of the nutritional status distribution among the non-working and working elderly population categorized by age. In the non-working elderly population, within the 60-69 age group, no individuals were identified as malnourished, 9 were identified as being at risk of malnutrition, and 23 had a normal nutritional status. In the 70-79 age group, 7 individuals were identified as malnourished, 28 were considered at risk of malnutrition, and only 3 displayed a normal nutritional status. In the 80 years and above age group, 12 individuals were classified as malnourished, 14 were at risk of malnutrition, and 4 maintained a normal nutritional status. Conversely, among the working elderly population, within the 60-69 age category, 1 individual was identified as malnourished, 31 were considered at risk of malnutrition, and 36 exhibited a normal nutritional status. In the 70-79 age group, 12 individuals were categorized as malnourished, 16 were at risk of malnutrition, and 4 displayed a normal nutritional status. Notably, in the 80-year-old and above age group, nutritional status assessment was not possible due to the absence of working elderly individuals in this

age bracket. In both groups respondents with a normal nutritional status majorly belong to the age group of 60-69 years. This shows that old age is associated with a decline in appetite and food consumption that, in turn, affects the nutritional status.

Association of various socio-economic variables & nutritional status of respondents

Table 3

Impact of socio-economic variables on MNA score

Variables		Sum of squares	Df	Mean Square	F	Sig.	Result
Age	Between Groups	39.374	16	2.461	6.810	.000	Null hypothesis rejected
	Within Groups	66.126	183	.361			
	Total	105.500	199				
Gender	Between Groups	3.217	16	.201	.883	.589	Null hypothesis accepted
	Within Groups	41.663	183	.228			
	Total	44.880	199				
Education	Between Groups	220.059	16	13.754	30.000	.000	Null hypothesis Rejected
	Within Groups	83.896	183	.458			
	Total	303.955	199				
Annual Family Income	Between Groups	264.711	16	16.544	203.620	.000	Null hypothesis Rejected
	Within Groups	14.869	183	.081			
	Total	279.580	199				
No. of employed family members	Between Groups	80.008	16	5.000	11.333	.000	Null hypothesis Rejected
	Within Groups	80.747	183	.441			
	Total	160.755	199				

Table 3 shows a significant $p\text{-value} < 0.05$ which has been obtained with respect to all independent variables except gender which states that age, education, annual family income, and number of family members employed have a significant impact on MNA score. The nutritional status is impacted by a loss in appetite and food consumption that is linked to ageing (Donini, *et.al.*, 2013). As a result of their lack of cooking skills or lack of understanding about how to make good food choices, older people with low educational levels have poor nutritional status. Reduced income also makes older persons more susceptible to food insecurity, which puts them at risk for malnutrition.

Assessment of functional status using Katz Activities of Daily Living (ADL) score

Table 4

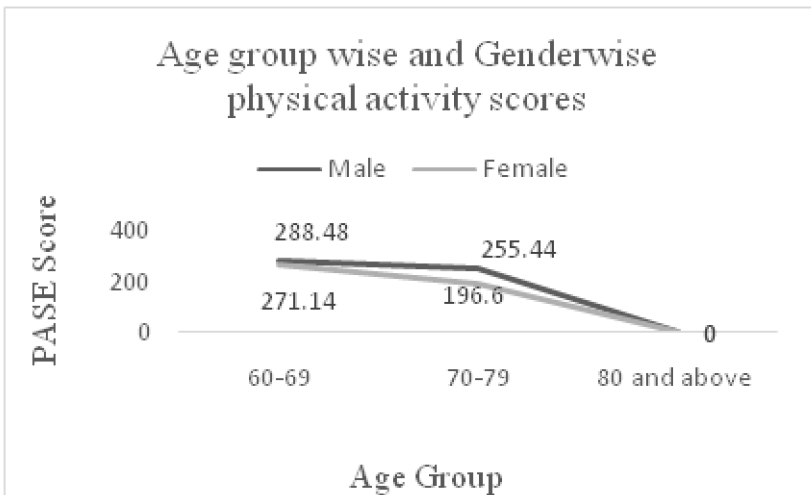
Assessment of Functional status in respondents using Katz ADL scores

Category	Age-wise distribution	Katz ADL score			Total
		Severely dependent	Moderately dependent	Functionally able	
Non-working (n=100)	60-69 years	0	0	33	33
	70-79 years	2	13	22	37
	80 years and above	5	14	11	30
Working (n=100)	60-69 years	-	-	68	68
	70-79 years	-	-	32	32
	80 years and above	-	-	-	-

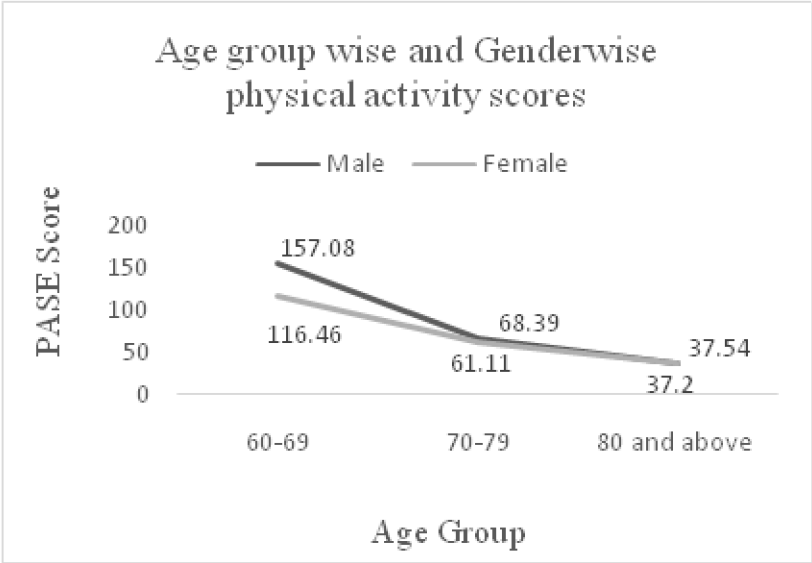
Table 4 presents an overview of the age-based distribution of activities of daily living (ADL) performance among both non-working and working elderly individuals. Within the non-working elderly participants, for those aged 60-69, there were no individuals with severe dependency, no individuals with moderate dependency, and 33 individuals who demonstrated functional

independence in performing ADLs. In the 70-79 age group, 2 individuals experienced severe dependency, 13 individuals exhibited moderate dependency, and 22 individuals maintained functional independence in ADLs. For those aged 80 years and above, 5 individuals were severely dependent, 14 individuals displayed moderate dependency, and 11 individuals exhibited functional independence in their ability to perform ADLs. Among the working elderly, all the respondents were independent enough to perform the daily activities of living and needed no assistance to carry out those activities. In the case of the working elderly population, the dependency factor is less as compared to the non-working elderly due to the fact that they still continue to contribute to the family income even after their retirement period. ADL is used to assess a person's functional status. The loss of the ability to accomplish ADLs results in dependence on other individuals and/or mechanical equipment. The inability to do basic daily chores may result in unsafe situations and a low quality of life (Dombrowsky, 2017).

Assessment of physical activity using the Physical Activity Scale for the Elderly (PASE)



(a)



(b)

Fig 5. Mean PASE score for males and females by age for
(a) Working Elderly Population (b) Non- Working Elderly Population

It can be seen from Figure5 that in the case of the working elderly population, the score ranged from 76.87 to 612.28. The mean score was 275.0 with a standard deviation of ± 95.44 . In the case of non-working elderly population, the score ranged from 2.2 to 233.25. The mean score was 77.09 with a standard deviation of ± 52.61 . PASE scores declined with age and were higher for males than females in each age group. Physical activity is a modifiable behavioural risk factor related to the maintenance of health and effective function in older people. Maintaining an active lifestyle in old age has been associated with a decreased risk for falls and fractures as well as preventing each associated decline in bone density, cardiovascular fitness, and muscular strength(Cvecka, *et al.*, 2015; Arnadottir, 2016).

Relationship between nutritional status (MNA score) & functional status (Katz ADL score)

Table 5

Pearson’s correlation between MNA Score and Katz ADLscore

	Katz ADLScore	
MNA Score	Pearson Correlation	.776
	Sig. (2-tailed)	.000

As shown in Table5, Pearson’s correlation between Katz’s Score and MNA score was calculated as 0.776 indicating a strong positive correlation which exists between activities of daily living and the nutritional status. A positive correlation signifies that as the MNA scores increased, the Katz scores increased simultaneously indicating a strong relation between the two. The p-values for the correlation between Katz score and MNA score is less than the significance level of 0.01 which indicates that the correlation coefficients are significant. In the elderly,malnutrition is strongly associated with functional status.It suggests that limitations in functional status involving functions related to food intake such as eating, food preparation, and grocery shopping can lead to inadequate food intake, eventually leading to malnutrition (Abate, *et al.*, 2020).

Relationship between nutritional status (MNA score) & physical activity (PASE)in the respondents

Table 6

Pearson’s correlation between MNA Score and PASE Scores

	PASE Score	
MNA Score	Pearson Correlation	.734
	Sig. (2-tailed)	.000

As shown in Table 6, the Pearson’s correlation value was 0.734 indicating a strong positive correlation existing between level of physical activity and the nutritional status. A positive correlation signifies that as the MNA scores increased, the PASE Scores increased simultaneously. The p-values for the correlation between Katz score and MNA score was less than the significance level

of 0.01 which indicates that the correlation coefficients was significant. Older adults are susceptible to physical under-performance, sarcopenia, and malnutrition. Physical performance and malnutrition are regarded to have complicated causes and connections. Through alterations to the nervous and skeletal systems, loss of muscle mass and strength, and malnutrition, all have an impact on physical performance which have a negative impact on health, lowering quality of life, and increasing risk of mortality and morbidity (Langhammer, *et al.*, 2018).

Dietary Assessment

Table 7

24- hour recall and dietary intake of the respondents

Macronutrient	Non-working elderly respondents				Working elderly respondents			
	Male (N=44)		Female (N=56)		Male (N=88)		Female (N=12)	
	Mean	RDA	Mean	RDA	Mean	RDA	Mean	RDA
Energy (Kcal)	1795.75	1450-1900	1285.42	1300-1650	1899.34	1450-1900	1278.29	1300-1650
Carbohydrates(g)	213.28	220-300	185.34	200-275	250.89	220-300	220.67	200-275
Protein (g)	44.56	55	39.66	50	43.12	55	41.45	50
Fats (g)	42.67	35-40	45.78	28-33	39.45	35-40	30.32	28-33

Table 7 shows that in female elderly respondents, the calorie consumption is less compared to the Recommended Dietary Allowance (RDA) compared to males who meet the requirements. Rice being the staple cereal of Kolkata, is often widely consumed followed by whole wheat consumption which can be attributed to a high carbohydrate intake pattern (Satusap, *et al.*, 2014). Protein consumption is seen to be lower in both males and females. Protein requirement was slightly low as compared to the requirements both in elderly working and non-working groups. A low-protein diet can be a major contributor to malnutrition in older adults (Baum, *et al.*, 2016). A low protein, high carbohydrate, and high fat diet may lead to increased deposition of fat in the body

resulting in obesity, and can also lead to muscle wastage which in turn affects the functional ability of old adults. Dietary inadequacy in non-working elderly leading a sedentary lifestyle could be due to a decrease in appetite which results in a decreased food intake and therefore failure to meet the daily recommended allowances. Dietary inadequacy in working elderly could be due to skipping meals while they are at their workplace, not eating the correct number of meals, lack of proper knowledge about nutrient-dense diets, and lack of resources.

CONCLUSION

Old age is an inevitable, undesirable, and problem-ridden phase of life. Malnutrition and population ageing are both global healthcare concerns since they affect a growing share of the world's population. People are increasingly prone to illness and impairment as they become older. Healthy ageing is crucial; however, nutrition and health are frequently overlooked. As nutrition plays a key role in the health and function of senior individuals, it is important to meet the food and nutritional demands of older people in order to maintain health and quality of life.

In light of the findings from this study, it may be observed that malnutrition and the risk of malnutrition were present amongst both the working and non-working elderly population residing in Kolkata, (West Bengal). Among the working respondents, 13 percent were malnourished, 47 percent were at risk of malnutrition, and among the non-working respondents 20 percent were malnourished, and 50 percent were at risk of malnutrition. The prevalence of malnutrition as per the MNA scores was slightly higher among the non-working elderly respondents as compared to the working elderly population. The non-working elderly respondents led a sedentary lifestyle which could have caused a decrease in appetite and lower food intake and thus a higher risk of malnutrition. Since an inadequate nutritional status is a critical factor for malnutrition and the working-class elderly population had inadequacy in terms of dietary diversification, the risk of

malnutrition was also high in this group. Functional ability was higher among the working elderly in comparison to the non-working elderly. The level of physical activity declined with age and was higher for males than females in both groups.

It is widely recognized that functional disability is a major contributor to malnutrition among older people, and at the same time, malnutrition risk is a major contributor to functional inability. Malnutrition risk increases the risk of incident functional decline in older adults and worsens physical performance. Therefore, there is a need to regularly include nutritional and functional assessment and intervention programs for early intervention measures in order to prevent the consequences of malnutrition and functional inability.

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Intervention for Psychophysiological Well-being of Older Adults – A Pilot Study

Selvaraj, P., and Sasi, V.

Vinayaka Mission's College of Nursing, Puducherry,
Vinayaka Mission's Research Foundation, Salem, (T.N.)

ABSTRACT

The present study aimed to evaluate the effects of interventions on the psychophysiological well-being of 30 older adults, aged 60 years and above selected by random sampling method. 15 elderly subjects were given intervention (experimental group, 9 males and 6 females) and 15 subjects were not given any intervention (control group, 12 males and 3 females). The research tool used in this study was an interview schedule, consisting of two parts: Part I dealt with the demographic characteristics of older adults, while Part II comprised the Modified Psychophysiological Well-being scale, developed by the McKinley Health Centre, University of Illinois Urbana-Champaign (2000). An interview technique was adapted to collect data from the elderly. Older people in the experimental group received interventions (comprising exercises, counseling, and reminiscence therapy), while those in the control group continued with their routine activities. Post-test data were collected from older

people in both groups after one month. The results indicated that significant improvements were observed after the intervention in physiological well-being, psychological well-being, and social well-being. Moreover, the overall psychophysiological well-being of the older adults also demonstrated improvement in well-being ($t = 4.623$, $P < 0.05$) after engaging in the intervention activities.

Keywords : Physiological Well-being, Psychological Well-Being, Social Well-Being, Psychophysiological Well-Being, Older Adults, Elderly, Interventions.

As individuals age, changes in the body highlight its significance, representing a phase of life where physical strength diminishes, and emotional and psychological sensitivity increases. It is considered the second childhood for older adults, as they become more dependent on others due to weakened body systems. The situations faced by older people, such as family members being occupied with their own lives, lead to increased vulnerability to mental health issues.

In old age, subjectivity and the search for meaning are more prominent, whereas physical frailty makes them reliant on assistance from others. Fearful anticipation of life's course leads to anxiety, and factors like low income and a decline in social status can contribute to depression at this age. Shifting family values, financial obligations of children, and instances of neglect and abuse are the most common reasons for gaps in the family (Barakat, *et al.*, 2019).

The connection between physical health and mental well-being is especially significant for older adults, underscoring the importance of addressing their mental health needs (Kadariya, *et al.*, 2019b).

Given the efforts to extend life expectancy, prioritizing the sound mental health and overall well-being of older individuals becomes paramount. Addressing the mental health needs of this growing demographic is essential to ensure a fulfilling and dignified quality of life during their later years (Xiong, *et al.*, 2021).

Despite varying experiences and age-related circumstances, individuals employ similar techniques to adapt and maintain their biopsychosocial health. Research has shown positive correlations between a high quality of life in old age and strong social and psychological health, which can mitigate the effects of declining biological health (Aw, *et al.*, 2019).

Emphasizing these health aspects early in life can build adaptive capacity and psychological reserves to cope with inevitable declines in physical health. Health, therefore, can be viewed as a dynamic and multifaceted concept, where strengths in one health-related area can compensate for deficits in another, enabling individuals to “bounce back” in the face of challenges (Aw, *et al.*, 2020).

Ageing often leads to deteriorating physical function and increased chronic health issues, affecting well-being, quality of life, and self-satisfaction. However, studies indicate that physically active older individuals are more likely to maintain healthy functioning, despite some age-related declines that may be unavoidable (Joseph & Ramakrishnan, 2021).

Recent research suggests that both hedonic and eudaimonic well-being are associated with better health profiles, indicating that impairments in well-being and quality of life may pose risks to the mental and physical health of older people (Nordmyr, *et al.*, 2020). Thus, the present pilot study aimed to identify the impact of intervention on the psychophysiological well-being of older adults.

Method

Sample

30 elderly participants (21 males and 9 females), aged 60 to 70 years, were selected from old age homes by random sampling technique. Only those participants, who had the ability to understand Tamil and English, as well as the ability to walk, and could stand, and move both upper and lower limbs without support. Older adults with psychiatric or systemic illnesses, visual or hearing impairments, or those who had undergone surgeries were also excluded.

Tools used

Modified Psychophysiological Wellbeing scale, which was originally developed by the McKinley Health Centre at the University of Illinois Urbana-Champaign (2000). It's a four-point Likert scale consisting of three sub-scales : Physiological well-being, Psychological well-being, and Social well-being, with each sub-scale containing 10 items, making a total of 30 items. The score interpretation categorized the well-being into different levels, ranging from "Outstanding" to "Very poor."

A questionnaire was also used to collect demographic information about the subjects.

Procedure

The respondents were divided into two groups: the experimental group (N=15, males 9, and females 6), and the control group (N=15, males 12, and females 3). For a pre-test assessment of Psychophysiological Wellbeing, the Modified Psychophysiological Wellbeing scale (developed by the McKinley Health Centre at the University of Illinois Urbana-Champaign, 2000), was administered on both the experimental and control groups.

The participants in the experimental group received an intervention comprising exercises, counseling, and reminiscence therapy. The intervention group sessions were for one-hour over a period of four weeks. The exercises were conducted twice a week for 30 minute each, both in the morning and evening. Counseling sessions were held once a week for 45 minutes to an hour, and reminiscence therapy was administered once a week for 60 minutes.

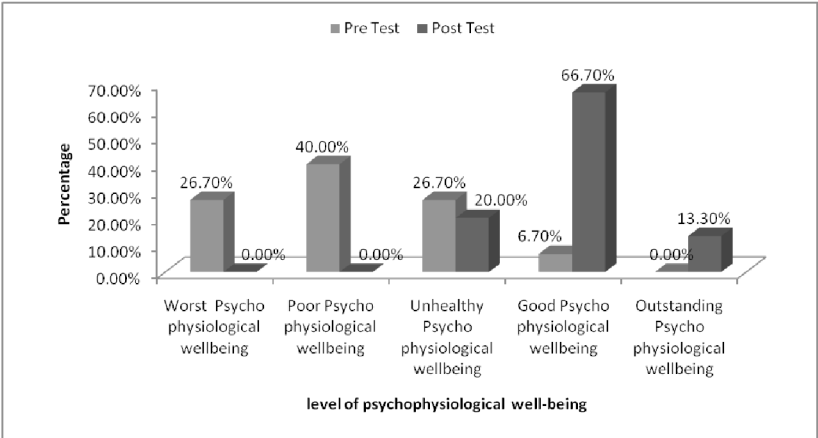
The control group received routine care provided by the personnel in the old age home. At the end of the 4-week intervention period, post-test assessments were conducted using the same Modified Psychophysiological Wellbeing scale for both the experimental and control groups.

The researcher demonstrated and supervised this intervention.

Before the study informed consent was obtained from all participants after providing them with adequate information. Permission from the Department of Social Welfare, Salem district was sought before the study. The study was approved by the IEC and was conducted from August 2022 to September 2022

Results

Figure 1. Showing the level of Psychophysiological well-being during pre-test and post-test in Experimental Group (N=30)



Bar diagram is based on the percentage distribution of respondents

Fig. 1 shows that the level of well-being in the experimental group during the pre-test was that of older adults: 26.70 per cent had very poor well-being, 40per centhad poor well-being, 26.70per cent had unhealthy well-being, and 6.70per cent had good well-being; none had outstanding well-being. During the post-test, older adults with none had very poor or poor well-being, 20per cent had unhealthy well-being, 66.70per cent had good well-being, and 13.30per cent had outstanding well-being.

These results demonstrate that after the intervention, psychophysiological well-being in the experimental group significantly improved.

Table 1

Comparison of pre-test post-test mean score of psychophysiological well-being among older adults between experimental group and control group.

N=30

Dimension of well-being	Assessment	Experiment group (n=15)		Control group (n=15)		Mean difference	Unpaired 't' value & P value
		Mean	SD	Mean	SD		
Physiological well-being	Pre-test	22.87	4.58	22.40	6.08	0.47	0.237 0.814 NS
	Post-test	31.13	2.503	25.60	4.925	5.53	3.879 0.001* S
Psychological well-being	Pre-test	24.47	5.167	23.70	4.535	0.77	0.924 0.364 NS
	Post-test	32.8	1.897	28.93	5.003	3.87	6.729 0.000*S
Social well-being	Pre-test	23.87	8.105	21.97	7.141	1.9	1.487 0.148NS
	Post-test	31.33	3.904	26.53	6.745	4.8	5.55 0.000* S
Overall (psychophysiological) well-being.	Pre-test	71.07	13.962	67.57	13.541	3.5	1.442 0.16 NS
	Post-test	95.27	6.734	83.90	15.219	11.37	4.623 0.000* S

NS-not significant, *S-Significant at P=0.05

Table 1 shows that in the Pre-intervention (Pre-test), there were no significant well-being differences between the experimental and control groups. In the Post-intervention (Post-test), the experimental group showed significantly higher well-being scores on all dimensions compared to the control group. This indicates that the intervention

positively impacted all dimensions of well-being in the experimental group compared to the control group.

Table 2

Comparison of pre-test post-test mean score of psychophysiological well-being among older adults within experimental group and control group.

N=30

Dimension of well-being	Assessment	Pre-test		Post-test		Mean difference	paired 't' value & P value
		Mean	SD	Mean	SD		
Physiological well-being	Experiment group (n=15)	22.87	4.58	31.13	2.506	8.26	10.163 0.000 *S
	Control group (n=15)	22.40	6.08	25.60	4.925	3.2	5.53 0.06 NS
Psychological well-being	Experiment group (n=15)	24.47	5.167	32.8	1.897	8.33	6.98 0.000*S
	Control group (n=15)	23.7	4.535	28.93	5.003	5.23	3.01 0.09 NS
Social well-being	Experiment group (n=15)	23.87	8.105	31.33	3.904	7.46	5.627 0.000*S
	Control group (n=15)	21.97	7.141	26.53	6.745	4.56	3.08 0.08 NS
Overall (psychophysiological) well-being	Experiment group (n=15)	71.07	13.962	95.27	6.734	24.20	10.304 0.000*S
	Control group (n=15)	67.57	13.541	83.90	15.29	16.33	4.68 0.07 NS

NS-not significant, *S-Significant at P=0.05

Table 2 highlights that in the Experimental group; there was significantly improved well-being from the pre-test to the post-test, indicating a positive intervention effect. And in the Control group, there was no significant change in well-being from the pre-test to the post-test, suggesting no intervention effect.

Table 3

Comparison of post-test means score psychophysiological well-being among older adults between the experimental and control groups

N=30

Dimension of well-being	Experimental group (n =15)		Control group (n=15)		“t” Value	P Value
	Mean	SD	Mean	SD		
Physiological well-being	31.13	2.503	25.60	4.925	3.879	0.001*(S)
Psychological well-being	32.80	1.897	25.07	4.026	6.729	0.000*(S)
Social well-being	31.33	3.904	21.73	5.444	5.55	0.000*(S)
Overall (Psycho-physiological) well-being	95.27	6.734	67.33	22.411	4.623	0.000*(S)

*S-Significant at P=0.05

Table 3 shows that significant differences existed between the experimental group and the control group across all dimensions of well-being, with the experimental group achieving higher mean scores. These findings indicate that the intervention applied to the experimental group had a positive effect on all dimensions of well-being compared to the control group.

Discussion

“The results of this study showed that older adult participants demonstrated improved physiological well-being, psychological

well-being, social well-being, and overall well-being after the intervention (which included exercises, counselling, and reminiscence therapy). The current study's findings were supported by the following research:

Baez, *et al.*, (2017) conducted a study to evaluate the impact of online group exercises for older adults on physical, psychological, and social well-being. After an eight-week training program, they observed improvements in physical outcomes and adherence levels. Additionally, they identified that online social interactions were correlated with a decrease in loneliness among older adults in social groups (Alphonsa, *et al.*, 2018).

Relaxation therapy was shown to be effective in improving psychological well-being among elderly individuals residing in old-age homes (Tam, *et. al.*, 2021)

A study by Henkel, *et al.*, (2017) found that residents engaged in reminiscence activities, both alone and with others, showed a preference for solitary reminiscing. They also identified that reminiscing with family members was common and cherished, while reminiscing with fellow residents was less frequent. Few of them expressed a desire for more opportunities to share their memories with healthcare providers, indicating the potential importance of these encounters (Ibid).

In addition, a systematic review and meta-analysis by Iwano, *et al.*, (2022) found that psychological interventions for well-being in healthy older adults had a large effect in size (Hedges' $g = 0.87$) and heterogeneity among the studies ($I^2 = 94.4$ per cent, $\tau^2 = 0.556$, $p = 0.00$). Five types of interventions were identified: an isolation prevention program, outdoor activities, art therapy through participating in theatre workshops, animal-assisted activity, and an encounter group. It also stressed that older adults' psychological well-being could be promoted through interventions that involve interaction with other people (Ibid)

A report by Syed Elias, *et. al.*, (2015) demonstrated the positive effects of exercises, counselling, and reminiscence therapy on the well-being of older adults. These interventions have been consistently

associated with improvements in physiological, psychological, and social aspects of well-being. The current study's findings further add to the existing body of evidence, emphasizing the effectiveness of these interventions in enhancing the overall psychophysiological well-being of older adults (Ibid)

Conclusion

This study has provided valuable insights into the feasibility and practicality of implementing interventions aimed at enhancing the psychophysiological well-being of older adults residing in old-age homes. Several key findings emphasize the viability of such interventions in this context.

First and foremost, the study successfully implemented a comprehensive intervention comprising exercises, counselling, and reminiscence therapy, demonstrating that it can be feasibly carried out in the setting of old-age homes. The structured approach, including group sessions and regular follow-ups, ensured that the interventions were delivered effectively and consistently to the participants.

The questionnaire used in this study demonstrated practicability and usability in assessing the psychophysiological well-being of older adults in old-age homes. Its structured design, relevance to the study population, use of validated scales, and considerations for language and cultural diversity all contributed to its effectiveness in collecting meaningful data for the research. These qualities enhance its potential for use in future studies targeting similar populations and research goals. These findings provide valuable insights for policymakers, healthcare providers, and researchers interested in enhancing the lives of older adults in residential care facilities.

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A Tamil Adaptation of the PWB Questionnaire for Older People

*Nagaraj, M. and Nithyanandan, D.V. **

Department of Psychology, Thiagarajar College, Madurai-625009

*Department of Psychology, Periyar University, Salem-636011

ABSTRACT

The present study aimed to translate and establish the psychometric properties of Sudha Bhogle and Indira Jai Prakash's Psychological Well-Being(PWB) questionnaire into Tamil. 213 older people (91 males and 122 females) aged 60 years and above living in Tamil Nadu were selected for this study. Tamil-translated Bhogle, S., and Prakash Indera, J., 's Psychological Well-Being questionnaire (1995) was individually administered to the respondents of this study. Mean, alpha coefficient, temporal stability, and factorial structure were calculated from the data. It was found that the average mean score of psychological well-being was 20.76 for older men and 21.14 for older women and these differences were identified as statistically significant. The translated tool had an acceptable content validity and the alpha coefficient was 0.90. The scores analyzed by the principal component method with varimax

rotation delivered twelve factors with an Eigen value greater than one. The twelve factors were labeled as Meaninglessness, Somatic symptoms, Self-esteem, Positive affect, Daily activities, Life satisfaction, Suicidal ideas, Personal control, Social support, Tension, Wellness, and General efficiency. It was concluded that the Tamil version of the Psychological Well-Being questionnaire would be useful to evaluate psychological well-being among Tamil-speaking older people and the version was reliable with previous studies carried out on the other versions.

Keywords : Psychological Well-Being questionnaire, Tamil Translation, Psychometric Properties, Older people.

Psychological well-being is a vital aspect of human life. The theoretical framework of psychological well-being includes positive thinking, self-acceptance, and positive relationships with others, environmental mastery, self-esteem, a person's self-perceived function, autonomy, purpose in life, personal growth, and optimism (Shapiro, *et al.*, 2005). According to Ryff (1989), Psychological well-being refers to the degree to which people feel that they have significant control over their life and their actions. Also, it explains the proper functioning of the psychological system because positive functions encompass the six dimensions of psychological well-being namely self-acceptance, positive relations with others, personal growth, purpose in life, environmental mastery, and autonomy. Each dimension contributes to mental health.

Classical studies found that younger people and people with high incomes were happier than people who do not have such status (Bradburn, 1969; Andrews & Withey, 1976; Campbell, *et al.*, 1976). Later, the studies found that demographic variables manipulate part of happiness in individuals (Diener, 1984; Ryff, 1989). Recent studies

recommend that well-being may even develop with age (Carstensen, 1995). Lawton (1996) indicated that social indicators do not look to be satisfactory to account for the differences in the well-being of older people.

In general, older people have lower psychological well-being than others do if they lose their life partners, relatives, neighbors, and friends. Later, they have to face various common struggles like loneliness, financial insecurity, physical helplessness, lower social support, poor health, etc., which directly affect the well-being of older people.

Some of the reviews that explain older people's psychological well-being like Chamuah and Sankar (2017) revealed that older males enjoyed a more successful and happy life than older females, showcasing a high psychological well-being. Heydari, *et al.*, (2012) identified that older people living at homes with enhanced lifestyles like good residency, marital status, and education were found to have high psychological well-being.

Patel (2003) assessed the relationship between living arrangements and the psychological well-being of institutionalized older people. The study found that institutionalized older people felt lower psychological well-being than non-institutionalized older people. Life events were also found to be the predominant factors for defining older people's well-being (Ramamurthi & Jamuna, 1984; Smallegan, 1989; Ramamurthi, 1991; Ramamurthi & Jamuna, 1992; Schulz & Williamson, 1993; Rozzine, *et al.*, 1996).

To measure psychological well-being, a comprehensive review revealed, that measuring tools, namely, the Psychological General Wellbeing Index (Dupuy, 1990); General Health Questionnaire (Goldberg, 1985); Subjective Well-being (Nagpal & Sell, 1985); Psychological Wellbeing Scale (Ryff, 1989); PGI General Wellbeing (Verma & Verma, 1989); and Psychological Well-Being Questionnaire (Bhogle & Prakash, 1995) are popularly used in the Indian context. Among these, the psychological well-being

questionnaire of Bhogle and Prakash (1995) is one of the accustomed tools to assess well-being. Hence, this study is undertaken to adapt it to the needs of the research on Tamil-speaking elderly.

Tool Description

The Psychological Well-Being (PWB) questionnaire was introduced by Sudha Bhogle and Indira Jai Prakash (1995) as a self-reporting scale consisting of 28 items with 12 dimensions, namely, Meaninglessness, Somatic symptoms, Self-esteem, Positive affect, Daily activities, Life satisfaction, Suicidal ideas, Personal control, Social support, Tension, Wellness, and General efficiency. The questionnaire has positive and negative items where every 'Yes' response is awarded a '1' score and 'No' response a '0' score for positive items and every 'No' response a '1' score, and 'Yes' response a '0' score for negative items. The reported internal consistency coefficient of this scale was 0.84 and the split-half coefficient was 0.91. The 'r' for subjective well-being was 0.62 and the 'r' for general well-being was 0.48. The scale has been used in some studies among the Tamil-speaking population (Sujatha & Jayakumar, 2017).

Though the scale was developed for the Indian population which is linguistically very diverse, a measurement will be more valid if it is in one's comfortable and day-to-day language, usually the person's mother tongue. Further, Maneesriwongul and Dixon (2004) stated that International and cross-cultural studies in the field of psychology regulate the possibility of translation and cross-language validation of psychological instruments. Therefore, it is mandatory to translate the research instruments into the native language of the culture being studied. Jamadin and Noordin (2018) labeled the techniques and process of scale translation by explaining the issues that were found during the development of translation. As suggested by numerous bilingual and bicultural experts, multiple combinations of a few approaches are used to translate the quantitative research instruments (Mallinckrodt, and Wang, 2004).

Many psychological well-being scales have been translated and tested into different languages such as Ryff's scales in Spanish (Freire, *et al.*, 2017), Serbian (Nisevic & Cigic, 2013), Korean (Choi & Choi, 2016), Chinese and Taiwanese (Li, 2014) as well as in other English-speaking cultures, such as the U.S.A (Hsu, *et al.*, 2017) and Australia (Burns & Machin, 2009). Further, Diener's Psychological Wellbeing Scale (PWS, 1984) was also previously translated and validated into Norwegian, Portuguese, and Urdu languages (Bartone, *et al.*, 2012; Spagnoli, *et al.*, 2012; Khan, & Batool, 2020). However, this is the first such attempt at translation in the Tamil language.

Tamil is one of the active classical world languages spoken as an official language in India, Singapore, Malaysia, and Srilanka and approximately 8 Crore people speak it across the world (Kunantakami, 2005). Hence, the present study aimed to translate and assess the psychometric properties of the Tamil version of the Psychological Well-Being (PWB) questionnaire among Tamil-speaking older people

Objectives

1. To translate the Psychological Well-Being (PWB) Questionnaire into the Tamil language
2. To determine the cross-language validity of the Tamil translated scale.
3. To establish the psychometric properties and confirm the factor structure of the Tamil translated scale.
4. To compare the psychological wellbeing of older people by age, sex, locality, and family type.

Sample

The sample of this study consisted of 213 older people (91 males, and 122 females) and the age ranged from 60 years to 90 years. The sample was collected from various districts of

Tamilnadu from different settings such as old-age homes, people who live with family members, retirement associations, and walkers associations.

Procedure

The translation and establishment of psychometric properties of the psychological well-being (PWB) questionnaire proceeded in multiple stages. The first step was to translate the questionnaire by using the standard procedure. The second step was to assess the validity of the translated questionnaire and the final step was to assess the reliability followed by the pilot study.

Part I - Translation Procedure

The Psychological Well-Being questionnaire was translated into Tamil by using the standard procedure consisting of the forward translation, the consensus version, the backward translation, and the expert committee feedback. After getting permission from the concerned author of the questionnaire the translation procedure was followed and reviewed by an expert committee of psychologists working in both Tamil and English. Figure 1 shows the Steps for Translation (Nagaraj & Nithyanandan, 2019).

- **Forward Translation:** For the forward translation, two bilingual experts who are also native Tamil speakers individually translated the English version of the PWB questionnaire to Tamil. Later, it was consolidated into one consensus version. Further, it was organized by the expert committee who were psychologists and language experts.
- **Backward Translation:** Two professors well-versed in English translated the Tamil version of the PWB questionnaire into the English version not being aware of the original version of the PWB questionnaire during the process of translation.

- **Expert Committee:** The panel of the expert committee reviewed all three translated versions (Tamil version, Consensus version, and English version). After the committee meeting, they made a new pre-final version of the PWB questionnaire, the Tamil version. Further, it was taken for the expert opinion to assess content validity.

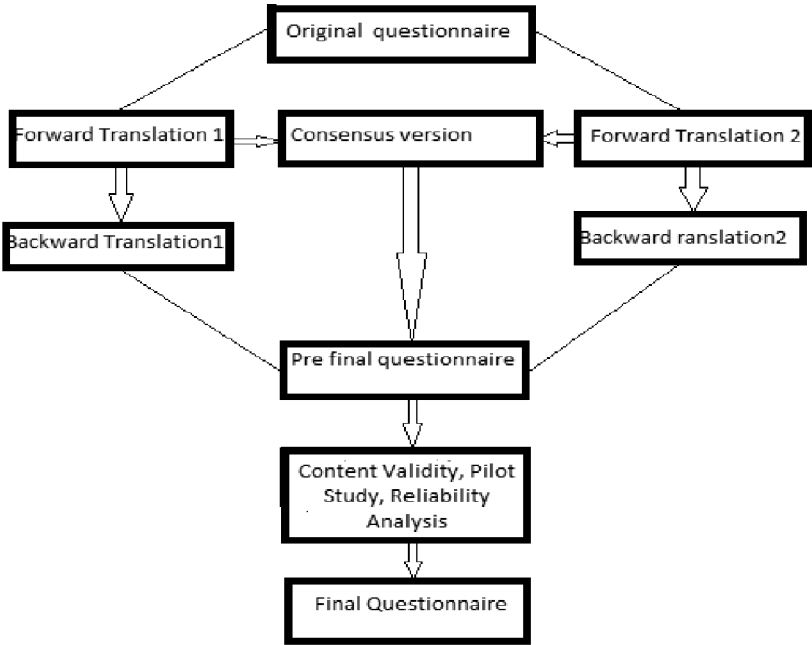


Figure 1. Steps for Translation; Adapted from “Psychometric properties of the Tamil version of Templer’s death anxiety scale” Nagaraj.M and Nithyanandan. D. V, 2019, Research Journal of Social Sciences,10(6), p. 580-587.

Part II - Validity

In the validity part, multiple health professionals who were involved in the field of psychology and gerontology were included

namely, one clinical psychologist, three psychologists, two psychiatrists, one neurologist, one social worker, and one geriatrician. They reviewed the content, usability for older people, practical usage, efficiency of Tamil, and simplicity of administration of the translated Tamil version questionnaire

Part III - Pilot study

Having established the content validity, the tool was taken into the pilot study conducted at different old age institutions and non-institutions (Walker's Association & Retirement Association) in Tamil Nadu. Before the pilot study, consent has been obtained from the head of the Institutions and outside the associations. After giving proper explanations to the older population the data were collected and analyzed. Finally, a total of 213 older people participated in the pilot study.

Part IV – Reliability

The Cronbach alpha was found to be 0.90 for the PWB questionnaire. The questionnaire was administered again eight weeks later (Time 2) on a sample of 76 older people of the 213 original samples. The rationale behind the retest was to know the temporal stability of the questionnaire and the result was found to be 0.83. The result revealed that the tool had good internal consistency and it was found to be effective in conducting the main study in the selected sample (Table 1)

Table 1
Reliability Analysis

Reliability	Cronbach's alpha
Total Items (PWB)	0.90
Test-retest	0.83

It can be seen from Table 2 that the factor was loaded twelve-factor structure which has been acknowledged as 79.03 per cent of the total variance. In this translation study the varimax rotation indicated that (a) five items loaded on the first component explaining 32.45per cent of the variance; (b) four items loaded on the second component with 10.37per cent of the variance; (c) four items loaded on the third component with 5.47per cent of the variance; (d) three item loaded on the fourth component with 4.64per cent of the variance; (e) every two items were loaded respectively on the fifth, sixth, seventh, and eighth component with 4.42per cent, 3.79per cent, 3.59per cent, and 3.37per cent of the variance; (f) each one item was loaded respectively on the ninth, tenth, eleventh and twelfth component with 3.10per cent, 2.74per cent, 2.49per cent, and 2.36per cent of the variance.

Table 3

Comparison of psychological well-being by age, sex, locality, and family type

Demographic Variables	Subgroups	N=213	%	M	SD	t/F
Age	60 -69	96	44.9	20.11	6.55	2.11 ^{NS}
	70 -79	95	44.4	21.91	5.18	
	80 - 90	22	10.7	20.73	7.15	
Sex	Men	91	42.5	20.76	6.24	0.45 ^{NS}
	Women	122	57.5	21.14	5.97	
Locality	Rural	66	31.0	19.18	6.66	2.93*
	Urban	147	69.0	21.78	5.63	
Family Type	Joint Family	84	39.4	20.99	6.41	0.41 ^{NS}
	Nuclear Family	122	57.5	20.85	6.00	
	Extended Family	7	3.1	23.00	2.16	

Note. * $p < .05$; NS = Not Significant

Table 3 shows the comparison of older people in terms of their age, sex, locality, and family type. The twenty-eight items administered

on the same older population were used for tool translation (60 years to 90 years). A total of 213 older people had participated and most of them were older women ($N=122$). The mean age of 60 to 69 years was 20.11 ($SD=6.55$) and 70 to 79 years was 21.91 ($SD=5.18$) and only 10 per cent of them were above 80 to 90 years of age.

The gender did not show any significant differences. But the older women participants had a higher mean score of psychological well-being than older men. It was found that 21.14 ($SD=5.97$) for women and 20.76 ($SD=6.24$) for men. Further, locality shows the significant differences between rural and urban ($t=2.93$) areas. Older people from urban areas ($M=21.78$, $SD=5.63$) reported a significantly higher total mean score on psychological well-being than older people from rural areas ($M=19.18$, $SD=6.66$). In addition, the older people from the nuclear family system ($M=20.85$, $SD=6.00$) had less psychological well-being than the other two groups.

Discussion

The objective of this study was to translate and validate the PSW questionnaire, because it is relatively harder to answer questions in English than in Tamil; even for literate population Tamil is more understandable and the way of communication for Tamil speaking people, hence, for the ease of participants of future researchers, and to avoid any misconception, this questionnaire was translated into Tamil language and the psychometric properties of the questionnaire were established. The reliability was measured by Cronbach's alpha and content validity by multiple health professionals in the field of psychology and gerontology. The results of the reliability analyses showed the positive significant results with sound psychometric properties (see Table 1). To explain the factor structure of the Tamil translated versions of the questionnaire, the explanatory factors analysis (EFA) of principal component analysis with varimax rotation was carried out (see Table 2). Here the researcher did not reduce any items from the original questionnaire,

because the main objective of this study is to translate and validate the complete questionnaire. Furthermore, the final objective of this research is to assess the comparison of the psychological wellbeing of older people by age, sex, locality, and family type. Here, the locality, alone, was found to have significant differences than all other groups (see Table 3). Finally, the above discussion explains the Tamil version of the PWB questionnaire is a valid measure of psychological well-being.

Limitations and Recommendations of the Study

There are a few limitations observed in this study. First, the psychometric properties of the questionnaire were assessed only for the Tamil-speaking older population, and for that reason, the generalization of the present study is acceptable only for similar groups. Second, there was no other accessibility of psychological well-being questionnaires in the Tamil version to assess the concurrent validity. Finally, this is the first questionnaire translated into Tamil version and therefore many studies are needed for strong generalizability.

Conclusion

Based on the translation, administration, and analysis of the Tamil version of Sudha Bhogle and Indira Jai Prakash's PWB questionnaire on the older population of Tamil-speaking participants, it can be concluded that the psychometric properties of the questionnaire are acceptable with adequate satisfactory reliability and content validity which are consistent with the original questionnaire.

Hence, it can be further concluded that the tool will be an effective one in research efforts among the older population and it can be used for various types of gerontological research.

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Assessment of Cognition in Indian Senior Citizens Using the Marathi Montreal Cognitive Assessment Scale (MOCA)

*Samruddhi Murkey, Nupoor Kulkarni, Deepali Hande, and
Aditi Khot*

Dr. APJ Abdul Kalam College of Physiotherapy,
Pravara Institute of Medical Sciences, Loni, Taluka Rahata,
Ahmednagar-413736 (M.S.)

ABSTRACT

Alzheimer's disease (AD) is the most common form of dementia, representing an increasing challenge to public health and the healthcare system, and having a tremendous impact at both the individual and the societal levels. The purpose of this study was the assessment of cognition of 220 community-dwelling elderly individuals aged 60 years and above, who volunteered for the study. The Marathi Version of the Montreal Cognitive Assessment Scale (MOCA) was used for cognitive assessment. The findings revealed that 134 individuals (61.4%) Scored less than the cut-off score of 26 on the MOCA Test suggesting that mild cognitive impairment needs for further assessment to diagnose the risk for Alzheimer's disease (AD).

Keywords : Montreal Cognitive Assessment Scale, MOCA, Cognition, Indian Older Adults.

The population of older adults worldwide is growing, and the prevalence of age-related health problems is becoming an important public health issue (Kulkarni, *et al.*, 2017). Ageing is a natural phenomenon characterized by loss of neurons and decrements in neurotransmitter release and physiological function. Cognition is the process of acquiring knowledge. It includes reasoning, memory, awareness, judgment, and intuition. The ageing process is accompanied by the deterioration of cognitive functions such as memory, attention, reaction time, and speed of information processing. The neurotransmitter systems play an important role in the process of cognition, and deterioration of the transmitter systems causes cognitive decrement in ageing. (Ozkaya, *et al.*, 2007)

Mild cognitive impairment (MCI) is an intermediate clinical state between normal cognitive ageing and dementia. MCI has a high risk of progressing to dementia among older adults. (Nara, *et al.*, 2018) Dementia and other cognitive problems are the most commonly found problems among the elderly (Kulkarni, *et al.*, 2017). Alzheimer's disease (AD) is the most common form of dementia, representing an increasing challenge to public health and the health care system, and having a tremendous impact at both the individual and the societal levels (Ibid). Life expectancy at older ages has been increasing, and the number of older persons has been growing rapidly. Understanding the demands for personal care and support as well as medical care posed by an aging population requires estimating demands related to declines in both the cognitive and physical health of older persons (Malek-Ahmadi, *et al.*, 2015). Among the elderly population, AD is strongly associated with functional disability and institutionalization leading to a decreased quality of life. At the individual level, AD significantly shortens life expectancy (Kulkarni, *et al.*, 2017). Hence, it is important to have reliable estimates of the prevalence of cognitive impairments in the elderly as this may help in accurate revision for planning and optimal care management of elderly individuals affected by cognitive impairment (Crimmins, *et al.*, 2011). Detecting Cognitive Impairment is important because it allows affected individuals to receive additional support, early

intervention, and close monitoring. There are a number of assessment scales available to assess cognition in older adults but very few of them cover this broad range of use (Kulkarni, *et al.*, 2017). In addition, some scales have a cost attached to them which hinders their use in clinical practice (Ibid). The widely used assessment tools are the Mini-Mental State Examination (MMSE), Abbreviated Mental Test Score (AMTS), 6-item Cognitive Impairment Test (6CIT), Minicog, General Practitioner Assessment of Cognition (GPCOG), Montreal Cognitive Assessment Scale (MoCA), Addenbrookes Cognitive Examination-III (ACE) and Test Your Memory (TYM) test (Ibid).

To facilitate the detection of Mild Cognitive Impairment, many health professionals around the world are using the Montreal Cognitive Assessment (MoCA) because it has been well-accepted as a sensitive and efficient screening tool (Julayanont, *et al.*, 2015). The Montreal Cognitive Assessment (MoCA) is a brief cognitive screening tool that has demonstrated good diagnostic accuracy in identifying amnesic Mild Cognitive Impairment (aMCI) as well as dementias such as (AD) Alzheimer's disease (Malek-Ahmadi, *et al.*, 2015). Taken together, these studies support the notion that normal performance on the MoCA is relatively wide and that scores below 26 are quite common among cognitively normal older adults. Hence, our study aimed to assess the cognition in Indian Senior Citizens, in order to assess the risk and establish an initial profile for the dementia disease, via the MOCA test.

Method

Sample

In this cross-sectional observational study 220 community-dwelling literate elderly individuals with age >60 years volunteered for the study were selected. Participants were excluded if they had a history of stroke, transient ischemic attack, dementia, or other neurological conditions that could affect their performance.

Tools Used

The Marathi Version of the Montreal Cognitive Assessment Scale (MOCA) was used for cognitive assessment. The Marathi

Montreal Cognitive Assessment Scale (MOCA) is a series of 8 tasks on a single side of a sheet with spaces for the participants to fill in. The tasks are Visuospatial / Executive (5 Points), Naming (3 Points), Memory (No Point), Attention (6 Points), Language (3 Points), Abstraction (2 Points), Delayed Recall (5 Points), Orientation (6 Points). Add 1 point if d" 12 years of education in total, giving a possible total of 30 Points. The scores for the subsets are printed on the card and the total score is calculated by adding the subset scores as per the scoring instructions.

MoCA is relatively broad and scores below 26 are quite common among cognitively normal older adults, a score of 26 or above is considered normal.

To collect basic demographic information a questionnaire was used. The demographic data of the sample are presented in Table 1.

Table 1

Demographic Variables		N (220)	%
Gender	Male	113	51.8
	Female	107	48.6
Education	Below 12 th Class	115	52.7
	12 th Class and Above	105	47.7

The study was conducted in Dr. A.P.J. Abdul Kalam College of Physiotherapy Loni, Maharashtra. The study received approval from the Institutional Ethics Committee of the Dr. A.P.J. Abdul Kalam College of Physiotherapy.

Stepwise analysis of every component was performed of MOCA test, present in Table 2.

Table 2

Component	Scoring	
Visuospatial	0 (Less)	1(High)
N	24	196
%	11%	89%

There are total 9 Components, Table 2a represents the Visuospatial Component in which 11 per cent is affected and 89 per cent is having normal Visuospatial Component.

According to the results, 134 individuals (61.4%) Score less than the cut off score 26 on MOCA Test suggesting the need for further assessment to diagnose AD.

Table 2b

Component	Scoring	
	0 (Less)	1 (High)
N	88	132
%	40.3%	60%

Table 2b represents the Executive Component, in which 40.3 per cent of participants executive is affected and 60% of participants are normal.

Table 2c

Component	Scoring			
	0	1	2	3
N (220)	13	27	18	162
%	5.9%	12.3%	8.1%	74.3%

Table 2c represents the Draw Clock Component, in which 5.9 per cent of the participants were unable to draw a clock, 12.3 per cent of the participants were able to counter the clock, 8.1 per cent of participants were able to counter and give numbers to the clock and 74.3 per cent of Participants was able to counter, numbers and draw the hands of the watch.

Table 2d

Component	Scoring			
	0	1	2	3
N (220)	0	3	34	183
%	0	1.3%	15.5%	83.2%

Table 2d represents the Naming Component, in which 1.3 per cent of Participants were able to name only 1 animal, 15.5 per cent of participants were able to name 2 animals and 83.2 per cent of Participants were able to name all 3 animals.

Table 2e

Component				Scoring			
Attention	0	1	2	3	4	5	6
N (220)	7	9	16	28	33	37	90
%	3.2%	4.1%	7.3%	12.8%	15.1%	16.9%	40.9%

Table 2e represents the Attention Component, in which there are three subcomponents (Read list of digits (1digit/s), Read List of Letters, Serial 7 subtraction starting at 100); according to which scoring was done.

Table 2f

Component	Scoring			
Language	0	1	2	3
N (220)	19	58	95	48
%	8.7%	26.6%	43.5%	21.8%

Table 2f represents the Language Component, in which there are 2 subcomponents (Repeat the sentence and Fluency/number of word); according to which Scoring was done.

Table 2g

Component	Scoring		
Abstraction	0	1	2
N (220)	94	56	70
%	43.1%	25.4%	32.1%

Table 2g represents the Abstraction Component, in this person wants to know the similarity between of 2 subcomponents. 43.1 per cent of participants were not able to perform the Abstraction, 25.4

per cent of participants were able to perform 1 abstraction and 32.1 per cent of participants were able to perform both the subcomponents of Abstraction.

Table 2h

Component	Scoring					
Delayed Recall	0	1	2	3	4	5
N (220)	1	14	59	61	19	66
%	0.45%	6.42%	27%	27.9%	8.6%	30.3%

Table 2h represents Delayed Recall Component, in which Participants have to recall 5 words with no cue. According to which scoring was done.

Table 2i

Component	Scoring					
Orientation	1	2	3	4	5	6
N (220)	0	0	0	0	0	220
%	0	0	0	0	0	100%

Table 2i represents the Orientation Component, in which scoring is done according to the orientation of Date, Month, Year, Day, Place, and City.

Discussion

The aim of the study was to assess the cognition of Indian senior citizens residing in Maharashtra using the Marathi Montreal Cognitive Assessment Scale (MOCA).

Incidence surveys are useful because they allow health workers and planners to know the burden of disease in a community (Jer Lim, *et al.*, 2003). In this study of 220 Indian Citizens assessment with the help of the MOCA test showed that 61.4 percent of individual Scored less than the cut-off score of 26 on MOCA which suggest Cognitive Impairment. The strong association of AD with aging in this study may in part reflect the cumulative effect of various risks

and protective factors across the lifespan, including the effects of complex interactions of genetic susceptibility, psychosocial factors, biological factors, and environmental influences (Kulkarni, *et al.*, 2017).

Previous reviews have shown that in AD risk assessment, the effect of education was stronger in studies evaluating illiterate or low-educated individuals, studies, and in dementia prevalence studies (Sharp ES, *et al.*, 2011). The result of this study is in accordance with the study done by Emily Schoenhofen (Ibid), who stated the relationship between education and dementia was more consistently supported in developed countries than in developing regions of the world (Ibid). Another possible explanation in support of the results of the current study is low educational attainment in developing regions which may mainly reflect lifelong disadvantages such as poorer maternal health, poor nutrition, or exposure to infections compared to developed regions (Ibid). In addition, the proportion of people who are illiterate or have very low levels of education is often significantly higher in rural areas than in cities, this less educated sample may be at greater risk of developing dementia (Ibid). In another study done (Das, *et. al.*, 2007), it is possible that controlling environmental factors and improving reading skills may reduce the prevalence of cognitive dysfunction in aging individuals (Ibid). Age data for the elderly were often approximations based on events in the sentinel's life, as age could not be confirmed by birth certificates and may account for some variation in age-specific prevalence rates (Ibid). The higher prevalence of Mild cognitive impairment (MCI) in the present study could be due to the higher life expectancy of the Indian population which was similar to that of developed countries (Ibid).

Strengths of this research include the MOCA screening tool being culturally and linguistically appropriate, as well as locally developed and validated (Kulkarni, *et al.*, 2017). All elderly individuals in this study were community-dwelling (Ibid). The opportunity to interview relatives was offered if participants were not cognitively stable for any reason (Ibid)

The limitation of this study is that MOCA is not a diagnostic test. The diagnosis of AD or MCI needs to be made on clinical grounds. There could be many reasons for a poor MOCA score. The follow-up could not be done for the participants recruited at the time of screening; hence, the incidence was not calculated.

From this study, it may be concluded that 61.4 percent of older adults scored less than the cut-off value on the MOCA test suggesting Mild Cognitive Impairment. The study confirms that prevalence rates vary widely depending on the criteria used, which emphasizes the need for well-defined operational criteria in epidemiological studies. The results suggest that lower education is associated with an increased risk of dementia in some, but not all, studies.

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Life Course Standpoint of Ecological Prudent Practices : The Case of Kattunayakan Tribal Elderly in South India

*Aswathy V K, and Lekshmi V Nair**

Department of Sociology,

Lovely Professional University, Jalandhar, (Punjab)

*Indian Institute of Space Science and Technology,
Thiruvananthapuram, Kerala

ABSTRACT

This study seeks to understand how sensible subsistence practices centered on conservation affect each stage of life among the Kattunayakan community in Wayanad. The ideas and experiences of individuals regarding traditional conservation practices are complicated and varied, hence the ethnographic research methodologies were chosen for gathering the qualitative data. Because it is appropriate for cross-cultural work, where indigenous viewpoints are frequently incorporated into current literature, the grounded theory technique was used to interpret the interviews. The comparison of the life histories of the two generations revealed a shift between the great-grandparents' group and the grandparents' group from conservatism to profligacy. The influence of other socioeconomic and cultural groups was a major factor in this shifting tendency.

Keywords: Ecological Prudent Practices, Life Course Perspective, Kattunayakan Tribe

Conservation-based livelihood strategies have their roots in human history. Such an idea is based on practices and is related to the environment. In tribal cultures, rituals, ceremonies, and conventions are ingrained in daily life and are strongly tied to the environment. They are prohibited from engaging in any type of environmental degradation activities by long-standing socio-ecological-ethical conservation standards because they feel that protecting natural resources is crucial for their survival (World Bank, 2005). They depend on natural resources for survival. Historically, tribal societies, one of the classic forest-dependent groups, were nomadic hunters and gatherers who later developed into shifting cultivation practices and finally reached into settled agriculture activities. This is regarded as the tribal communities' temporary means of subsistence. This change in tone highlights how completely dependent humans are on their environment and its resources to survive. Their mode of subsistence has undergone certain adjustments as a result of social and structural developments.

The crucial intervention on the part of communities who depend on forests is the significance of using forest resources responsibly (Gadgil, 1992). Tribal societies have always taken a practical and preserving stance towards their environment. They have a history of sharing resources in large groups. The bulk of tribal societies, like Kattunayakans, prioritised food for survival. They have discovered that as the population grows, the environment becomes more fragile, and the pattern of livelihood changes to accommodate their needs. The older generation is prohibited from overconsumption of forest resources by traditionally observed social and religious standards on responsible resource management. According to them, the environment has a significant spiritual role in maintaining resource balance so that everyone can use it. The emotional ties that exist between family members, as well as with birds, animals, and trees, are a significant aspect of Kattunayakan culture. This emotional connection arose from the idea that humans and nature have a symbiotic relationship of mutual dependency. They act prudently

because they feel that if they don't save, there won't be enough resources for the next generation (Gadgli, 2000). Thus, even though they have lots of resources, the older generation exhibits restraint and little resource use. The younger generation's commercialized consumption pattern of forest resources makes clear the critical subsistence dependence on forests. As a result, a large population's overreliance on the forest leads to forest degradation and an imbalance in the ecological services.

The younger generation is changing the traditional wisdom that has been passed down from generation to generation on conservation-based consumption patterns. Dependence on commercial livelihood replaces livelihood based on conservation. Through an examination of elderly people's experiences throughout their lives, the current research seeks to understand the transitory variations of traditional conservation practices in this setting. Through this paper, the researcher tries to find out the conservation-based forest resource collection of aged people's generation. In recent years, as society undergoes a process of social change, changes have taken place in the responsible resource collection practices too. The study tried to portray this shift by analyzing the experiences of the aged and youth in the Kattunayakan tribal community in Kerala.

Objectives of the Study

1. To illustrate the ecologically responsible activities of Kattunayakan-aged people.
2. To explore the relationship between cultural practices and ecosystem services from the life-course experience of Kattunayakan-aged people
3. To evaluate the participatory paradigm for conserving ecosystem services

Methodology

The researcher adopted an inductive investigation technique that permitted an understanding of how evolving patterns of ecological

caution modify the occurrences in each stage of the respondents' lives, a qualitative approach (Merriam, 2002) was used for the current study. The current qualitative study examines the shift to ecological caution as a socio-cultural and ecological process via the lens of an ethnographic case study. This ethnography offers both theoretical generalizations between selected instances and in-depth analysis within individual cases. The present study uses in-depth face-to-face interviews with selected groups and with respondents' relatives, especially the youth as its data collection methods. The cases were specifically picked with the intention of examining the value of traditional communities' ecological caution in the current climate of ecological degradation. The thematic analysis has been done and the study arguments are also developed.

Study Locale

The present study was conducted in the Sulthan Bathery Municipal area. The researcher has chosen forest-enclosed Kattunayakan tribal settlements such as Kumizhi, Ponkuzhi, Aanappanthi, Chukkalikuni, Maalappady, and Pullumala. These settlements are covered by forest. As this locale is situated inside the forest area, their livelihood is largely depending upon forest and its resources. These tribal settlements are located inside Wayanad Wildlife Sanctuary. It is home to the majority of the Kattunayakan people from the Sulthan Bathery municipal area, who are completely dependent on the forest and its resources to survive. That is a requirement for choosing a location.

Case Selection- Inclusion Criteria

The researcher collected in-depth information from ten tribal-aged people from six Kattunayakan settlements. Interviews with five Kattunayakan youths have also been collected to substantiate the information. Chronological age is not significant in this ethnic group. The aged people were identified based on their relative ages. Ten elderly individuals from six Kattunayakan settlements who were

either grandparents or great-grandparents chosen as cases. Aged people who practice traditional methods of resource collection are selected for collecting qualitative information. Youth from this community are selected from the group who practice non-forestry livelihood activities.

Result and Discussion

Kattunayakan : A Particularly Vulnerable Tribal Group

Kattunayakans are considered the forest chiefs. The term kattunayakan came from two Malayalam words; *Kadu* meaning forest and *nayakan* meaning chief. Kattunayakan can be considered as one among the five particularly vulnerable tribal groups (PVTGs) in Kerala and one among the 75 PVTGs in India. In the Wayanad Wildlife Sanctuary, they can be divided into two groups: the Jenu Kuruba (those who mostly survive off honey) and the Mutsa Kuruba (those who inhabit the Grey Langur's habitat). They have only relied on the forest and the resources it provides for their survival. Traditionally, they were referred to as hunters and gatherers. Many more diverse subsistence activities took the place of their conventional subsistence pattern. Initially nomadic hunter-gatherers, their social structure later evolved into shifting cultivation, settled cultivation, and livelihood diversification.

Livelihood Practices of Kattunayakans

Kattunayakans are the experts in collecting wild honey from trees and rocks. They collect medicinal plants and roots as well. Traditionally they depend on the forest and its resources for their survival. There are no gender-specific livelihood practices that exist among this Kattunayakan people. Women are also actively participating in honey collection practices. The researchers observed, Kattunayakan women and men especially youth, are engaged in cattle rearing. The old age people collect medicinal plants and make various medicines. They sell the same to the nearby villagers. There is a change observed during the fieldwork in connection with livelihood practices.

Nowadays, they choose non-forestry works as a livelihood option. Mainly they work in the land of non-tribals. Some of them work with the Forest Department as night watchers and watchers to drive away wild elephants from human habitation.

Karikki, one of the old age lady from Kumizhi Kattunayakan settlement opined that;

“I spent my childhood days inside the caves and under the huge rock. During the night time, we stayed in a hole that my parents made to stay for women and children. When I was a child, we didn’t have a fixed address. We were relocated by our parents and grandparents. We built a makeshift shelter on top of trees and stayed in tiny caves. After gathering food resources, we moved on to another location. We never collected all resources.”

They have been evolving into a more diverse culture as settlers have poured in. Along with the hill-based worship pattern, they rigorously adhered to traditional practices including monogamy and endogamy. They frequently practiced ancestral worship as well as the veneration of sacred objects including species, groves, and natural settings. Some plants and animals were taboo, and the Kattunayakan community was doing prudently by not doing so.

Kullan, the great-grandfather in the tribal settlement of Ponkuzhi said;

“If we hurt any animal, our ancestors will punish us in the form of various ailments. We also consider them as our own family. We never inflict animal cruelty. If we discovered spotted deer that had been trapped and abandoned by carnivores, we used to devour it. If we destroy any flora or animals unnecessarily, our muthappan (God) will never forgive us.”

The unique characteristic that set the Kattunayakan tribe apart from other tribes was their healthy relationship with nature. The socioeconomic and cultural characteristics of Kattunayakans underwent major changes. From the non-commercial use of forest

resources to the commercial use of forest resources, there is a clear changing tendency.

Bommi, the resident of the Anapanthi colony said;

“My childhood days were enriched with wild fruits, tubers, and honey. Honey had an important place in our life at that time. My parents collected honey on the exact harvesting time. We had never traded natural resources for cash. But in order to cover their costs, our kids now require more money. In order to get money, they gather and sell the resources. They seek out more resources in order to increase their financial gain.”

This shifting trend of utilisation pattern is brought on by an expanding population, a consumerist society, and a lack of adequate revenue. The Kattunayakan tribe largely situated in the lush woods of southern India, has a strong connection to its environment, particularly when it comes to practices for gathering forest resources. They have relied on the forest as their main source of food and income for many generations. Their resource-collecting methods are not only environment friendly but also very considerate of the surroundings in which they live. The Kattunayakan tribe's extensive knowledge of the local flora and wildlife is one of the most noticeable features of their methods of collecting forest resources. They have a thorough awareness of the therapeutic benefits of many plants, which they apply to heal illnesses in their neighborhood. Their expertise is a crucial component of their healthcare system as well as a monument to their rich cultural past.

Jithu, a Kattunayakan youth from Aanappanthi settlement shared,

“I depend on the forest and its resources based on particular seasons. I am an autorickshaw driver. That's my main source of income. My wife is working as a primary school teacher also. My parents are entirely dependent on the forest resources and they follow traditional healing practices. We use modern

medicine. The use of modern medicine will cure all the diseases all of a sudden. But our medicine will take more time to cure.”

The Kattunayakan tribe also uses sustainable gathering methods to prevent the depletion of the forest’s resources. They gather natural resources from the forest, such as honey, nuts, fruits, and medicinal herbs, without endangering the ecosystem. In an era characterised by environmental concerns, the tribe’s peaceful coexistence with their surroundings serves as a testament to their dedication to protecting their natural legacy for coming generations and serves as an excellent model of sustainable resource management.

Ecologically Responsible Consumption Pattern of Kattunayakan Elderly

Historically, Kattunayakans would gather non-timber forest goods like fruits, tubers, medicinal herbs, and other items. They have a very strong cultural connection to nature. They protect plants in their native habitat, and this site is called Daivathara. Under the shade of the trees, they revere their ancestors at Daivathara. They are deeply influenced by rocks, trees, and even some creatures like wild boars and bison as well as plants like pumpkin. The people of Kattunayaka believe that their ancestors live in sacred locations and that they will punish anyone who harms their sacred items, plants, animals, or produce.

Kaalan, a great-grandfather from Chukkalikuni settlement said; “We consider animals as our siblings. They have the same rights as we have in the forest. Without the wildlife, we would not be alive. My grandfather has taught me the importance of sharing forest resources with wildlife. If we start any kind of cultivation practice, initially we have to offer something to our forefathers. My grandfather has given some edible things to the wildlife as well. In order to appease our ancestors, we first plant a pumpkin on our paddy field or place of agriculture. Only then would the impediments disappear from our farmland. We never take the whole edible resources such as mangoes, jackfruit, honey, or

any other things, completely. Because the wildlife deserves those edible things. If we share the resources, our ancestors won't punish us"

The sacred forest and its living creatures have been preserved in large part because of the customs and ceremonies of the Kattunayakans. Before taking anything from the forest, they made sure to ask their ancestors for permission. The elderly had long since practiced this rite. Youth rites and associated customary practices are beginning to disappear as the commercialization of forest resources is given priority. The great-grandparents have strong beliefs and adhere to the rites, rituals, and conventions associated with wise behaviour, whereas the grandparents do not have a strong beliefs.

Chikkan shared his thoughts on Maalappady settlement;

"In our locality, there were no human-wildlife conflicts in my childhood days. But now a day the situation changed. Because others are not giving any importance to ensuring the food security of the wildlife. How can we deplete our resources completely without leaving something behind for the next generation? If we do, our ancestors will undoubtedly punish us, and we risk developing serious health problems. But nowadays, our children use natural resources to make money as well. If we don't gather all the edibles, roots, and tubers, we won't be able to buy the things we need. The forest falls short of providing for our needs as our population continues to grow. We were approached by pharmacies willing to pay for most of the therapeutic resources we gathered from the forest. So our youth think that we thus collect the most and leave nothing behind."

The Kattunayakan tribes have long been guardians of environmentally responsible forest conservation methods that reflect their profound connection to nature. Due to the harmony between their way of life and the vulnerable forest environments they live in,

these indigenous tribes have flourished for millennia. Shifting agriculture, also known as “Podu,” is one of their most prominent practices. In this method, a small area of land is cleared for farming while the surrounding forest is left to gradually regrow. Their use of rotational farming minimises ecological disruption while also ensuring food security. The Kattunayakans encourage biodiversity in their farmed lands by avoiding monoculture and decreasing the likelihood of insect outbreaks.

Nithin (38 years) from Chukkalikuni settlements said,

“While going to the forest area to collect honey, I keep some quantity there for the wild animals. I learned this lesson from my grandfather. His generation has given more importance to wildlife and its resources. I heard the story of preserving food for wild animals during the summer season too. But now we are not having that much time to do all these activities. Resources are not enough to meet the needs of animals and people. We have to move out of the forest soon. Otherwise, life will be too complicated.”

They engage in sustainable non-timber forest product (NTFP) harvesting. In order to meet their immediate needs while letting the forest regenerate itself, they meticulously gather resources including bamboo, honey, and medicinal herbs. They have a deep understanding of the forest’s flora and fauna, which has been passed down through the centuries, ensuring that their practices are still environmentally friendly. The traditional spiritual practices of the Kattunayakans are also closely linked to nature, which fosters a sense of respect and obligation for their forest surroundings. The Kattunayakan tribes are a moving illustration of how indigenous knowledge may provide important insights into sustainable forest conservation in the face of contemporary environmental concerns through their ecologically responsible practices. Individual-based collection and selling takes the place of community-based gathering and sharing of forest resources.

Life Course Perspective of Ecologically Prudent Practices

Reflecting on a person's life trajectory using the best practices reveals how they change over the span of two generations, i.e., grandparents and great-grandparents. The great grandparents' generation exhibited meticulous behaviour in terms of how they used resources; nevertheless, the grandparents' generation's behaviour has changed as a result of the shifting socioeconomic structure.

Karikki shared her opinion in this regard;

"My childhood days were there deep inside the forest. Where we shared the stream, tubers, fruits, and leaves along with the wildlife. We were not selfish at that time. However, our daily needs increased when we relocated to the periphery forest zone, and we started to gather as many natural resources as we could. We didn't incur any costs when we were in the wilderness. We will start to get more money as we amass more resources."

Money became the basic minimum for the generation prior to our grandparents to cover their daily needs. The great-grandparents' generation strategically utilizes forest resources to meet their everyday needs.

Kittan, a great-grandfather from the Pullumala settlement said, "We simply pick medicinal herbs to heal our sicknesses; we have fruits and tubers to satiate our appetites and firewood for cooking. But now the situation has changed, our children need more money for their children's studies. So they are collecting more honey, and medicinal plants for finding out money. During my childhood days, we never collected the resources before it got ready to harvest. That's why the resources were more than sufficient for us. Now at this old age, either for us or for animals we are not getting anything from the forest. Yellow flowering plant (*Senna Specabilis*) captured almost all areas of our forest. So no native plants and our spotted deer lost their habitat too. The future of my people and animals will be more dangerous if the situation worsens."

The great-grandparents protected their forest and its resources. But nowadays the situation is changed because of human pressure and climate change. The need-based consumption pattern was prevalent among the great-grandparents' generation. They raised the standard for sustainable consumption habits among their people.

Biju (45 years) from Pullumala said,

"I collect forest resources such as wild honey, mangoes, and medicinal roots every season like April to June, October to November like that. My father said that the root of *sida cardifolia* (a medicinal plant- the root of this plant is a medicine) should be collected during the summer season after flowering. But for our convenience, we collect the same during the rainy season."

The opinion of the youth from the tribal hamlet pointed towards the extinction of these types of plants from the earth. As they are not collecting the roots after flowering, new plant growth or sapling availability may not take place. These unscientific collection practices are the major issue that exists in the forest region.

Tribal Culture and Conservation Practices

The Kattunayakan people's myths, rituals, taboos, and cultural norms have had a significant influence on forest conservation practices. The Kattunayakan's religious beliefs have an impact on their conservation practices. In holy groves, which serve as sites of prayer, the mudali (village head) speaks with his or her ancestors. Sacred groves, encircled by a stream and protected trees, are located on a small hill close to their communities. The deceased worshiped every tree and are buried beneath them. They all agree that the neighborhood should watch over this precious woodland.

Cheetha, a great-grandmother from Kumizhi settlement said;

"We believe that our ancestors are residing on the trees. We protect those trees. If we protect trees and wildlife, our ancestors would be pleased. When a child is born in our family, we used to give the name of our ancestors to the child. For

that naming ceremony, we use a dried fruit that is also considered auspicious. We will not hurt any plants or animals. They all have life as we have. We consider pumpkin as an auspicious plant and we plant the same before beginning anything new in our life. Colocasia plants also have a significant importance in our life like we use plantain leaves. For every auspicious occasion, we serve food on these Colocasia plants. But nowadays, it is replaced by paper plantain leaves”

In addition, numerous creatures and flora are adored. Due to their long-standing historical devotion, the banyan tree and the golden shower tree have both survived for many years.

Koori a grandmother from Chukkalikuni settlement said,

“My parents taught me to keep our streams clean and pure. My mother told me to not use water from streams during my menstrual cycle. We never use them or be a part of harvesting during our menstruation. I’ll become sick if I don’t obey these rules. Our community takes great care to protect forests and their resources as pure and precious.”

Ashokan (40 years), Kattunayakan youth had a different opinion, “In this modern time, it is not possible to keep all the rituals and beliefs to be practiced and norms to be followed. I am a daily wage labourer in the nearby paddy field of my settlement. Sometimes, I accompany one of the lorry drivers near my area as a helper and he pays me. These works are my livelihood options. We have to find a source of income for our survival. If we give importance to our ancestors and their forest protection rules, my children will be in poverty.”

The enduring cultural values, which are grounded in religious convictions, have significantly benefited India’s efforts to protect a number of species. Kattunayakans and their natural environs, particularly forests, are intricately entwined in tribal cultures all over the world. These societies frequently place a high value on ecologically sound, sustainable methods of forest conservation. Their all-

encompassing view of the natural world emphasizes the interdependence of all living things and the importance of striking a careful balance between human demands and biodiversity preservation. Tribal societies have not only maintained their way of life but also acted as stewards of priceless forest ecosystems, providing priceless lessons in peaceful coexistence with nature for current conservation efforts. These practices include community-based resource management, sacred groves, and traditional knowledge systems.

Participatory Conservation Practices in Kerala

In Kerala, top-down and exclusive participatory conservation practices have given way to those that acknowledge the rights and involvement of local residents. The Forest Rights Act, environmental activism, and a growing emphasis on sustainable development have all had an impact on the trajectory of conservation in the state. In order to address ongoing environmental challenges, it is projected that greater cooperation between communities, governmental entities, and non-governmental organisations will be needed in Kerala's participatory conservation in the future.

In terms of forest management, the last 20 years have seen a great deal of focus on ecological restoration and resource conservation. Significant interventions, such as Joint Forest Management (JFM) and Social Forestry, have been created to meet the needs of tribal subsistence and lessen the burden on forests and their resources. The Indian government has also started a number of other activities, initiatives, and Acts. The communities that rely on the forest benefit from a number of direct and indirect employment opportunities.

Karikkan the community head and great-grandfather said,
“My children get employment from the forest department. My youth days were largely spent inside the forest. At that time, we did not want money to purchase anything. Everything was available inside the forest. Our landowners from the fringe of the forest gave us some clothes. Forest gave us all edible things and medicines. But now the situation is not like that. There is

not sufficient food resources available inside the forest. Now, the forest department gives our children a six-month contract job. For the rest of the month, they rely on the forest to provide us with food. Otherwise, they go to work in the agricultural farm of the landlords. We are also given food grains by the government to survive. As a result, we do not want to collect and sell forest resources. But some of the children collect honey, medicinal plants, and fruits from the forest and they sell them in the market. After selling the medicines in the market they buy medicine from the town. This change is also there in our place.”

Participatory forest management is defined as a co-management effort and reciprocal contact between two stakeholders, such as village communities and the Department of Forests. Mediators are typically non-governmental entities. Numerous job opportunities have been made possible by these PFM initiatives in industries like soil and water conservation, nursery preparation, fencing, planting, protection, and plantation management, as well as research and training, surveying of forest resources, protecting and conserving forest resources, and surveying and processing of non-timber forest products (NTFPs).

A fantastic intervention was made when the Kerala State implemented Participatory Forest Management in response to Joint Forest Management. The Wayanad Wildlife Sanctuary offers Kattunayakan villages more alternative employment opportunities, including artisan work and seasonal jobs like anti-poaching, fire prevention, and elephant scaring. It is impossible to overestimate the value of public participation in protecting the forest and its treasures. The end outcome of training courses for alternative income-generating enterprises would be a group of self-sufficient people if financial support was given for its implementation as a first investment. As a result, there may be less reliance on the forest and its resources.

Maari, a grandmother from Maalappadi settlement said;

“My daughters and sons go for six months’ job with the forest department. The forest department pays us a minimum wage.

The minimum pay was also disclosed to us by the department. It helped us to demand the minimum wage from outsiders as well. Sometimes, the landowners refuse to pay the minimum wage, at that time, we inform the matter to the forest department and they make some interventions and we get the actual wage. I am also a member of the Eco Development Committee under the forest department.”

Eco Development Committees are there as a part of participatory forest management. This is an initiative from the side of National Forest Policy 1988. This policy ensures people’s livelihood security through their participation in managing forest resources and conserving wildlife. The responsibility of Eco Development Committees is to engage in forest conservation activities. Through the activities of participatory forest management, tribal communities become able to make decisions regarding the use of forest resources, and employment choices. This participation guarantees that their traditional wisdom and environmentally friendly practices are recognised and incorporated into forest management plans. By giving voice to underrepresented groups, it fosters social equality by lowering their susceptibility to exploitation. PFM advocates for the wise use of forest resources. Tribes in Kerala have a thorough awareness of the regional ecology and can offer insightful information about ethical harvesting methods that would boost conservation efforts. Tribes can contribute to preventing over-exploitation and maintaining ecological balance by actively taking part in forest management. PFM can improve indigenous groups’ economic prosperity. Tribes can make money by engaging in sustainable harvesting and selling non-timber forest products (NTFPs). Additionally, PFM efforts frequently include training and capacity-building programmes, allowing tribes to expand their options for a living and increase their financial security.

Ramesh (36 years), had an opinion,

“I participated in various training programs that focused on the importance of scientific collection practices. From those classes, I learned about the need for the conservation of forest

produce. As per their suggestion, I started to harvest forest resources at the exact time. But some of my friends are not following the instructions given by our forest officers. Nowadays the human-wildlife conflict is more severe. Lots of our people lost their lives. This is also an impact of unavailability of forest resources.”

By letting tribes maintain their customs, PFM respects and protects this cultural heritage. This preserves cultural identity while also enhancing Kerala’s overall cultural tapestry. PFM promotes responsibility and openness in forest management. It improves governance and decreases illicit activities like poaching and illegal logging by involving local communities in monitoring and enforcing norms. In general, this helps maintain peace and order in forested areas. Participatory forest management may have a variety of advantageous benefits, such as financial empowerment, independence of women workers, and little reliance on the woods.

Critical Socio-Environmental Issues Raised by This Study

- Human pressure on forests and their resources became one of the important reasons for natural resource depletion.
- The forest resource depletion can be considered as one of the major reasons for increasing human-wildlife conflict.
- Shift from aged groups’ ecologically prudent practices to youth’s profligate practices led to the scarcity of forest resources and allied issues.
- Lack of forest-based livelihood opportunities becomes a reason for the poor socio-economic condition among Kattunayakan youth.

Conclusion and Policy Implication

The Kattunayakan community’s adoption of environmentally responsible behaviour has significant policy ramifications for conservation and sustainable development initiatives. In order to maintain the delicate balance between human existence and the natural environment, policymakers can benefit from the community’s wisdom

by recognising and encouraging their traditional ecological knowledge and practice. This could entail putting rules in place that enable the Kattunayakan people to keep up their ethical farming, gathering, and hunting practices while also granting them access to healthcare and education to enhance their general well-being. Additionally, by encouraging collaborations between the Kattunayakan community and pertinent governmental or non-governmental organisations, policies that safeguard and preserve their ancestral lands and natural habitats can be developed, ultimately advancing the larger cause of biodiversity conservation and ecological sustainability.

According to the study, a participatory model for resource management ought to be an essential part of the integrated forest management system. It is also encouraged to develop alternative income-generating activities specifically for communities that depend on forests because of their population's growing inclination to use less forest resources. Participatory forest management can be made more widely known throughout all states in order to put into place community-based protection measures and promote community-based alternative vocational programmes.

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Impact of Frailty and Death Anxiety on the Quality of Life among Elderly Population

Samya Marwaha, and Nupur Agarwal

Department of Psychology, Sushant University, Gurgaon (Haryana)

ABSTRACT

This correlational and cross-sectional study aimed to investigate the impact of Frailty and Death Anxiety on the Quality of Life of randomly selected 120 elderly, ages varying from 60 years and above residing in the Delhi-NCR Region. Tilburg Frailty Indicator, Death Anxiety Questionnaire, and World Health Organization Quality of Life Questionnaire-8 were used to collect data. Statistical Analysis was performed with the help of Jamovi, Version 2.3.21. The results revealed that there exists a strong negative correlation between Frailty levels and Quality of Life ($r=-0.822, p<.001$) and a weak negative correlation between Death Anxiety and Quality of Life among the elderly ($r=-0.22, p=0.815$). Also, Females are having high levels of frailty in comparison to males. However, no significant differences exist in older adult's quality of life with and without a spouse. Based on present findings it may be concluded that frailty is a predictor of quality of life, whereas death

anxiety is not. As a result, interventions to reduce frailty levels among the elderly and to enhance the quality of life in older adults can be proposed.

Keywords : Old Age, Frailty, Death Anxiety, Quality of Life, Delhi-NCR

Frailty is a state that is clinically recognizable in the elderly who are highly vulnerable to age-related declines, which affect their ability to cope with daily stressors. The process of frailty is very subjective in every individual (Gobbens. R, 2010). Frailty usually begins at 65 years of age and escalates around 70 years of age. There are 4 determinants of Frailty in elderly adults: Physical Frailty, Psychological Frailty, Social Frailty, and Cognitive Frailty.

Research has indicated that there exists a relationship between frailty and fear of one's death which is known as death anxiety. Chibnall, *et al.*, (2002) studied the variables of disease, health care, psychosocial-spiritual factors, and death distress (death-related depression and anxiety). The study was conducted in Missouri on a sample of 70 patients. The findings revealed that living alone was associated with higher death distress, greater physical symptom severity, more severe depression symptoms, lower spiritual well-being, and less physician communication as perceived by the patient. Similarly, Zhao, *et al.*, (2020) investigated the variables of depression, anxiety, and frailty. The study was conducted in China on a sample of 4103 community-dwelling adults in the age group of 60 years and above. This study revealed that comorbid depressive and anxiety symptoms were associated with frailty among Chinese older adults.

Death is an aspect of human life that is inevitable. As elderly adults reach their approaching fate i.e., death, they experience high levels of anxiety, low levels of safety, and a strong sense of fear. This mental state of fear and anguish is termed death anxiety (Zhang, *et al.*, 2019). Death Anxiety has been defined as a feeling of unsafety, anxiety, or fear related to death or near death. Fear of death, especially

in the elderly, can negate the sense of happiness, and fulfillment (Yalom, 2008). Death Anxiety is also referred to as “Thanatophobia.” Thanatophobia is derived from the Greek word “*Thanatos*” meaning “*death*” and “*Phobos*” meaning “*fear*”. Death Anxiety is not a formal disorder in the Diagnostic and Statistical Manual of Mental Disorders, but it is considered to be a part of a specific phobia.

Many studies have found associations between death anxiety and quality of life. Hashim, *et al.*, (2022) studied the variables quality of life, perceived social support, and death anxiety. The study was conducted in Pakistan on 500 patients suffering from cardiovascular diseases. The findings showed that there is a negative relationship between quality of life and death anxiety, but a positive relationship between hope and quality of life. Khaki, *et al.*, (2017) studied the variables of depression, death anxiety, and quality of life. The study was conducted in Iran on a sample of 294 elderly citizens. The results revealed that there was a significant relationship between depression and the quality of life ($P < 0.0001$) but there was no significant relationship between the quality of life and death anxiety.

The term quality of life has been defined as the perception or beliefs of individuals regarding their overall position in life in terms of their culture and system of values, in which they live, and their expectations, goals, concerns, and standards. World Health Organization (1995) defines Quality of Life as “an individual’s perception of his/her situation in life in the context of culture, the patterns of values in which he/she lives, and the extent or incompatibility of this with his/her goals, expectations, and interests for mental health, independence, and personal and social relationships”. Quality of life can be objective as well as subjective. Quality of life is a holistic concept. According to World Health Organization, there are 4 domains of Quality of Life : Physical Domain, Psychological Domain, Social Relationships Domain, and Environmental Domain.

According to studies, quality of life is correlated to frailty in the elderly. Lin, *et al.*, (2022) investigated the relationship between the

variables frailty, quality of life, daily physical activity, and Healthy Life Self-Efficacy. Their search was conducted in Taiwan on 210 community-dwelling older adults in the age group of 60 years of age and above. It was discovered that frailty had both direct and indirect effects on QoL. Also, Gobbens, *et al.*, (2017) investigated the relationship of physical, psychological, and social domains of frailty with quality of life. The study was conducted on 671 Dutch citizens in the age group of 70 years and above. The findings revealed that the physical, psychological, and social components of frailty are related to quality of life in older adults. The current study aims to bridge the gaps in previous literature and shall suggest interventions in the field of clinical psychology and gerontology so that elderly citizens can make a smooth transition to the last stages of their lives. The living arrangement is also related to the elderly's level of personal and social control and competence, as well as the quality and quantity of social contacts they have. The objective of the present study was to see the relationship between frailty, death anxiety, and quality of life among older adults and to suggest interventions at the community level to prevent frailty and improve the quality of life of older adults.

Methods

Sample

In this correlational and comparative research design 120 elderly adults both males and females in equal numbers, ages of 60 years and above, were selected by the convenience sampling technique. The elderly who had given consent to participate by filling out the informed consent and were not suffering from any terminal illness were included in the study.

Tools Used:

- Tilburg Frailty Indicator (Gobbens, *et al.*, 2010):
The Tilburg Frailty Indicator is a tool used to measure Frailty in older adults. TFI comprises 15 items measuring 3 domains of frailty: physical domain, psychological domain, and social domain. The reliability index for overall frailty

came out to be 0.73, 0.70 for the physical domain, 0.63 for the psychological domain, and 0.34 for the social domain. The scale has high validity.

- Death Anxiety Questionnaire (Conte, *et al.*, 1982):

The Death Anxiety Questionnaire measures fears and worries related to suffering, loneliness, and the unknown and personal extinction. It consists of 15 items and can be administered to individuals who are in the age group of 30-82 years. The DAQ's internal consistency was 83, and test-retest reliability was 87. DAQ has high validity as it can be applied to nursing home residents, senior citizens, and college students.

- World Health Organization Quality of Life Questionnaire (WHOQOL group, 2012):

Quality of life is measured using EUROHIS-QOL 8 items or WHOQOL-8 items. The questionnaire has 8 items and can be administered to anyone who is in the age group of 18 years and above. The WHOQOL-8 items investigate a person's satisfaction with four domains of life: overall quality of life (global), physical health, psychosocial, and environmental domains. The scale's reliability was calculated to be 0.81. The scale has high validity.

Procedure

The elderly were approached personally and data was collected with their consent. The data was collected between 1st March 2023 to 10th April 2023. Questionnaires took approximately 25-30 minutes for every Elderly. The elderly adults were assured that their information would be kept private and used solely for research purposes. Following that, the Elderly were thanked for their cooperation. The data thus gathered was statistically analyzed. Data was analysed by using Jamovi, Version-2.3.21. The analysis in the current study involves using descriptive statistics and inferential

statistics. To check the impact of frailty and death anxiety on the quality of life among the elderly, regression analysis was applied. In this study, there are two predictors or independent variables i.e., frailty and quality of life, and one outcome or dependent variable i.e., quality of life. Therefore, this study implies multiple regression analysis. To determine significant differences based on gender and death anxiety (with and without spouses), an independent sample t-test is applied.

Results

Table 1
Showing Descriptive based on Mean, SD, Maximum, and Minimum values of the variables

	N	Mean	SD	Minimum	Maximum
Frailty	120	4.97	3.03	0	12
Death Anxiety	120	6.92	5.04	0	19
Quality of life	120	31.95	4.77	19	40

The above table displays the overall frequency, mean, standard deviation, and maximum and minimum values of the variables. The N (frequency value) of all variables is 120. The mean values for frailty, death anxiety, and quality of life are 4.97, 6.92, and 31.95, respectively. The three variables' standard deviations were 3.03, 5.04, and 4.77, respectively. The maximum and minimum frailty scores are 12 and 0. It is 19 and 0 in terms of death anxiety and 40 and 19 in terms of quality of life.

The Pearson R correlation matrix between the variables Frailty, Death Anxiety, and Quality of Life, as well as their associated p-values, is shown in the table 2. The Pearson R correlation between frailty and death anxiety was 0.126, indicating a weak positive relationship between the two. The corresponding p-value was calculated to be 0.170. As a result, the relationship between frailty and death anxiety is not statistically significant ($p>0.05$). As a result, the link between Frailty and Death Anxiety is insignificant. The Pearson R correlation coefficient between Frailty and Quality of Life was -0.822, indicating

a strong negative relationship between the two variables. This demonstrates that as frailty scores increase, quality of life scores decrease. $P < 0.001$ is the statistical significance of the corresponding p value. The Pearson R correlation coefficient for Death Anxiety and Quality of Life was -0.022, indicating a very weak negative relationship between the two. The associated p-value was 0.815, which is not statistically significant ($p > 0.05$).

Table 2

Correlation Matrix showing the relationship between the three variables

	Frailty	Death Anxiety	Quality of life	
Frailty	Pearson's r	—		
	p-value	—		
Death Anxiety	Pearson's r	0.126	—	
	p-value	0.170	—	
Quality of life	Pearson's r	***	—	
	r	-0.822	-0.022	
	p-value	< .001	0.815	—

Note. *** $p < .001$, ** $p < .01$, * $p < .05$

Table 3

Showing the Regression model fit (Multiple Regression coefficient and R^2 coefficient) of the variables

Model	Multiple R	R^2
1	0.752	0.565

Table 3 displays the model fit measures, which show how well the regression model fits the data. The correlation coefficient (Multiple R) between the independent variables (Frailty and Death Anxiety) and the dependent variable (Quality of Life) is 0.752, indicating a

strong positive relationship. The coefficient of determination (R^2) represents the proportion of change or variance explained by predictor variables in the outcome variable. In this case, the R^2 is 0.565, indicating that Frailty and Death Anxiety explain 56.5% of the variance in Quality of Life. As a result, the model is not a good fit.

Table 4

Showing the Regression Model Coefficients - Quality of life

Predictor	Estimate (β)	t	p
Intercept	34.6553	39.062	< .001
Frailty	-0.5564	-5.471	<.001
Death Anxiety	-0.0311	0.430	0.668

The Regression model coefficients for each predictor variable are shown in the table 4, along with their standard errors, t-values, and p-values. The intercept is 34.6553, which is the expected value of the outcome variable (Quality of Life) when both predictor variables are 0. For frailty the estimated coefficient (β) came out to be -0.5564. This indicates that for every 1-unit of increase in frailty levels of the elderly, the expected value of Quality of Life decreases by 0.5564 units. This relationship is statistically significant as $p < 0.001$. For Death Anxiety, the estimated coefficient (β) is -0.0311 indicating that for every 1-unit increase in the Death Anxiety levels of elderly, the expected value of Quality of life decreases by 0.0311. The associated p-value is 0.668. This shows that the relationship is statistically insignificant ($p > 0.001$).

Table 5

Showing the Group Descriptives of the scores of Frailty based on Gender

	Group	N	Mean
Frailty	Males	60	2.97
	Females	60	6.98

Table 5 shows the comparison between the means of scores of frailty of males and females. Out of 12 elderlies, 60 were males and 60 were females. The mean score of the male group came out to be 2.97, whereas the mean score of the female group came out to be 6.98.

Table 6

Showing the analysis of the scores of Frailty using Independent Samples T-Test

		Statistic	df	p	Mean difference
Frailty	t	-9.70	118	0.032	-4.02

The above table depicts the scores of independent sampled t-tests. The mean difference between the scores of males and females is 4.02. This indicates that the mean frailty scores of females were 4.02 points higher than the mean frailty scores of males. Df refers to the degree of freedom which is calculated by the sum of samples minus 2. The t-value came out to be -9.70. The corresponding p-value or sig. came out to be 0.032 which is less than 0.05. Since $p < 0.05$, the t-test is statistically significant which shows that there exist actual significant differences between the mean of scores of frailty levels of males and females.

Table 7

Showing the Group Descriptives of the scores of Death Anxiety based on Marital Status

	Group	N	Mean
Death Anxiety	Without spouse	40	6.78
	With spouse	80	7.00

Table 7 shows the comparison between the means of scores of death anxiety among elderlies with a spouse and without a spouse. Out of 12 elderlies, 80 were with a spouse and 40 were without a spouse. The mean score of the death anxiety of elderlies with a spouse came out to be 7.00, whereas the mean score of the death anxiety of elderlies without a spouse came out to be 6.78.

Table 8
Showing the analysis of the scores of Death Anxiety using Independent Samples T-Test

		Statistic	df	p	Mean difference
Death Anxiety	t	-0.230	118	0.819	-0.225

Table 8 depicts the results of independent sampled t-test. The mean difference between the score came out to be 0.12. This indicates that the mean death anxiety scores of elderlies with spouses were 0.12 points higher than the mean death anxiety scores of elderlies without spouses. Df refers to the degree of freedom which is calculated by the sum of samples minus 2. The T-value came out to be -0.230 and the corresponding p value came out to be 0.810 which is greater than 0.05. Because the p-value is greater than 0.05, the t-value is not statistically significant, and there is no significant difference in the mean death anxiety scores of elders with and without spouses.

Discussion

The current study aimed to investigate the impact of frailty and death anxiety on the quality of life among elderly population. In the study, it was indicated that the regression model is not a good fit as frailty and death anxiety can only predict 56.5 per cent of the variance in quality of life scores (Multiple R=0.752, R²=0.565). Also, the associated t-value is significant in case of frailty (t=-5.471, p<.001), but insignificant in case of death anxiety (t=0.430, p=0.668). Thus, the findings indicate that frailty is a significant predictor of quality of life. Conversely, Death Anxiety is not a predictor of Quality of Life. However, the regression model is not a good fit.

Frailty as a predictor of quality of life is consistent with Gobbens, *et al.*, (2014) work on the prediction of quality of life in community-dwelling older people by physical, psychological, and social components of frailty. According to the findings, all domains of frailty predicted future quality of life domain scores. Another study, Limpawattana, *et al.*, (2022), supports the current study’s findings.

Physical and cognitive frailty was found to be negatively associated with quality of life and negative outcomes such as hospitalization in Geriatric patients.

The correlation matrix depicted that Frailty and Quality of Life are significantly negatively correlated ($r = -0.822$, $p < .001$), indicating that as frailty increases, the quality of life decreases. This relationship is highly significant as the p-value is less than .001. These findings support previous claims about the negative relationship between frailty and quality of life. The point was reinforced by Papathanasiou, *et al.*, (2021), who discovered a significant negative correlation between frailty and quality of life in Community-Dwelling Older Adults. Physical frailty, psychological frailty, and all QOL dimensions were found to have a statistically significant negative relationship, as were social frailty and social relationships, and total frailty and all QOL dimensions. Frailty hurts all aspects of QOL. Aylward, *et al.*, (2021) discovered that a lower frailty index predicted better quality of life scores among older adults after cochlear implantation.

Death Anxiety is not a significant predictor of quality of life among the elderly. These findings support the findings of Sochukwuma, *et al.*, (2022), who investigated death anxiety and quality of life (health-related) in diabetic elderly patients. There was no link discovered between death anxiety and health-related quality of life. Death Anxiety has a weak negative correlation with frailty ($r = -0.22$, $p = 0.815$), which is considered negligible. Because the p-value is higher than .001, the correlation is also not statistically significant. The findings did not support the previous studies' findings. Zhao, *et al.*, (2020) investigated comorbid depressive and anxiety symptoms, as well as frailty, in older adults. The findings revealed that depressive and anxiety symptoms which were comorbid were linked to frailty in Chinese elderly people.

The results of the current study also reported that there exists a very weak and non-significant correlation between death anxiety and quality of life ($r = -0.022$, $p = 0.815$). The findings were consistent with the findings of Urien and Kilbourne (2008), who discovered no

direct link between death anxiety and quality of life. As a result, death anxiety has no direct relationship with quality of life. However, the current study's findings did not agree with those of another study conducted by Hussain, *et al.*, (2021). He investigated the impact of death anxiety on quality of life in cancer patients and discovered a negative relationship between death anxiety and quality of life. The current study's weak correlation may be because very few elderly people reported high death anxiety, and the current study was not conducted on clinical samples.

The results also revealed that there exist significant differences between the mean scores of males and females based on frailty levels (mean difference = -4.02, t-value = -9.70, $p = 0.032$). Furthermore, the results are statistically significant ($p < .005$). Thus, it can be inferred from the findings that females ($N = 60$, Mean = 6.98) are more frail in comparison to males ($N = 60$, Mean = 2.97). The pattern of the result is consistent with the previous literature. Gordon, *et al.*, (2017) studied gender differences in frailty levels. The findings revealed that females were frailer in comparison to males, although levels of frailty were high in both males and females. Alexandre, *et al.*, (2016) also investigated gender differences which are an incidence and determinant of frailty phenotype components among older adults. Slowness and unintentional weight loss were found to be more common in men aged 74. Except for weakness, the other components of frailty were more common in women of all ages.

A possible explanation for why females are frailer in comparison to males is due to the poor health status of females in comparison to males. Also, there is a combination of biological, behavioural social factors underpinning frailty levels among males and females (Gordon *et al.*, 2019). According to Corbi, *et al.*, (2019), men and women have distinct environmental exposure, risk factors, and levels of vulnerability that are frequently overlooked.

Also, there exists no significant differences in the death anxiety levels of elderly people with and without spouses (mean difference = -0.225, t-value = -0.230, p -value = 0.819). Also, the results are

not statistically significant as the p-value is greater than 0.005. Thus, it can be inferred from the findings that there are no significant differences in the death anxiety levels of the elderly with spouses (N = 80, Mean = 7.00) and elderly without spouses (N = 40, Mean = 6.78). From the findings, it was evident that no significant differences are there in the death anxiety levels of the elderly with spouses and without spouses. The findings of the study didn't support the evidence found in previous literature. Zahedi Bidgol, *et al.*, (2020) investigated Death Anxiety and its factors in elderly people. He discovered that there are significant differences in the death anxiety levels of the elderly based on marital status. Older adults with spouses have lower death anxiety than older adults without spouses. Singh, *et al.*, (2017) investigated the influence of age and marital status on Thanatophobia (Anxiety about Death) in Adult Women. The findings revealed that single women were more likely than married women to have high levels of death anxiety. Sebea, *et al.*, (2021) conducted another study to determine the factors associated with death anxiety in older adults. According to the findings, marital status is a significant predictor of death anxiety. In comparison to older people with spouses, older people without spouses have higher levels of death anxiety.

A possible explanation to why older adults without spouses have high levels of death anxiety in comparison to older adults with spouses could be loneliness. Old age is a very crucial stage of one's life. Being lonely can increase anxiety levels among the elderly regarding their death. Loneliness increases with the loss of a spouse. Greenblatt-Kimron, *et al.*, (2021) investigated death anxiety and loneliness in elderly people. Death anxiety was found to be positively correlated with loneliness in older adults. Ergin, *et al.*, (2022) investigated the relationship between death anxiety, loneliness, and psychological well-being in nursing home residents. The findings revealed that death anxiety is strongly linked to loneliness and psychological well-being.

Conclusion

The current study aimed to investigate the impact of frailty and death anxiety on the quality of life of older adults. The findings of the study revealed that a strong negative correlation exists between frailty and quality of life and a weak negative correlation between death anxiety and quality of life. The findings also revealed that frailty levels are higher in females in comparison to males. Given the concluding lines, it can be suggested that frail adults need more care in comparison to non-frail adults. This insight can contribute to developing both physical and mental health care interventions for them so that their quality of life can be improved.

Limitations, Implications, and Future Suggestions

Every research project should fill a knowledge gap and provide solutions to a problem. Certain implications are suggested by the current study. The current study gives a direction for interventions in the field of clinical psychology and gerontology to help elderly to make a smooth transition to the last stages of their lives. Psychologists and other health professionals can use these results while providing mental health services in terms of enhancing the quality of life and reducing death anxiety among elderly. Every study has some limitations, and the current study is no exception. The sample size selected for the study is very small, therefore the results cannot be generalised to a larger chunk of the population. The study ignored clinical samples (elderly suffering from chronic diseases, terminally ill or bedridden) which can produce more significant results. Also, the findings didn't highlight the role of physical, psychological and social domains of frailty due to time limitations. Based on the findings, conclusion, limitations, and the personal experiences of the researcher, many recommendations can be proposed for future research. The findings obtained from the research study were confined to 120 samples in Gurgaon, Haryana. Further research can be carried out with a larger population covering a wider geographical area. For more

in-depth knowledge regarding the impact of frailty on quality of life, measuring and determining the impact of components of frailty (physical, social, and psychological) on quality of life can be considered in the future. The study included only non-clinical and residential populations of older adults. The research can be further extended by conducting it on clinical samples and community-dwelling older adults.

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Cognitive Status as a Determinant of Functional Competence among Older Adults

K. Lalitha, and B.V.K.Dheeraj

Department of Psychology,
Y.V. University, Kadapa- 516005 (A.P.)

ABSTRACT

The present study was carried out to compare the cognitive status and functional competence of community-dwelling 240 older adults, both males (N=126) and females (N=114) from the rural and urban areas of 6 districts of Andhra Pradesh. The standardized tool, MMSE, and Disability scales were used to assess the cognitive status and functional competence among older people. The results show people with high cognitive functioning had a high level of functional competence.

Keywords : Cognitive status, Functional competence, older adults

Cognitive function is a broad term that refers to mental processes involved in the acquisition of knowledge, manipulation of information, and reasoning. Cognitive functions include the domains of perception, memory, learning, attention, decision-making, and language abilities. Research indicates that as we age, our cognitive function tends to decline. Age-related cognitive changes include processing things more slowly, finding it harder to recall past events, and a failure to remember

information that was once known (such as how to solve a particular math equation or historical information).

Disability is commonly defined as difficulty in performing activities necessary for independent living, such as basic activities of daily living (ADLs) and complex instrumental activities of daily living (IADLs) (Tas, *et al.*, 2007). Disability among older people is the result of not only health problems but also the interactions between health conditions, activity and participation, personal factors, and environmental factors (Connolly, D., *et al.*, 2017). The occurrence and level of disability are related to the health conditions and the resulting disabilities in interacting with the physical and social world (Bickenbach, *et al.*, 2017). Higher socioeconomic condition is closely linked with a lower prevalence or incidence rate of disability (Wolf, *et al.*, 2005; Freedman, *et al.*, 2008; Wen & Gu, 2011;). Researchers have also reported socioeconomic factors to be important mediators for gender differences in disability (Crimmins & Saito, 2000).

One of the best ways to evaluate the health status of older adults is through functional assessment which provides objective data that may indicate future decline or improvement in health status. Compared to the other functionalities, the prevalence of visual impairment is found to be the most common (Sengupta, *et al.*, 2007; Dey, 2009; Goswami, *et al.*, 2019). Functional ability declines with advancing age (Chilima, 2000). Studies have shown that older adults tend to overestimate their ability or reported level of functioning, and informant-based instruments are potentially subject to various biases. It is usually conceptualized as the ability to have self-care, and self-management and to carry out physical activities of daily living without support (Chilima, 2000; Subramanyam, 2011). It can be described as a combination of the overall impact of medical conditions, lifestyle, and age-related physiological changes in the context of the environment and social support system. The concept of the degree of functionality is wide and ill-defined, ranging from 'maintenance of

life’ to ‘socio-economic productivity’. Thus, there is always an ambiguity about the definition of the term ‘functionality’ between its medical and social usage (Dey, 2009).

Limitations in functioning and dependence on other people in performing daily activities lead to a worse quality of life for older people and an increase in the social costs of care and health (Thompson, *et al.*, 2012). Limitation of activity leads to a decrease in functional conditions and an increased risk of further ADL and IADL limitations (Boyle, PA., *et al.*, 2007). A previous study in the Indian context noted that a higher proportion of older adults reported IADL than ADL in India (Patel, R. *et al.*, 2021).

Functional status makes a person psychologically, physically, emotionally, and spiritually sound to make better decisions, deal with environmental situations, participate constructively in society, and capacitate the achieving of satisfaction and an everlasting state of happiness. Physical activity seems to be an effective way to slow down the loss of cognitive ability through age. A recent study of the LASI dataset from the International Institute for Population Science, Mumbai, explored the effect of exercise on the cognitive health (‘cognitive functioning’) of people aged 60 years and older. The researchers drew on data from more than 30,000 individuals across India from various social and economic backgrounds and the outcomes were having difficulty in at least one ADL/IADL (Muhammad, T., *et al.*, 2023). Everyday cognitive competence is defined as the ability to perform adequately those cognitively complex tasks of daily living considered essential for living on one’s own in this society (Willis, 1991, 1996a, 1996b; Lalitha, 2012).

Because of the growing elderly population and their cognitive impairment, there is a dearth of research on the impact of cognitive impairment among older adults. Keeping in mind the above issues this study was planned with the following objectives:

- To assess the levels of cognitive functioning in different sub-groups.

- To assess the functional competence of the community-dwelling older men and women.
- To assess the relationship between Cognitive status and socio-demographic variables.
- To assess the relationship between Cognitive status and functional competence.

METHOD

Sample

240 older persons (126 males, and 114 females), ages varying from 60 to 80 years, were selected by multi-stage random sampling technique from urban and rural areas of five districts, namely Kadapa, Chittoor, Nellore, Anantapur, Kurnool of Rayalaseema region in Andhra Pradesh. Only subjects who were healthy, community-dwelling, and those without any marked disabilities were included in the main sample.

Inclusion criteria

- The subjects in the age of 60- 75 years.
- Willingness to participate in the study.
- Cognitively intact, healthy, community-dwelling, and those without any marked disability.
- No History of severe psychological disorders and hospitalization in the previous year.
- Ability to communicate verbally and understand the instruction.

Tools Used in the Study

1. Cognitive assessment was carried out by using: the Mini Mental State Examination (MMSE): MMSE is one of the most commonly used instruments for screening cognitive functioning and assessing the domains of cognitive functions including orientation, registration, attention, calculation, and memory recall. Obtainable scores on the

MMSE range from 0 to 30, whereby a score of lower than 25 indicates the likelihood of cognitive impairment. Scores of 21-24 are considered mild, 10-20 as moderate, and 1-10 as severe impairment (Folstein, *et al.*, 1975).

2. Functional competence was assessed by using : Disability Scale (Ramamurti & Jamuna, 1996) was standardized on the Indian elderly and was used to assess functional competence in the sample, respectively. The disability scale consists of four sub-scales viz., Assessment of Functional capability in Activities of daily living (ADL) and instrumental Activities of Daily Living (IADL), Performance-based functional capability in motor tasks (PBADLs), and self-perception of disability (SPD). A higher score indicates a high disability.

Procedure

Each respondent was personally contacted and explained the importance of the study. Only those respondents were included in the study who gave their consent willingly.

Result and Discussion

The Data related to the level of Cognitive functioning in different age groups show that in the age group of 60-65, only 1 percent of respondents reported severe cognitive impairment, 4 percent reported moderate level of impairment, 28 percent reported mild and 67 percent reported normal cognitive functioning. In the age group of 66-70 years, no one reported severe level, 5.5 percent with moderate functioning, 32.7 percent with mild, and 61.8 percent reported normal cognitive functioning. In the age group of 71-75 above years only 1 percent reported severely impaired, 6.8 percent moderate functioning and 43.2 percent reported mild and 48.9 percent reported Normal cognitive functioning. It is clear that as age increases the level of cognitive functioning decreases. Gender-wise scores show that Males reported 0 percent cognitive impairment

whereas the female group reported 1.8 percent cognitively impaired. At a moderate level, males reported 3.2 percent, and females reported 8.8 percent. In mild levels of cognitive functioning males reported 30.4 percent and females reported 39.5 percent. 67.2 percent of males reported Normal cognitive functioning and 50 percent of females reported Normal level of functioning. Scores indicate that females reported poor cognitive functioning compared to males.

Table 1

Levels of cognitive functioning in different Socio-demographic variables by using MMSE

S. NO.	SUB-GROUP	N	SEVERELY IMPAIRED	MODERATE	MILD	NORMAL
1	AGE					
	60-65	100	1(1%)	4(4%)	28(28%)	67(67%)
	66-70	52	0(0%)	3(5.5%)	17(32.7%)	32(61.8%)
	71-75 Above	88	1(1%)	6(6.8%)	38(43.2%)	43(48.9%)
2	GENDER					
	Male	126	0(0%)	3(3.2%)	38(30.4%)	85(67.2%)
	Female	114	2(1.8%)	10(8.8%)	45(39.5%)	57(50%)
3	EDUCATION					
	No Formal Education	134	2(1.5%)	12(9.0%)	52(38.8%)	68(50.7%)
	Primary Education	64	0(0%)	1(1.6%)	24(38.1%)	39(60.3%)
	High School Education	28	0(0%)	0(0%)	6(21.4%)	22(78.6%)
	College Education	14	0(0%)	0(0%)	1(7.1%)	13(92.9%)
4	LOCALITY					
	Rural	139	1(0.7%)	4(2.9%)	46(33.1%)	88(63.3%)
	Urban	101	1(1.0%)	9(3.8%)	37(36.6%)	54(53.5%)

The data related to the level of Cognitive functioning in different educational groups show that in the No formal education group, there are 1.5 percent with cognitive impairment, 9 percent with moderate impairment, 38.8 percent with mild impairment, and 50.7 percent with normal cognitive functioning. In the Primary education group, there are no impaired, 1.6 percent moderate, 38.1 percent mildly impaired, and 60.3 percent with no impairment. In High school education, there

are no severely impaired and no moderately impaired, 21.4 percent of people with mild impairment, and 78.6 percent of normal cognitive functioning. In the college education group, there are no people with severe and moderate impairment, 7.1 percent with mild, and 92.9 percent with normal cognitive functioning. Locality-wise scores show that rural people reported 0.7 percent cognitive impairment whereas the urban group reported 1 percent cognitive impairment. At the moderate level rural group reported 2.9 percent, urban group reported 3.8 percent. In mild levels of cognitive functioning, rural people reported 33.1 percent, and urban reported 36.6 percent. 63.3 percent rural group reported Normal cognitive functioning and with 53.5 percent of urban subjects reported a Normal level of functioning. Scores indicate that urban people reported poor cognitive functioning compared to their rural counterparts. The above data about cognitive function in different socio-demographics indicates that education plays a major role in maintaining good cognitive functioning. The above data supports the importance of socio-demographic variables in maintaining good cognitive function.

Based on the present findings a significant difference in the levels of cognitive functioning in different sub-groups was found. It means the findings revealed that cognitive functioning shows that subgroups namely age, gender, education, and Location differed significantly.

Table 2

Means, S. D's and 't' value related to DISABILITY (ADLs & IADLs) in Different Sub groups

S. No.	Sub-Group	N	Disability-ADLs		Disability-IADLs	
			Mean (σ)	t	Mean (σ)	t
1	Age					
	60-65	100	25.59(9.71)	0.55(a-b)@	4.55(2.09)	0.08(a-b)@
	66-70	52	26.53(10.63)	2.68(b-c)**	4.51(2.23)	2.11(b-c)*
	71-75	88	33.94(18.01)		5.34(2.21)	
2	Gender					
	Male	126	29.00(14.11)	0.16@	4.54(2.15)	2.13*
	Female	114	28.70(14.10)		5.14(2.20)	

3 Education					
No Formal Education	134	29.51(13.81)	0.15(a-b)@	5.32(2.13)	3.56(a-b)**
Primary Education	64	29.18(13.95)	1.98(b-c)*	4.18(2.03)	1.33(b-c)@
High School	28	23.64(7.17)	1.61(c-d)@	3.60(1.61)	2.77(c-d)**
Education College	14	31.50(23.94)		5.50(2.82)	
Education					
4 Family Status					
Nuclear	148	28.40(12.9)	0.63@	4.75(2.03)	0.74@
Joint	92	29.58(15.7)		4.96(2.43)	
5 Locality					
Rural	139	27.89(11.51)	1.23@	4.34(1.98)	4.17**
Urban	101	30.17(16.96)		5.50(2.30)	
6 Income Source					
Salary	21	31.47(23.30)	0.73(a-b)@	4.95(2.90)	0.13(a-b)@
Pension	153	28.90(13.56)	0.62(b-c)@	4.88(2.13)	1.22(b-c)@
Savings	19	26.89(8.54)	0.46(c-d)@	5.52(2.34)	2.12(c-d)*
Family Income	47	28.34(12.33)		4.34(1.92)	
7 Economic Status					
Low Middle Class	83	31.96(14.89)	2.30(a-b)*	5.27(2.17)	2.14(a-b)*
Middle Class	142	27.47(13.62)	0.73(b-c)@	4.62(2.21)	0.49(b-c)@
Above Middle Class	15	24.80(13.35)		4.33(1.87)	
8 Marital Status					
Single	08	26.75(8.37)	0.72(a-b)@	3.87(2.16)	1.94(a-b)*
Widowed	78	30.87(15.76)	1.48(b-c)@	5.35(2.04)	2.46(b-c)**
Married	154	27.94(13.35)		4.61(2.22)	

*Significant at 0.05 level; **Significant at 0.01 level, @not significant

The obtained data was analysed to meet the objectives of the study (vide Table 2), the results related to ADLs show that the mean in different sub-groups is as follows: the age group wise the means are as follows: 60-65 (M=25.59); 66-70 (M=26.53); 71-75 (M=33.94) and the t-values a-b (0.55), b-c (2.68). The sub-group differences between 66-70 and 71-75 years are statistically significant (t=2.68). The gender-wise data shows that the performance (M=29.00) compared to the female subjects (M=28.70) and the t-value (0.16) is not statistically significant. For the Education group, the means are as follows: No Formal

Education (M=29.51), Primary Education (M=29.18), High School Education (M=23.64), College Education (M=3.50), and the t-values a-b (0.15), b-c (1.98), c-d (1.61). The sub-group differences between primary education and high school education are statistically significant ($t=1.98$). The family status sub-group shows that the mean for the Joint family subjects is reported high ADL performance (M=29.58) compared to the nuclear family subjects (M=28.40) and the t-value (0.63) is not statistically significant. The Locality-wise data shows that the subjects from Urban (M=30.17) areas reported high ADL performance compared to those who are from Rural (M=27.89) and the obtained t-value ($t=1.23$) is not statistically significant. The Income source Group wise the means are as follows : Salary (M=31.47), Pension (M=28.90), Savings (M=26.89), Family Income (M=28.34), and the t-values a-b (0.73), b-c (0.62), c-d (0.46). The sub-group differences between Salary, pension, Savings, and Family Income are not statistically significant. For the Economic status Group, the means are as follows : Low Middle Class (M=31.96), Middle Class (M=27.47), Above Middle Class (M=24.80), and the t-values a-b (2.30), b-c (0.73). The sub-group differences between Low Middle class and middle class are statistically significant ($t=2.30$). The marital status-wise means are as follows: Single (M=26.75); widowed (M=30.87); married (M=27.94) and the t-values a-b (0.72), b-c (1.48). The sub-group differences between Single, widowed, and married are not statistically significant.

The obtained data was analysed to meet the objectives of the study (vide Table. 2), the results related to IADLs show that the mean in different sub-groups is as follows: the age group-wise means are as follows: 60-65 (M=4.55); 66-70 (M=4.51); 71-75 (M=5.34) and the t-values a-b (0.08), b-c (2.11). The sub-group differences between 66-70 and 71-75 years are statistically significant ($t=2.11$). The gender-wise data shows that

the mean for the Female subjects is reported high IADLs ($M=5.14$) compared to the Male subjects ($M=4.54$) and the t -value (2.136^*) is statistically significant. For the Education group, the means are as follows: No Formal Education ($M=5.32$), Primary Education ($M=4.18$), High School Education ($M=3.60$), College Education ($M=5.50$), and the t -values a-b (3.56), b-c (1.33), c-d (2.77). The sub-group differences between no formal education and primary education are statistically significant ($t=3.56$) also sub-group differences between High school education and College education are statically significant ($t=2.77$). The family status sub-group shows that the mean for the Joint family subjects reported high IADLs ($M=4.96$) compared to the Nuclear family subjects ($M=4.75$) and the t -value (0.74) is not statistically significant. The Locality-wise data shows that the subjects from urban ($M=5.50$) areas reported high cognitive functioning compared to those who are from rural ($M=4.34$) and the obtained t -value ($t=4.17$) is statistically significant. The Income source group the means are as follows: Salary ($M=4.95$), Pension ($M=4.88$), Savings ($M=5.52$), Family Income ($M=4.34$), and the t -values a-b (0.13), b-c (1.22), c-d (2.12). The sub-group differences between Savings and Family Income are statistically significant ($t=2.12$). For the Economic status group, the means are as follows: Low Middle Class ($M=5.27$), Middle Class ($M=4.62$), Above Middle Class ($M=4.33$), and the t -values a-b (2.14), b-c (0.49). The sub-group differences between Low middle class and Middle class are statistically significant ($t=2.14$). The marital status-wise means are as follows: Single ($M=3.87$); widowed ($M=5.35$); married ($M=4.61$) and the t -values a-b (1.94), b-c (2.46). The sub-group differences between Single and widowed are statistically significant ($t=1.94$) also sub-groups between widow and married are statistically significant ($t=1.94$).

Table 4

Means, S. D's and 't' value related to DISABILITY (PBADLs & SPD) in Different Subgroups

S. No.	Sub-Group	N	Disability–Coordination		Disability–SPD	
			Mean (σ)	t	Mean (σ)	t
1	Age					
	60-65	100	14.94 (7.79)	0.75(a-b)@	11.52(3.80)	1.28(a-b)@
	66-70	52	15.94(7.77)	1.43(b-c)@	12.40(4.39)	1.96(b-c)*
	71-75 Above	88	21.19(13.88)		13.96(4.68)	
2	Gender					
	Male	126	16.50(8.89)	1.43@	12.34(4.49)	0.96@
	Female	114	18.50(12.52)		12.89(4.27)	
3	Education					
	No Formal Education	134	19.21(11.86)	2.30(a-b)*	13.63(3.80)	2.28(a-b)*
	Primary Education	64	15.39(8.68)	1.49(b-c)@	12.18(4.82)	2.85(b-c)**
	High School Education	28	12.57(7.35)	2.54(c-d)**	9.17(4.22)	1.71(c-d)*
	College Education	14	19.71(10.69)		11.57(4.30)	
4	Family Status					
	Nuclear	148	15.00 (8.0)	4.64**	12.36(4.42)	1.09@
	Joint	92	21.39(13.21)		13.00(4.32)	
5	Locality					
	Rural	139	13.69(6.39)	6.90**	12.15(4.71)	1.90*
	Urban	101	22.61(13.25)		13.23(3.83)	
6	Income Source					
	Salary	21	20.23(10.91)	0.98(a-b)@	11.95(4.01)	0.62(a-b)@
	Pension	153	17.55(11.76)	0.33(b-c)@	12.61(4.63)	1.05(b-c)@
	Savings	19	18.47(8.32)	1.39(c-d)@	13.78(4.34)	1.29(c-d)@
	Family Income	47	15.44(7.82)		12.40(3.76)	
7	Economic Status					
	Low Middle Class	83	17.77(11.67)	0.03(a-b)@	14.24(4.25)	4.01(a-b)**
	Middle Class	142	17.83(10.58)	2.07(b-c)*	11.90(4.18)	3.49(b-c)**
	Above Middle Class	15	12.06(15.49)		10.20(4.52)	
8	Marital Status					
	Single	08	16.37(7.06)	0.56(a-b)@	13.25(6.43)	0.40(a-b)@
	Widowed	78	18.92(12.55)	1.43(b-c)@	13.94(4.40)	3.49(b-c)**
	Married	154	16.75(9.94)		11.89(4.12)	

*Significantat0.05level, **Significantat0.01level, @notsignificant

The obtained data was analysed to meet the objectives of the study (vide Table. IV), the results related to Coordination show that the mean in different sub-groups is as follows: the age group-wise means are as follows: 60-65(M=14.94); 66-70(M=15.94); 71-75(M=21.19) and the t-values a-b(0.75), b-c(1.43). The sub-group differences between 66-70, 66-70, and 71-75yrs are not statistically significant. The gender-wise data shows that the mean for the Female subjects is reported high PBADL performance (M=18.50) compared to the male subjects (M=16.50) and the t-value (1.43) is not statistically significant. For the Education group, the means are as follows: No Formal Education (M=19.21), Primary Education (M=15.39), High School Education (M=12.57), College Education (M=19.71), and the t-values a-b (2.30), b-c (1.49), c-d (2.54). The sub-group differences between No Formal Education and Primary Education are statistically significant (t=2.30) also High School Education and College education are statistically significant (t=2.542). The family status sub-group shows that the mean for the Joint family subjects reported high PBADL performance (M=21.39) compared to the Nuclear family subjects (M=15.00) and the t-value (4.647) is statistically significant. The Locality-wise data shows that the subjects from Urban (M=22.61) areas reported high PBADL performance compared to those who are from Rural (M=13.69) and the obtained t-value (t=6.90) is statistically significant. The Income source group the means are as follows: Salary (M=20.23), Pension (M=17.55), Savings (M=18.47), Family Income (M=15.44), and the t-values a-b (0.98), b-c (0.33), c-d (1.39). The sub-group differences between Salaries, pension, Savings, and Family Income are not statistically significant. The Economic status group the means are as follows: Low Middle Class (M=17.77), Middle Class (M=17.83), Above Middle Class (M=12.06), and the t-values a-b (0.03), b-c (2.07). The sub-group differences between Middle class and above middle class are statistically significant (t=2.07). The marital status-wise means are as follows: Single (M=16.37); widowed (M=18.92); married (M=16.75) and the t-values a-b (0.56), b-c

(1.43). The sub-group differences between Single, widowed, and married are not statistically significant.

The obtained data was analysed to meet the objectives of the study (vide Table. IV), the results related to SPD show that the mean in different sub-groups is as follows: the age group-wise means are as follows: 60-65 (M=11.52); 66-70 (M=12.40); 71-75 (M=13.96) and the t-values a-b (1.28), b-c(1.96). The sub-group differences between 66-70 and 71- 75 years are statistically significant (t=1.96). The gender-wise data shows that the mean for the Female subjects is reported high SPD(M=12.89) compared to the Male subjects (M=12.34) and the t-value (0.96) is not statistically significant. For the Education group, the means are as follows: No Formal Education (M=13.63), Primary Education (M=12.18), High School Education (M=9.17), College Education (M=11.57), and the t-values a-b (2.28), forb-c (2.85), c-d (1.71). The sub-group differences between no formal education and primary education are statistically significant (t=2.28), also sub-group differences between primary Education and High school education are statistically significant (t=0.85) and High School Education and College education are statically significant (t=1.71). The family status sub-group shows that the mean for the Joint family subjects is reported high SPDL (M=13.00) compared to the Nuclear family subjects (M=12.36) and the t-value (1.09) is not statistically significant. The Locality-wise data shows that the subjects from urban (M=13.23) areas reported high cognitive functioning compared to those who are from rural (M=12.15) and the obtained t-value (t=1.90) is statistically significant. The Income source group the means are as follows: Salary (M=11.95), Pension (M=12.61), Savings (M=13.78), Family Income (M=12.40), and the t-values a-b (0.62), b-c (1.05), c-d (1.29). The sub-group differences between Salary, Pension, Savings, and Family Income are not statistically significant. For the Economic status group, the means are as follows: Low Middle Class (M=14.24), Middle Class (M=11.90), Above Middle Class (M=10.20), and the t-values a-b (4.01), b-c (3.49). The sub-group differences between the Low

middle class and Middle class are statistically significant ($t=4.01$), also sub-group differences between the Middle class and Above Middle class are statistically significant ($t=3.49$). The marital status-wise means are as follows: Single ($M=13.25$); widowed ($M=13.94$); married ($M=11.89$) and the t -values a-b (0.40), b-c (3.49). The sub-group differences between Single and widowed are not statistically significant ($t=0.40$) also sub-groups between the widow and married are statistically significant ($t=3.49$). Similar findings were reported in earlier studies carried out by Gupta, *et al.*, (2009); Balamurugan & Ramathirtham, (2012); and Ghosh & Singh, (2014), where more women reported having difficulty in vision as well as in hearing. Similar results were also reported by Dey (2009) where it was found that visual disability was the most frequently perceived disability, followed by difficulty in chewing, walking, and hearing in that order.

Table 5

Correlation Matrix related to Socio-demographic variables and Disability

S. No.	Variables	Disability			
		ADLs	IADLs	PBADLs	PAD
	Socio-demographic				
1.	Age	0.260**	0.157**	0.254**	0.246**
2.	Gender	0.11	0.137*	0.093	0.062
3.	Education	0.053	0.174**	0.134*	0.274**
4.	Family Status	0.041	0.048	0.288**	0.070
5.	Locality	0.080	0.261**	0.409**	0.122
6.	Income Source	0.47	0.076	0.098	0.018
7.	Economic Status	0.165*	0.47*	0.073	2.85**
8.	Marital Status	0.066	0.088	0.068	0.198**

*significant @0.01 level; ** significant @ level; @- Not significant

The correlation matrix related to Functional competence in ADLs shows that Age ($r=0.260$), Economic Status ($r=0.165$) were significantly associated. The other socio-demographic variables like

Gender ($r=0.11$), Education ($r=0.053$), Family status ($r=0.041$), Locality ($r=0.080$), Income source ($r=0.47$) and Marital status ($r=0.066$) were not significantly associated. Result related to physical competence in IADLs shows that Age ($r=0.157$), Gender ($r=0.137$), Education ($r=0.174$), Locality ($r=0.0261$), Economic Status ($r=0.47$), was significantly associated. The other socio-demographic variables like Family status ($r=0.048$), Income source ($r=0.076$) and Marital status ($r=0.088$) were not significantly associated. Result related to physical competence in PBADLs shows that Age ($r=0.254$), Education ($r=0.134$), Family status ($r=0.288$), Locality ($r=0.409$) was significantly associated. The other socio-demographic variables like Gender ($r=0.093$), Income source ($r=0.098$), Economic Status ($r=0.073$) and Marital status ($r=0.068$) were not significantly associated. Results related to physical competence in PAD shows that Age ($r=0.246$), Education ($r=0.274$), Economic Status ($r=2.85$) and Marital status ($r=0.198$) was significantly associated. The other socio-demographic variables like Gender ($r=0.062$), Family status ($r=0.070$), Locality ($r=0.122$) and Income source ($r=0.018$) were not significantly associated.

Studies from western population also indicate that Educational level is one of the indicators of cognitive reserve, which influences the manifestation of symptoms of cognitive impairment (Lojo- Seoane, *et al.*, 2012). People with low education theoretically display a steeper cognitive decline early in the process of aging compared to those with high level of education. (Murayama, *et al.*, (2019) findings might indicate that confounders such as the passion for cognitive activity and strong district-level social network may buffer the relationship between low education and cognitive impairment. Lifelong single individuals are those who live alone and lack the necessary emotional support, thus more negative emotions, such as loneliness and depression, may be elicited. Unmarried individuals also showed lower social engagement, as well as the availability of socio psychological resources, which could affect cognitive health and constitute a risk factor for cognitive decline (Sommerlad, *et al.*, 2018).

The data about Functional competence shows that subgroups differed significant related to mobile addiction.

Table 6

Correlation Matrix relates to Cognitive Status and Disability

S.	Variables	Disability			
No.		ADLs	IADLs	PBADLs	PAD
	Cognitive status-MMSE	0.149*	0.185**	0.267**	0.295*

*significant @0.01 level; ** significant @ level; @- Not significant

The association between Cognitive Status and disability is seen in Table 6. In the Disability 4 sub-factor, ADLs ($r=0.149$), IADLs ($r=0.185$), PBADLs ($r=0.267$), and PAD ($r=0.295$) are statistically significant with MMSE.

The data about Cognitive status differed significantly related to the subgroups of Functional competence namely ADLs, IADLs, PBADLs, and PAB.

This finding was supported by previous studies. Seeman, *et al.*, (1993) found that cognitive performance in men was associated with self-efficacy beliefs but not in women. Kim, *et al.*, (2005) identified several predictors of depression, including living arrangement (living alone versus living with family/spouse); having chronic conditions such as diabetes, arthritis, digestive disorders, or chronic bronchitis; years of education; and cognitive impairment. Adults with higher educational backgrounds and who work in highly cognitively stimulating jobs will possess high cognitive abilities in comparison to people with low levels of education. Even people who have a higher level of education and highly cognitively stimulating jobs will face a decline in their cognitive functioning but much slower than adults who have a low education background and cognitively stimulating occupations. Previous Studies indicate that socioeconomic status and prior life experiences have a major influence on the decline of cognitive abilities in the later stages of life (Lalitha & Jamuna, 2015).

Consistently, less education profoundly correlated with poorer performance of the MMSE and MoCA, showing a significantly increased trend of MMSE / MoCA scores with high education in this study. The results supported the findings of better performance on MoCA for those with 6 years and more education compared to those with less than 6 years of education (Din, *et al.*, 2016). However, a recent investigation of older Americans revealed that divorced and widowed status had a significant negative impact on cognitive function (Lam, *et al.*, 2019). This result was not reflected in the Xu, *et al.*, (2021). Study and one explanation for this discrepancy was that the effect of marital status on cognitive function might be moderated by other factors. Therefore, the association between marital status and cognitive function in older people should be further explored.

Conclusion and Suggestions

- Cognitive impairment is very common in old age and the nature of impairment varies from one person to another person. Functional competence involves carrying out different activities that are task-specific and co-morbid conditions could affect the disabilities differently. Understanding these heterogeneities helps future research related to the role of cognitive impairment in carrying functional competence.
- The present study's results are similar to the empirical generalization that there is a relationship between cognitive impairment and functional competence. These findings highlight the need for effective rehabilitation and psychological intervention services to help non-institutionalized older adults improve or maintain their functional independence. Remedial training of both IADL and ADL tasks as required and traditional rehabilitation training that focuses on a limited subset of these tasks (e.g., preparing meals, mobility).

The findings of this study might be informative to health policymakers to develop new policies to increase functional activity for the elderly in home settings in the local context. Also, the future researcher can get insight into conducting mixed-method research in the health field concerning geriatric people.

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Dispositional Hope, Affect States, and Life Satisfaction of Financially Dependent and Financially Independent Elderly

Rashmi Mishra

Department of Psychology P.P.N. College, Kanpur (U.P.)

ABSTRACT

The objective of the present study was to see whether financially dependent and financially independent 120 elderly, ages varying from 70 years and above, differ significantly on three personality traits: Dispositional Hope, Affect States, and life satisfaction. Out of these 120 male elderly respondents, 60 were financially dependent and 60 were financially independent of their family members. For measuring Dispositional Hope, Affect States, and Life Satisfaction, Hindi translation of AHS (Adult-Hope Scale), Positive Affect and Negative Affect Scale (PANAS, David Watson 1988), and Life Satisfaction scale were used respectively. The results indicate that financially independent elderly are higher on these parameters of dispositional hope, positive affect, and Life Satisfaction as compared to their counterparts who were financially dependent upon their family members. Whereas the negative affect state was pre-dominant in financially dependent elderly than financially independent ones.

Keywords : Financially Dependent, Financially Independent, Dispositional Hope *Affect States*, Life Satisfaction, Elderly

Hope and Affect states are predictive of physical and mental health. Hope is goal-directed thinking in which a person has the perceived capacity to find routes to desired goals (pathway thinking) and the requisite motivations to use those routes (agency thinking). Consequences of Hope in life are joy and happiness in information processing, higher life expectancy, reduced fear, stress, and anxiety regarding the future and ultimate result, increased decision-making power, and social participation. Hope gives meaning to life and prevents one's psychological collapse during the emergence of difficulties and crises in life. Hopeful elderly persons are healthier and happier. Their immune systems work better. They cope better with stress using more effective coping strategies such as reappraisal and problem-solving. They also actively avoid stressful life events and form better social support networks around themselves. Financial independence secures them from fears of becoming a burden upon others. Satisfaction was more a product of attitude than the attributes a person holds. Affect is a person's immediate, physiological response to stimulus and it is typically based on an underlying sense of arousal.

Seligman (2002), describes the effect of happiness on creativity, productivity, and longevity. Happiness classifies positive emotions into three categories-those associated with the past, the present, and the future. Positive emotions associated with the future include optimism, hope, confidence, faith, and trust. Satisfaction, contentment, fulfillment, pride, and serenity are the main positive emotions associated with the past. A few other variables are also significant predictors of happiness and life satisfaction as self-efficacy (Rao & Mehrotra 2006), and optimism (Puri & Nathawat 2008).

The problem of financially dependent elderly has become acute after the breakdown of the joint family system in our country. In a joint family, every member had social and financial security. Even if an elderly became incapable of earning, the headman (Mukhiya or karta) had full rights in the decision making even in financial matters. The breakdown of the joint family system was due to the impact of industrialization, urbanization, westernization, and education. Older

persons suffer from a lot of physical, social, emotional, and financial problems like indignity, disgracefulness, embarrassment, dishonor, disheartening, disregard, indifference, injustice, lack of care, and psychological torture, most negative behaviours and attitudes are reflected in the society towards elderly, passive acceptance, helplessness and depression are associated with worse adaptation and lower survival in elderly. Many elderly people are isolated because of loss of physical or mental capacity or the loss of friends and family members. Socio-cultural factors like erosion of the bonds between generations of a family, system of inheritance, and land rights, affect the distribution of power and material goods within families.

Financially insecure old people expect social security, and free health care, so that, they can lead a comfortable and respectable life. At the same time, older people who have sound financial conditions look forward to risk-free investment schemes so that they can earn good returns to meet their financial needs in old age. To make life comfortable and respectable older persons need coverage existing and/or new social security schemes, life and medical insurance for longer years, covering properties, movable/ immovable.

The above scenario is found to be most pronounced in the case of the elderly who are financially dependent upon other family members. However, it is found that the elderly who are financially independent do not face such adverse consequences. Financially dependent elders from low S.E.S. report problems of poor health, feelings of stress and strain, fear of getting a bad temper, ideas of worthlessness, hopelessness, lack of worth in living, and suicidal ideas. Mishra and Ranjan (2006) conducted a study on 120 elderly (all males) in the age range of 65–75 years. The results indicate that financially independent elderly were significantly higher in life satisfaction as compared to their financially dependent counterparts. Financially dependent elderly need social and economic support, poor self-image, have a sense of anxiety and insecurity, and often face humiliation and insult by their children. Another study conducted by Mishra Rashmi, and RanjanPratibha (2011) indicates that financially

independent elderly are higher on psychological, social, emotional, and total well-being than their financially dependent counterparts. This shows that financially independent elderly are higher on self-acceptance, self-esteem, social acceptance, personal growth, personal worth, and social worth as compared to financially dependent elderly.

Keeping in view the above findings the objective of the present study was to see whether financially dependent and financially independent elderly differ significantly on Dispositional Hope, Affect States (Positive and Negative), and Life Satisfaction. It was hypothesized that the financially independent elderly differ significantly in total Hope, Affect State, and Life Satisfaction scores than their financially dependent counterparts. In other words, financially independent elderly are likely to be higher on Hope, Positive Affect State, and life satisfaction as compared to their financially dependent elderly. While financially dependent are higher on negative affect state than their financially independent counterparts.

Method

Sample

The present study was conducted on a sample of purposively selected 120 senior citizens (all males) in the age group of 70 years and above. Out of these 120 respondents, 60 were financially independent and 60 were financially dependent upon their family members.

Tools Used

For measuring dispositional hope Hindi translation of the Adult-Hope Scale (AHS), developed by Snyder, *et al.*, (1991), was administered to the respondents of this study. AHS has 12 items and scoring is done on eight points ranging from definitely false to true. The minimum score is 12 and the maximum score is 96 on this scale. Higher scores indicate a higher level of hope and vice versa. For measuring affect states Positive Affect and Negative Affect Scale (PANAS), developed by David Watson (1988), has 20 items by way of words indicating positive and negative affect, 10 words indicate positive

affect and 10 words indicate negative affect. The scoring is done on 5 points ranging from very slightly or not at all to extremely. The scores ranged between 10 and 50 On positive states, similarly, the scores on negative affect state also ranged between 10 and 50. The Life Satisfaction Scale (LSS), developed by *Singh (2018)*, has eleven items. Items are rated on a 7-point scale. The possible score of each item ranges from 1 to 7. The maximum possible scores will be 77 and the minimum 11. Individuals having scores 61 and above may be placed in high life satisfaction whereas individuals having scores 28 to 60 may be placed in moderate life satisfaction. Individuals scoring 11-27 may be placed in low life satisfaction.

Results

Table showing Means, SDs, and t- Values of Dispositional Hope, Affect States (Positive, and Negative), and Life Satisfaction of Financially Independent, and Financially Dependent Elderly

Variables	Financially Independent			Financially Dependent				
	N	Means	SDs	N	Means	SDs	t-Value	S OR NS
Hope	60	53.17	14.76	60	31.52	12.97	8.64	S *
Positive Affect	60	37.81	11.22	60	27.12	9.53	5.72	S*
Negative Affect	60	26.22	9.19	60	48.53	14.35	10.52	S*
Life Satisfaction	60	52.35	17.51	60	35.72	14.17	6.18	S*

*significant at .01 level

The perusal of the above table shows that Hope scores of financially independent elderly have a Mean score of 53.17 with a SD of 14.76 while financially dependent elderly have a mean score of 31.52; SD=12.97; t=8.64 significant at .01 level. This further shows that financially independent elderly are more hopeful than those who are financially dependent. Many studies evince that Hope and Optimism are important factors in successful ageing. Studies also evince that respondents high on Hope also have a higher self-esteem.

The perusal of the above table shows that the positive affect states of the financially independent elderly over the past week were significantly better than financially dependent elderly (Means=37.81 & 27.12; SDs=11.22 & 9.53; $t=5.72$). PANAS also measures negative affect states over the past week. Financially dependent elderly experience negative affect states significantly more than their counterparts who were financially independent. (Means=48.53 & 26.22; SDs=14.35 & 9.19; $t=10.52$).

The positive affect state is associated with happiness contentment and satisfaction with life, on the other hand negative affect state is associated with sadness, discontentment, unhappiness, and lack of interest in life.

The perusal of the above table shows that financially independent elderly are higher on life satisfaction than financially dependent elderly (Mean = 52.35 & 35.72; SD= 17.51 & 14.17; $t=6.18$ significant at 0.1 level)

Discussion

The main finding of the present study was that Financially Independent elderly are found to be higher on dispositional hope, Positive affect states, and life satisfaction as compared to financially dependent ones, who are found to be low on these parameters. Financially dependent ones are higher on negative affect states. This may be due to the drastic change in the value system of the people from altruistic to individualistic and from spiritualistic to materialistic. This change is caused by Westernization, Industrialization, Urbanization, and Education.

Financially dependent elderly face a lot of mental health problems like neglect, elderly abuse, humiliation, and many others particularly after the breakdown of the Joint family system. Government has taken some social and financial security measures to enhance their self-esteem.

Most of the state governments are paying the destitute elderly pensions ranging from one to two thousand rupees per month to enable their ends meet. Financially independent elderly may also suffer from mental health problems. Loneliness is a major problem for the

elderly. In today's busy life for earning a decent living, nobody has time to spend with their parents. Even the grandchildren who had earlier been a good source of company to their grandparents find no time to spend with them. To build the future careers of their children, parents are motivated to send them to pre-schools even at the very tender age of 2+Loneliness may cause non-use of cognitive functions which may result in mental disorders like Alzheimer and Dementia.

Saksena (2022), gave the following few tips for successful ageing:

1. Sound physical and mental health depends partially on the way a person takes care of and partially on circumstances
2. Financial independence. This also depends partially on the person how prudently savings and investments are done for the future and partially circumstantial
3. Meaningful engagement. This is absolutely in the hands of the person during old age a person must be engaged in meaningful activities This will enable the elderly to use cognitive functions
4. Activity
5. Mobility

The director of George Washington Medical University (US) in a recent report pointed out that a person is most creative after attaining the age of 65. Thus, the elderly should not be perceived as a burden on the family. They may be a great asset to the nation.

Life satisfaction is the way a person perceives how his life has been and how they feel about where it is going in the future. The cognitive component is associated with life satisfaction and satisfaction with various life domains. (Pavot & Diener, 1993). Life satisfaction is a subjective evaluation of one's life as a whole. It refers to the degree to which one feels that life is rich and meaningful and this feeling is valued higher compared to the standard of life being lived. The higher life satisfaction, the better the individuals adjust to it. In old age life satisfaction can be used to evaluate whether one's life has been successful overall. It can also be an indicator of adaptation to various changes and the reality of Ageing. Life satisfaction in old

age is related to health status, economic status, social participation social relationships, and living environment. Elderly people living in an environment with less tension and more individual choices have shown higher life satisfaction than those who do not. A pleasant living environment improves life satisfaction in old age. Satisfaction with life is a kind of general and deep inner happiness. That emanates from individual experience in the outside world. The life satisfaction of the elderly is the key to subjective well-being and healthy Ageing.

Successful ageing depends upon two types of coping strategies i.e. preventive approach and corrective approach. In the corrective approach, an older person may use two types of coping- 1. Adoptive coping refers to acceptance, hope, change in perception, redefinition of self-avoidance, dropping responsibilities, prayer, and less fear for life and death and, 2. Active coping refers to exercise, education, social interaction, getting busy, rest when needed, medication, therapy, and good living. Some studies evince that longevity is also associated with happiness and positive affect states which are important in successful ageing. Successful ageing is associated with productivity, creativity, and longevity.

The findings of the present study may be utilized by mental health personnel, enhancing the quality of mental health of the elderly in our country. It is worth mentioning here that the population of elderly is on the increase and they need to have a better quality and satisfaction of life, to promote their mental health. Again needless to say that there is a close relationship between mental health and physical health. If the elderly of our country have better mental health they are also likely to have good physical health – so important for successful ageing.

- Elderly persons may invest in knowledge that pays the best interest.
- Elderly persons should dedicate themselves to constant learning at least 5 hours per week.
- Elderly persons can master the new knowledge economy by adopting six essential skills to master the new knowledge economy are given below-1. By identifying valuable knowledge at the right time 2. By learning and mastering

that knowledge quickly understanding and using the mental model. 3. By communicating the value of skills to others “multiplier skill”. 4. by converting knowledge into money and results. 5. By learning how to financially invest in learning to get the highest return. 6. By mastering the skill of learning new skills.

An older person may start such kinds of rituals by adopting three steps- Firstly, they should find the time for reading and learning even if they are really busy and over-worked. Secondly, they should stay consistent in using that finding time without procrastinating is a good practice. Thirdly, they should increase the results they receive from each hour of learning by using proven hacks that help them remember and apply what they learn.

During an active service/professional/business career an elderly is bound by certain rules regulations and protocols. He/she is supposed to use the left brain more than the right one. After retirement from active professional engagement, the elderly are free to act according to his/her will. His/Her creativity which was suppressed during professional career comes to the fore front and thus becomes more creative. Since his brain become plastic, he uses the right brain more. The right brain is more creative also.

Conclusion and Suggestions

The elderly who are more hopeful see others as supporting sources on which they can rely, they adapt to challenges they might confront in life, experience higher levels of happiness, and are more satisfied with their life. Positive affect state is associated with happiness contentment and satisfaction with life on the other hand negative affect states are associated with sadness, discontentment, unhappiness, and lack of interest in life.

1. In some further studies gender differences in positive mental health variables like hope, affect state, life satisfaction, quality of life, subjective well-being, self-esteem, helplessness, and feeling of dignity may be studied.
2. Difference between institutionalized and non-institutionalized elderly on the above variables may also be studied.

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Digitalisation of Welfare Programmes and its Effective Delivery to Older Adults: A Case of DBT in PDS at Puducherry

*Dilip Diwakar, G., Nitin Tagade¹, Austin Sinesh Das²,
Renjith R. Pillai³, and Neathravathi⁴*

School of Social Work, IGNOU, New Delhi

¹School of Economics, University of Hyderabad, Telangana

²Department of Social Work, Central University of Kerala, Kasaragod

³DDTC, Department of Psychiatry, PGIMER, Chandigarh- 160012

⁴Department of Social Work, Anna Adarsh College for Women, Chennai

ABSTRACT

This study was conducted to find out the effectiveness of the Direct Benefit Transfer (DBT) Programme in satisfying older adults' food needs. For this purpose out of about 377 Public Distribution System (PDS) shops only 20 shops, 10 from urban areas and 10 from rural areas were selected for this study. From each shop 8 older adult respondents, a total of 160, were selected randomly for data collection. However, 8 respondents were omitted because of a lack of required data, and therefore, a total of 152 elderly respondents were finally selected for the study. An interview schedule was used for data collection. The study revealed that rural older adults have higher odds of preference for food rations as compared to urban counterparts. Scheduled caste older adults have higher odds of preference for food rations as compared to 'other' categories. The daily wage labour has higher odds of preference for food rations as

compared to other job categories. These findings stress a careful policymaking is required on food security concerns of older adults.

Keywords: Older adults, Food Security, Direct Cash Transfer, Digitalisation, Welfare Programme, Direct Benefit Transfer (DBT) Programme, Public Distribution System (PDS)

Social status of older adults is not good as per many studies. In fact, 33 per cent of the older adults in India live in poverty which is much higher than the aggregate poverty level in India (Kumar, *et al.*, 2019). Since they have worked very hard all through their life and contributed to the economic and social development of the country, it becomes the family and government's responsibility to take care of them when they become old.

Food Security and malnutrition is another major concern in India. In India, one-third of the children are undernourished, and this problem is prevalent among older adults too. The malnutrition among older adults in India is 18.3 per cent, and the risk of malnutrition is more than half. In gender-wise classification, malnutrition and the risk of malnutrition among males are 14.8 per cent and 42.4 per cent respectively, and females are 16.7 per cent and 46.9 per cent. In area-wise assessment, malnutrition and risk of malnutrition are 17.7 per cent and 48.6 per cent in rural areas and 19.3 per cent and 48.5 per cent in urban areas, respectively (Kushwaha, *et al.*, 2020). Malnutrition is one of the major problems that develop among older adults due to excess or imbalances in energy intake or nutrients (Morley, 2018). The major factors influencing the nutritional status of older adults in India are declined physical activity, frailty, constipation, cognitive decline, dementia, poor appetite, eating dependencies, loss of interest in life, and difficulty in swallowing (Favaro-Moreira, *et al.*, 2016).

Another major problem is depression in older adult people (Vafaei, *et al.*, 2013). The lack of food supply is directly associated with negative emotions, such as anxiety, and depression, and indirectly associated with anger management (Paquet, *et al.*, 2003). Thus, studying the food availability among older adults is essential to understand their problems.

To address these problems, both central and state governments initiated various schemes and programmes even though the spending is minimal viz., 1 per cent of India's GDP (Choolayil & Puthran, 2018). Schemes include the general one designed for the whole society in

which the older adults also benefit and the specific one developed for the well-being of old people. The major schemes for older adults are National Pension Schemes for financial assistance, Public Distribution Systems for nutritional improvement, MNREGA for employment generations, etc. The government has recently decided to revamp the welfare schemes by bringing the latest technology called digitalisation (Kumar, *et al.*, 2019). Direct benefit transfer (DBT) emerged as the high priority and focus of the government. It was believed that it would reform the government delivery system by making it simple and faster, ensuring accurate targeting of beneficiaries, de-duplication, and reduction of fraud (Sengupta, D., n.d). This will bring accountability, transparency, better monitoring, and evaluation as part of good governance. It was believed that the transfer of pensions and other benefits to older adults through DBT would be efficient and effective.

This study checks the effectiveness of the DBT system in satisfying older adults' food needs. This will help identify the need for a DBT system by assessing its effectiveness in a vulnerable section, viz. older adults of Puducherry.

Methodology

In Puducherry, Chandigarh, Dadra, and Nagar Haveli the government of India has piloted the direct cash transfer (DBT) in Public Distribution System (PDS). Though the pilot was initiated in 2015, there is a paucity of studies evaluating the effectiveness of the implementation of Direct Benefit Transfer (DBT) in PDS. Therefore, this study was carried out to examine the effectiveness and efficiency of DBT in addressing the food security concerns of older adults. The study used an exploratory research design. The objective of the study was to examine the functioning of the DBT programme in Puducherry, older adults' awareness and knowledge of this programme, their preferences vis-a-vis rations vs DBT, and examine the factors determining their choices of preference.

Puducherry has 1.33 lakh cardholders benefitting from the DBT. There are about 377 PDS shops in Puducherry, from the Department of Civil Supplies and Consumer Affairs the beneficiary list was collected. About 20 shops, 10 from urban areas and 10 from rural areas were selected randomly for this study. From each shop, 8 older adult respondents were randomly selected. A total of 160 respondents

were selected. However, 8 respondents were omitted because of lack of required data and a total of 152 respondents were finally interviewed. An interview schedule was used for data collection.

Findings

i) Socio-demographic characteristics of the respondent

The information on socio-demographic characteristics such as education, caste, gender, occupation, geographical location, and income of the respondents were collected. Of this, about 42 per cent of the respondents are male and 58 percent of the respondents are female, which ensures a good representation of both genders. To understand the viewpoints of respondents from different caste categories the study had 23 percent of Scheduled caste (SC), 43 per cent Most Backward Class, and 33 per cent Backward class respondents. The study did not capture the perspectives from the General Class, as their population is very minimal in Puducherry, moreover, their representation in BPL family is also negligible. Among the older adults about 70 per cent of the respondents are in the age group of 61-70 years and the remaining are above 70 years. While looking at their household primary occupation about 47 per cent were pensioners, 39 per cent were casual daily wage labours and 14 per cent were privately salaried. The family income of the household shows the majority 57 per cent have a family income was less than Rs. 5000, about 37 per cent earn Rs 5001-10000, and the remaining 9 per cent earn Rs.10001-15000.

ii) Preference of scheme among older adults

The respondents had a choice to take food ration from the fair price shop (FPS)/ Ration shop or to receive direct cash transfer so that they can procure the food ration from the open market. The data shows about 76 per cent of the respondent preferred to procure ration from the fair price shop and about 24 per cent preferred direct cash transfer to procure from open market. When explored further on the reasons for preferring ration from fair price shop, about 98 per cent of the respondents said since they receive the food ration at free of cost they prefer it and only 2 per cent said it saves their time. When they were asked which scheme ensures food security, the majority 64 per cent said food ration from fair-price shop and about 36 per cent said even the direct benefit transfer can also ensure food security. The data also shows as the age increases that there is a marginal increase in the

preference towards taking ration from fair price shops, the respondent between 61-70 years is 75.5 per cent and above 70 years 76.1 per cent.

iii) Access to bank and ATM to avail of the cash benefit

The data shows only 15 respondents that is 10 per cent of the respondent are using the ATM to take the money and the remaining 90 per cent of the respondents are majorly dependent on the bank to withdraw the money. Apart from 39 per cent of the respondents remaining have to travel more than 1-5 km to reach the nearest bank, about 16.5 per cent of the respondents even said that they spend around Rs. 10-50 to reach the bank. The respondents said only 49 per cent visit the bank only once to take the money and the remaining have to visit multiple times to the bank. About 51 per cent of the respondent said that they spent half a day doing the transactions and the remaining spent more time in the bank during their visits. From the data, it is very clear that even though they have many difficulties in accessing and utilising the bank facilities but even then they prefer to go to the bank rather than using the nearest ATM, this could be because of a lack of confidence in using the ATM. If they have been given basic training in using the ATM that will be helpful for them.

iv) Factors determining their choice of scheme

In the policy-making process, understanding the variables which play an important role in decision-making is crucial. It helps to identify the factors responsible for the choice of scheme. Moreover, it informs the policymakers to scale up the programme and to address the gaps and deficiencies in the programme. It also helps to create good public opinion on the programme and to improve its efficacy. A chi-square test was administered to understand the relationship between variables and their significance in the decision-making process.

The result of Table 1 shows, when the data was disaggregated based on place of residence about 90 per cent of the respondents in the rural area as compared to only 62 per cent of the urban area are in favour of receiving ration from the fair price shop. The Chi-square result shows the X^2 value is 15.754, the p-value is <0.01 , which is significant at a 1 percent level. It clearly indicates that there is a relationship between the place of residence of the respondent and the preference of the scheme.

The occupation of the respondents shows about 86 per cent of the respondents of daily wage labour, 74 per cent of the pensioners, and 52 per cent of the private salaried prefer ration from fair price shops. The Chi-square result shows the X^2 value is 10.064, and the p-value is < 0.01 , which is significant at the 1 percent level. It clearly indicates that there is a relationship between the occupation of the respondent and the preference of the scheme. Mostly the older adults engaged in daily wage labour prefer food ration from fair ration shops as compared to the private salaried person.

In the DBT scheme, the government of India has fixed Rs 133 per person for the purchase of food grains from the open market. Based on the number of family members the household will receive a cash transfer in their linked account. The data on the amount received by the respondents was categorised into families receiving less than Rs. 500 and above Rs. 500 for analysis purposes. The data shows about 53 per cent of the respondents receive Rs. 500 or less than that and the remaining 47 per cent are receiving Rs 500 and more. When the preference of respondents based on the amount received as part of DBT was checked the result showed about 84 per cent of the respondents receiving money less than 500 and 67 per cent of the respondent receiving money above Rs. 500 preferred to receive food grains from FPS. The Chi-square result shows the X^2 value is 6.005, p-value is < 0.05 , which is significant at a 5 percent level. It clearly indicates that there is a relationship between the amount received from DBT and their preference for the scheme. It is clear that respondents who are receiving more money through cash transfers prefer DBT.

The data on the caste category of the respondents shows about 89 per cent of the respondents belong to SC, 75 percent of MBC, and 66 per cent of the BC prefer to receive ration from the fair price shop. The Chi-square result shows the X^2 value is 6.213, and the p-value is < 0.05 , which is significant at a 5 percent level (Table 1). It clearly indicates that there is a relationship between the caste category of the respondent and their preference for the scheme. It shows the SC mostly preferring to take ration from the fair price shop as compared to MBC and BC.

Table 1

Beneficiaries response on scheme which ensures food security across socio-demographic variables

Variables	Categories	Scheme Preference of Beneficiary		χ^2	P Value
		Ration from Fair price shop - N (%)	Money to purchase in open market - N (%)		
Place	Rural	68 (89.5)	8 (10.5)	15.754	0.000
	Urban	47 (61.8)	29 (38.2)		
Occupation	Daily Wage Labour	51 (86.4%)	8 (13.6%)	10.067	0.007
	Pensioner	53 (73.6%)	19 (26.4%)		
	Private Salaried	11 (52.4%)	10 (47.6%)		
Amount Received from DBT	Less than Rs 500	67 (83.8%)	13 (16.2%)	6.005	0.012
	Rs. 501 and above	48 (66.7%)	24 (33.3%)		
Caste	SC	33 (89.2%)	4 (10.8%)	6.213	0.045
	MBC	49 (75.4%)	16. 24.6%)		
	BC	33 (66.0%)	17 (34.0%)		

Source : Based on the primary survey conducted during 2018-19

v) *Result of the regression analysis*

Binary logistic regression analysis is used to estimate the probabilities of association between the dependent and the independent variables. This analysis helps to predict the likelihood of an event happening. Wald test was conducted to determine the statistical significance of each of the independent variables. The statistical significance is presented in the “Sig” column. Odds ratio was presented in Exp (β), odds ratio >1 indicates higher chances of occurrence, and <1 indicates the lower chances.

A logistic regression was performed to ascertain the effect of place of residence, caste category, and occupation on the likelihood that respondents preferred food ration from FPS. The result shows rural ($p=0.001$), SC ($p=0.014$), and daily wage earner ($p=0.006$) added significantly to the prediction, and MBC and pensioner p-value is not significant. The Exp (β) shows respondents from rural areas were 5 times more likely to prefer food ration from FPS. SC respondents were 5.9 times and daily wage labour were 6 times more likely to prefer food ration from FPS (Table 2).

Table 2

Result of Logistic Regression on the preference of kind transfer in PDS shop

Category	β	S.E.	Wald	df	Sig.	Exp (β)	95% C.I. for EXP (β)	
							Lower	Upper
Rural	1.617	0.491	10.853	1	0.001	5.039	1.925	13.19
BC			6.448	2	0.04			
SC	1.774	0.719	6.088	1	0.014	5.893	1.44	24.116
MBC	0.092	0.465	0.039	1	0.844	1.096	0.44	2.728
Private Salaried			7.553	2	0.023			
Daily wage labour	1.795	0.653	7.553	1	0.006	6.021	1.674	21.661
Pensioner	1.004	0.571	3.1	1	0.078	2.73	0.892	8.354
Constant	-0.859	0.571	2.26	1	0.133	0.424		
a. Variable(s) entered on step 1: Place, Caste, Occupation.								

Source : Based on the primary survey conducted during 2018-19

Discussion and Conclusion

All their life older adults have contributed to family development and to some extent to the nation's development. Therefore, taking care of them when they get aged is the responsibility of the family members and the state. As the traditional family system has weakened, the extended family and the joint family are no longer in existence, now we can find only the nuclear family system. In the nuclear family system, the apathy is that during their old age, the older adults are left without much care and protection. Therefore, the role of the state to take care of them or provide a required support system to take care of them becomes a prerequisite.

The government of India has initiated many social welfare programmes to address the concerns of the poor and the vulnerable section including geriatric people. The public distribution system is one such initiative of the government and it has been functioning for more than 6 decades. This is very important to address the food security concerns of older adults as they face the threat of not getting 3 meals a day.

PDS programme since its inception had the problem of corruption, pilferage, delay, supply of poor-quality grain, leakage, etc. The government

has taken several measures to address these concerns in a timely manner. However, the problem existed and it affected the efficacy of the programme. Therefore, recently the government digitalised the programme and even they initiated a pilot study in 3 union territories Puducherry, Chandigarh, and Dadra and Nagar direct cash transfer (DBT) in PDS for the eligible beneficiaries.

However, it was believed that this would address the problems of corruption, pilferage, delay, supply of poor-quality grain, leakage, etc. But will it address the food security concerns of older adults and other vulnerable sections was a concern? This study explored this particular aspect and found that a majority 3/4th section of the older adults wanted the food grains rather than the money to purchase from the open market. Provisioning of food grains to older adults ensures food security concerns rather than providing money to purchase from the open market.

The logistic regression result shows higher odds for older adults from rural areas, scheduled categories, and daily wage earners to prefer the provisioning of food grains through FPS than transferring money to their account to purchase food grains from the open market. From this, it is very clear that older adults in general and especially those with multiple deprivations like place of residence, caste, and occupation prefer the food ration to direct cash transfer. In the case of cash transfer, it was reported the respondents that were not comfortable using the ATM, instead, they were going to the bank to take the money and they had to visit the bank multiple times to take the money. On each visit, they spend more than half a day doing the transaction at the bank. Therefore, they spend a lot of money traveling and spend more time doing transactions at the bank as compared to visiting the fair price shop to collect ration.

Moreover, when cash was given instead of food grains to Older adults, they might spend this money on age-related ailments and other urgent expenditures rather than on the purchase of food items. Therefore, the purpose of the PDS programme in addressing food security concerns will be at stake if they provide money to older adults. While the government and the policy makers formulate any policies and programme they should look into the concerns of the older adults especially those coming from economically weaker sections and rural areas.

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