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Measuring Age Identity in Older Persons: Development and Validation of Age Identity Measurement Scale (AIMS)

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ABSTRACT

Considering the varying levels of measurement practices of age identity in socio-behavioural sciences, the authors have developed a conceptually grounded Age Identity Measurement Scale for measuring age identity in older persons. The items retained, through two separate face validation exercises, were included in the structured interview schedule. The trained interviewers conducted face-to-face interview with randomly selected 624 older persons, aged 65 years and above, from three districts in south India. Psychometric analysis was performed upon 44-items, using 4-point Likert type rating scale. The mean age was 75.5 yrs, 61.2 per cent were women, 4.2 mean years of education and 54.6 per cent were widowed. The four factors in 24-items emerged in exploratory factor analysis: personalized social image, age identity importance, relative self-image and personalized self-image. Construct validity was supported by relationship with other scales: self-esteem, loneliness, social integration, perceived discrimination and wellbeing. The subscales' coefficient alphas range from 0.72 to 0.96 with overall coefficient alpha of 0.92. Temporal reliability for subscales ranges from 0.51 to 0.89 and overall coefficient alpha of 0.90. The four-week interval test-retest correlations range from 0.51 to 0.85 with overall correlation coefficient of 0.83. Age Identity Measurement Scale is a valid and relatively stable measure for age identity in older persons.

Key words: Age identity, Ageing, Instrument development

Identity is an ongoing process and socially constructed through public discourses. The discursive constructions of age identity occurred alongside with other identities such as gender, race and ethnicity (Fealy, G. and Mc Namara, M. 2009). It constantly evolved through language and communication (Burman & Parker 1993; du Gay, 1996). People have, of course, objective existence but the social meaning of this existence was discursively generated rather than inherent or internal to people (Hardy & Phillips, 1999). People tend to make age specific expectations about one's behaviours and characteristics. Instead of viewing people as individuals, we tend to generalize people in line with their social group membership, age group and gender (Tajfel, 1978). It is usual for us to categorize people into gender, age groups, and identify typical attributes and generalize such attributes to entire group. It leads to create and perpetuate stereotypes through cultural symbols, language and communication.

Elder adults constitute a unique social category, which evolve over life course (Howard, 2000). Everyone invariably ages over time and contributes to the pool of old age. Age identity is therefore both ascribed and achieved thus boundaries of age group membership are permeable but defined developmentally (Gatz & Cotton, 1994). There is a ubiquitous relationship between subjective and chronological age. A good number of people feel that they are younger (subjective) than their chronological age. When people get old, their definition of 'when old age begins' becomes older and older (Logan, *et al.*, 1992). Elderly persons engage in greater amount of stereotypes than the younger age groups do.

However, age identity has received considerably less research attention from sociological and social psychological researchers with a few exceptions (Demo, 1992; Howard, 2000; Barrett, 2005). Scholars treated devalued social identity as a liability during ageing. It is associated with identity-induced stressors, from which poor health may results (Thoits, 1991; Krause & Borawski-Clark, 1994; Contrada & Ashmore, 1999). The constructs such as gender, ethnic, and racial identity are well-examined (Mumby & Clair 1997). However, such 'discourses of difference' (Wodak, 1996) has provided inadequate attention to age identity and its comprehensive measurements. Unlike

other areas of identity research, incomprehensive measurement of age identity further reduced the amount of research on age identity and related constructs, especially in India (Mariyam & Jose, 2015; Jose & Meena, 2015).

Age identity significantly shapes successful ageing in older adults (Montepare & Lacuman, 1989; Logan, *et al.*, 1992; Demo, 1992; Howard, 2000). The demographic transition lead to a rapidly ageing societies (Mandal, 2011; Jose & Meena, 2015), hence, we need advance research on age identity measurements since a comprehensive measurement of age identity as a multi-dimensional construct shall yield a cutting edge measurement and analytical alternatives for age identity shaped developmental outcomes in older adults.

Age Identity: Operationalization and Measurement

The current age-identity measurement practices in social psychological literature, including social gerontology, are widely varied. Most scholars have operationalised the construct age identity as chronological age subtracted by subjective age (i.e., person's feeling of how old is he/she most of the time?) whereas the 'age-identity' represents the difference between subjective age and chronological age (e.g. Barrett, 2005; Westerhof & Barrett, 2005; Rubin & Berntsen, 2006; Schafer & Shippee, 2010). Kleinspehn-Ammerlahn, *et al.*, (2008) operationalised subjective age (identity) in two dimensions viz., felt age (how old do you feel) and physical age (how old do you feel when you see yourself in a mirror) whereas they measured the discrepancy between subjective age and chronological age as the age-identity variable. However, others (Bellintier, *et al.*, 2015) have considered a tri-dimensional subjective age viz., felt age, ideal age and look-age.

Self-awareness of growth is a most basic subjective experience during adult life. Subjective age and age identity is frequently used to designate this self-awareness of ageing and growth. Further, studies measured subjective ageing experience in terms studying ageing stereotypes (Hummert, 2011) affecting health and functioning through internalization of stereotypes (Levy, 2009). Researchers frequently used Personal Experience of Aging Questionnaire (Steverink, *et al.*, 2001) and Image of Ageing Scale (Levy, *et al.*, 2004) to measure

age-identity related self-conceptions. Nonetheless, despite this diversity of empirical approaches to age identity measurement, evidence consistently yields associations between age structures and number of development outcomes such as physical health, cognitive functioning and psychological wellbeing. In addition, Hubley (1998) developed a Subjective Age Identity Scale that measures a person's felt age at present, physically, mentally and socially as well as age oneself looks to self and others. Other category of studies used Attitude Towards Own Ageing subscale of the Philadelphia Geriatric Morale Scale developed by Lawton (1975) to measure self-perceptions of ageing which is equated with age-identity at many instances in the article (Kwak, *et al.*, 2014; Sargent-Cox, *et al.*, 2014).

Steverink, *et al.*, (2001) argued that personal experience of ageing is multi-dimensional phenomenon and proposed a three-dimensional model. First two dimensions capture the decline and losses oriented aspects and represented individual's perception regarding physical decline and social losses. Third dimension captured the aspects of continued growth and adults' perceptions that ageing is associated with gains and further development. Manfred and Wahl (2010) argue that narrowing down the personal experiences of ageing into either uni-dimensional concept represents only a subset of ageing related phenomena while such approaches leave out many important features. As an alternative, they proposed a multi-dimensional approach named Awareness of Age Related Change (AARC), which has (a) health and physical functioning, (b) cognitive functioning, (c) interpersonal relations, (d) social cognitive and social-emotional functioning, (e) life style and engagement, which they fit into a conceptual framework of AARC. Besides, Brothers, *et al.*, (2015) used subjective age, attitude towards own ageing and awareness of age-related change to study personal ageing experiences.

Evidently, operationalization and measurement of age identity in scholarly literature vary substantially while predominant conceptualization and measurements tapped subjective experience of ageing. Key measurements of age identity are thus, subject to personal bias and inadequate interpretations. Yang (2000) argued that study of age identity has significant implications on individual's development over

life course while simultaneously representing the vision of aging from older adults. Besides, age identity representing growth and development outcomes such as functionality, health and mental health, quality of life, wellbeing and above all, successful ageing in older adults (Kwak, *et al.*, 2014; Barrett, 2005; Sargent-Cox, *et al.*, 2014). Furthermore, to the best of our knowledge, we have not come across a scale developed and validated within Indian socio-cultural structures that examine age identity. Hence, locating within the need for a relatively reliable and valid age identity measurement, which is culture sensitive in Indian older adult, we conducted a study to develop Age Identity Measurement Scale.

Theoretical Premise

Identity threat model of stigma (Major & O' Brien, 2005) postulates that possessing a consensually devalued social identity itself is a stigma that increases one's risk of exposure to potentially stressful situations. Collective representations, situational cues and personal characteristics affect people's appraisal of the significance of those events for their wellbeing. Identity threats occur when an individual appraises stigma inducing situations that are potentially harmful and as exceeding the coping ability such situation demands. It results in both voluntary (coping efforts) and involuntary (anxiety, increased vigilance and working memory loaded) responses. Such voluntary and involuntary responses lead to negative outcomes as reduced self esteem, poor health and academic under achievements (*Ibid.*).

Method

Research Design: This study had two sub-parts. The first was the scale development part and the second one was the scale validation part. Using an exploratory research design, this study designed and validated psychometrically reliable and valid measure for age identity. Face-to-face interviews were conducted by trained interviewers with older persons and these interviews were held at their respective homes and old age homes.

Participants: Participants constituted 'older adults aged 65 years and more living in selected districts in Kerala, southern India. Older

adults' mean age was 75.5 year (65–102 yrs) and ± 7.6 years. Older women were 61.2% ($n=382$) and men were 38.3% ($n=242$). Mean education was 4.2 years (0-to 18 yrs) and (± 3.2 yrs). About 43.4 per cent, 8.3 per cent men were widowers and 46.3 per cent women were widows.

Selection Procedure: We divided Kerala into three geographic divisions, viz., the north, the central and the south Kerala. All districts of Kerala (i.e., 14) were listed under three geographical divisions. We selected three districts one each from each geographic division using lottery method. The selected district from the northern division was Kannur; Ernakulam district was from the centre and Pathanamthitta district was from the south. Using the state and district level database on Panchayats from the ministry of Panchayat Raj Affairs, Government of India, we developed a sampling frame through engaging multiple levels of sample selections.

Using a multi-stage culture sampling procedure, we selected 25–30 study participants each selected at primary sampling unit (PSUs) who were contacted for interviews at their residence. This study sampled 624 older adults from three districts namely Kannur ($n=210$), Ernakulam ($n=210$) and Pathanamthitta ($n=204$). A detailed description of sampling design is discussed elsewhere (Jose & Cherayi, 2016).

Measures: The interview scheduled included items of Age Identity Measurement Scale (AIMS) alongside with Rosenberg Self-esteem Scale (1965), *perceived discrimination subscale of the Stigma and Discrimination Scale* (Genberg, *et al.*, 2008), Life overall subscale of Older Persons' Quality of Life Questionnaire (Bowling, 2009) and Social Integration subscale of the Social Relations Scale (O' Brien, *et al.*, 1993).

Age Identity Measurement Scale: In order to generate items, we have completed several systematic steps as follows. First, we conducted an extensive review of literature on identity and stigma theories to identify how age identity is conceptualized within social psychological literature (Major & O' Brien, 2005). Grounding within the theoretical premises acquired, the researchers reviewed the existing

scales on identity measurement in general. General identity measurements reviewed were Collective Self-esteem Scale (Luhtanen & Crocker, 1992), Multi-group Ethnic Identity Measure (Phinney, 1992), Berger HIV Stigma Scale (Berger, *et al.*, 2001) and AIDS Stigma and Discrimination Scale (Genberg, *et al.*, 2008). The age identity-specific measurement scale was Personal Experience of Aging Questionnaire (Steverink, *et al.*, 2001) and Image of Ageing Scale (Levy, *et al.*, 2004), Attitude Towards Own Ageing subscale of the Philadelphia Geriatric Morale Scale developed (Lawton, 1975). The authors further identified important aspects of general identity theories, which included self and social images, importance to self, continuity and sameness, position of self in relation to younger age, etc. Finally, the authors conducted ten in-depth interviews with older men and women that explored socio-culture specific age and ageing related images, experiences, stereotypes and worldviews. Thus, the authors generated 60 variables for Exploratory Factor Analysis (herein after EFA). Out of the 9-items from Berger HIV Stigma Scale and 2-items from Collective self-esteem Scale were modified and contextualized to include among 60 items generated which represent negative self-image and identity importance subscales respectively.

The authors subjected this draft interview schedule with 60-items/questions for face validation with three subject matter experts. Among them, one person was an expert on instrument development through statistical validation procedure (e.g. EFA), another person was a subject matter expert on issues of older adults and third person was an expert on clinical social work with older adults. The experts critically reviewed the schedule against the set measurement objectives. The team further reviewed reviewers' comments and suggestions and incorporated appropriate changes that resulted in a refined version of the interview schedule with 44-items. Altogether, 13-items were deleted due to lack of clarity and relevance. In three items, where interviewers failed to reach consensus, the authors either rewrote (one item) or deleted two items. This has resulted in 44-items in the final list of items to include in the Age Identity Measurement Scale.

These 44-items were organized as statements/questions in three subsections viz., social images, personal images and importance to

ageing self. For electing responses on social images of ageing, participants were asked to think how society viewed older persons. For instance, the item was worded as "People around me think that ageing is a time for familial confinement". Each item elicited response on a four-point Likert type rating scale with 'strongly disagree, disagree, agree and strongly agree' with higher value implying greater agreement with the item. The readability was assured through the involvement of three older persons who read, reviewed and gave comments on clarity, appropriateness and readability of the items included in the schedule.

Other Measures: We used other measures for validity analysis concurrently with AIMS. They were Rosenberg self-esteem scale (Rosenberg, 1965), Loneliness Scale (Hughes, *et al.*, 2004), Perceived Discrimination Subscale (Genberg *et al.*, 2008), Life Overall Subscale of Older People Quality of Life Questionnaire (Bowling, 2009), and Social Integration sub-scale of Social Relations Scale (O' Brien *et al.*, 1993).

In later part, we conducted a second level study among 100 older persons aged 65 years and above, using the newly developed Age Identity Measurement Scale (herein after AIMS) with four-week interval for examining its temporal reliability. Universe for the second part of this study formed all elderly persons in Kozhikode district in Kerala. We selected 100 samples from a selected village panchayat at Kozhikode district, by convenient sampling procedure, adhering to the same definition of older persons as well as inclusion criteria. Each participant was interviewed two times with a 4-week interval. The interviews were conducted with informed consent. The participants were contacted at their residence during day hours. The 24-item AIMS after EFA was used for interviews.

Results

Data Screening: We used prior defined strategies to minimize missing responses. Out of 650 older persons approached for interview, eight of them refused to participate and eight persons did not complete the interview. Ten older persons though completed the entire interview process, refused to answer some sections of the interview

schedule, and therefore these interviews were excluded. In order to minimize the response missing, each interview was conducted by trained interviewers, who were provided with an operational guideline for interview. Further, soon after each interview, all interviewers were asked to review the interview response, and fill up the missing responses. The missing response analysis helped to identify items with more than 5 per cent of the missing responses, which were substituted with item mean. This has resulted in a final sample size of 624 for analysis. A sample size of 300 and above is considered adequate for EFA (Comrey & Lee, 1992) while a sample size of 600 is excellent since this sample size is generally procedure stable correlations, implying stable factor structures (Field, 2005).

Construct Validity: Factor Analysis for Age Identity Measurement Scale.

The researchers examined the factorability of 44 items in the Age Identity Measurement Scale (*herein after AIMS*) considering several criteria. Initially, we conducted a preliminary analysis using R-matrix with Pearson's correlation to examine the correlation coefficients; thereby addressing issues of collinearity and singularity in scale items. The R-matrix was scanned for significance level greater than 0.05 and correlation coefficients greater than 0.09. We deleted 4-items that violate these norms; therefore resulting a 40 items for further analysis. Subsequent test improved data set since the test of Determinant = 2.124E-010, which is greater than 0.00001 (which is 0.0002124), therefore the test result suggests that multi-collinearity is not a significant issue in the data. The authors examined normality in the data set. It is critical to have normality within data (Child, 2006) while ensuring no multivariate and univariate outliers within data (Field, 2009). Invariably, ensuring these normalities enable generalizability of the scale beyond the sampled population (Ibid.).

Further, the authors used Kaiser-Meyer-Olkin (KMO) test to measure sampling adequacy in this analysis. The value of KMO varies from 0 to 1, when a value of 0 indicates the sum of partial correlation is large relative to the correlations. Therefore, it results diffusion in the pattern of correlations. This means factor analysis is inappropriate (Kaiser, 1974). In this data, we found a KMO value of 0.947, which is

near to the value of 1, which means the pattern of correlations were compact, therefore factor analysis would give distinct and reliable factors (Kaiser, 1974; Hutcheson & Sofroniou, 1999). Finally, Bartlett's measure tests the null hypothesis that the original correlation matrix is an identity matrix (Field, 2005). If the R-matrix is an identity matrix, then the correlation coefficient would be zero; hence we tested this relationship and found that Bartlett's Test of Sphericity was significant ($\chi^2(780, N=624)=13560.513$; $p<.001$). Thus, the result suggests that Exploratory Factor Analysis (*herein after EFA*) is appropriate in the given data set.

After the deletion of 4-items from AIMS, the resultant 40-items were entered into SPSS-version-21 for exploratory factor analysis. These data were collected and analysed with a prior assumption that underlying factor structure was caused by latent variables; components were calculated using all of that variance of the manifest variables, and all of that variance appear in the solution (Ford, *et al.*, 1986). Invariably, the authors approached the analysis with an apriori assumption that variables were likely to correlate (Floyd & Widaman, 1995). Hence, we preferred factor analysis to Principal Component Analysis (PCA). The maximum likelihood is a best factor extraction method, when the researchers have reasons to believe that their data are relatively normally distributed (Fabrigar, *et al.*, 1999). Because, "it allows for the computation of a wide range of indexes of the goodness of fit of the model [and] permits statistical significance testing of the factor loading and correlations among factors and computation of confidence intervals" (p.277). Hence, the authors preferred maximum likelihood method.

Factor rotation enable interpretability of factors since it maximizes loading on each variable on extracted factors whilst minimizes loading on all other factors (Field, 2005). We used Oblique rotation (i.e., direct oblimin) since this study aims at examining latent variable that cause the manifest variable to co-vary. Oblique rotation was used when factors were not rotated 90° from each other and is considered to be correlated (Costello, & Osborne, 2005). Using Oblique rotation (MLR) with Direct Oblimin allow factors to correlate (Grosuch, 1983). Invariably, this technique discriminates

between shared and unique variance, therefore when factors were uncorrelated, it takes care of inflated covariance accounted for, by components.

The researchers fixed factor loading necessary for inclusion at 0.50. It is because, a factor loading of .55 explains 30 per cent of the variance (rated as “good”), while 0.45 explain 20 per cent of the variance (rated as “fair”) (Comery, & Lees, 1992). Hair, *et al.*, (1995) categorised these loadings using another rule of thumb as ± 0.30 = minimal, ± 0.40 = important, and $\pm .50$ = practically significant. We fixed 0.50 item factor correlation explains 25 per cent of the variance as cut of out point and items with low factor loading (less than 0.50) were excluded for every factor across different factor solutions.

Eigenvalues associated with each factor indicates the variance explained by that particular linear factor (Field, 2005). Initial eigen values showed that the first factor explains 35.3 per cent of the variance, the second factor explains 7.7 per cent variance while third and fourth factors explained 4 per cent of variance with eigen values just over 1. We examined three, four, and five factor solutions using direct oblimin rotation. The four-factor solution explained 46 per cent of the variance after extraction. The first four-factors explain high amount of variance.

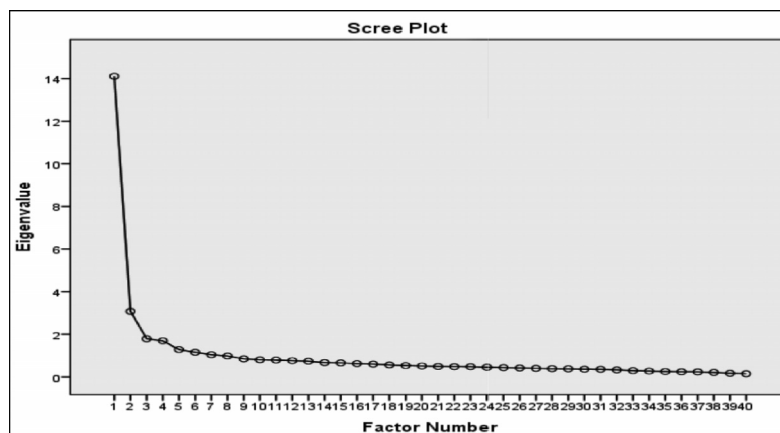
Kaiser’s criteria suggest imposing four factor solutions when there are less than 30 variables. But this was further guided by more rigorous criteria such as all variable should have communalities above 0.7 or the sample size should be more than 250 and mean communality should be greater than 0.6 (Field, 2005). In this study, we have 40 variables, which mean this criterion is not applicable. Nonetheless, there is a consensus among researchers on retaining all factors with eigen value of 1 and above, as a method is the least accurate method for selecting the number of factors to retain (Velicer & Jackson, 1990).

In this analysis, we have seven factors with eigen values just over one; in which two factors displayed two items or less in the rotated matrix. A factor should have at least three variables, although it is largely dependent on the design of the study (Tabachnick & Fidell, 2007). A rotated factor has two or less variables to be considered

reliable only if they are highly correlated ($r > .70$), but fairly uncorrelated with other variables. Having not met these criteria, we have imposed a 4-factor solution using scree plot of eigen values. The scree plot in Figure 1 suggests a simple four-factor structure while it also met the criteria for a simple factor structure (Thurstone, 1947). This decision was due to the 'levelling of eigen values' on the scree plot after fourth factor and difficulty in interpreting the fifth and subsequent factors.

Figure 1

Shows the scree plot components extracted in factor analysis



Factors were Maximum Likelihood method was used for factor extraction with direct oblimin rotation technique. Using scree plot to determine the factor-solution, we found a four-factor solution which account for 46 per cent of variance. Through these steps involved in the factor analysis, 14 items out of 40-items were eliminated since these variables could contribute significantly to the factor structure and failed to meet the minimum criteria of having a primary factor-loading of 0.50 and above while no cross-loading at all in the given four-factor solution.

Table 2
Shows factor loading, communalities and inter-item
consistency reliability coefficients

S. No.	Items/statements	1	2	3	4	Comm- unalities
Factor-1: Consensual social image ($\alpha=0.94$)						
1	I feel ageing is equal to mentally weak	.892				.763
2	I feel ageing is equal to socially withdrawn	.875				.694
3	I feel ageing is a time for familial isolation	.815				.678
4	I feel ageing is equal to physically weak	.808				.691
5	I feel ageing is a time for confinement at home	.739				.657
6	I feel ageing is a bad time in life	.673				.635
7	I feel ageing is a time for familial restrictions	.670				.654
8	I feel ageing is a time for ill health	.622				.599
9	I feel ageing is a curse	.547				.479
Factor-2: Self-image importance ($\alpha=0.72$)						
10	I like being an elderly person		.682			.453
11	Being an elder is important to me		-.639			.430
12	I am proud to be an older person		.622			.395
13	Being an elder is an important reflection of who I am.		.544			.357
Factor-3: Relative self-image ($\alpha=0.76$)						
14	I am less good than younger people because I am aged			.574		.450
15	I feel ageing is a time for ill health			.549		.528
16	My age shapes the way I feel about myself.			.532		.365
17	My age makes me feel that I am physically weak			.513		.504
Factor-4: Personalized self-image ($\alpha=0.85$)						
18	Being an older person is disgusting to me				.674	.534
19	My age makes me feel that I'm a bad person				.657	.529
20	People around me are uncomfortable as I am an older person				.569	.441
21	I feel set apart and isolated from the rest as I am getting aged				.548	.463
22	People around me ignore my good points as I am getting aged				.534	.444
23	I feel shame because I am getting aged				.518	.313
24	People's attitudes to ageing makes me feel worse about myself				.510	.343
Overall internal consistency reliability α was 0.91						

Note: Factor loading less than .50 is suppressed

Subscale 1

Consensual social image: It consists of 9-items with factor loading above 0.50, which range from 0.55 to 0.89. Five items had factor loading of 0.74 and above. Items collectively measure ageing person's personalized social image of "what typically an elderly person is". These include ageing is a bad time in life, ageing is equated to mentally weak, socially withdrawn, familial confinement, isolation, restrictions, bad time, ill-health and curse. These items are consistent with Thomson (1998) argument that older people's selfhood is shaped by the ways others view them, and act towards them. The experience of self in old age is, therefore determined largely by the ways others view the older persons. Further, we termed it as consensual self-image because when older persons consensually value the negative social prescriptions associated with ageing, such social image itself becomes stigma (Major & O' Brien, 2005). This factor had high internal consistency reliability ($\alpha = .94$).

Subscale 2

Importance of self-image: It is a 4-items subscale. All items are with a factor loading above 0.50, which range from 0.64 to 0.68. Importance of self-image is consistent with Tajfel (1981) theoretical model that define age identity as "the part of individual's self concept which derives from their knowledge of their membership in a (age) group(s), together with the value and emotional significance attached to that membership" (p.255). The 4-items measure older person's self-reflection, likeness, pride and importance they attach to self, and identify self with others in their age groups. This factor has high internal consistency reliability of .72 ($\alpha = 0.72$).

Subscale 3

Relative self-image: This subscale consists of 4-items with factor loading range from 0.51 to .57. Relative self-image refers to older persons relative distancing of 'self' from other reference (age) groups, especially young adults. Identity rests on two critical premises viz., sameness and differences. Sameness means continuity over time (i.e., irreversible ageing over time associated with increasing frailty) and difference means 'the things that differentiates oneself (as ageing persons) from others (Baumeister, 2005). In 4-items, this subscale measures older persons' relative (self-rated) quality as less-good in

comparison to adults and relative way ageing influence person's feeling about *self*. This factor yields internal consistency reliability of .76 ($\alpha = .76$).

Subscale 4

Personalized self-image: It is 7-item subscale. Items have a factor loading ranging from 0.51 and 0.67. Self-image is a person's idea and belief about himself or herself as '*what type of person he/she is*' and self-esteem is full of its evaluations. The nature of self-evaluation significantly determines the quality of self-image therefore (age) identity (Baumeister, 2005) of older persons (Jose & Meena, 2015). It tapes the influence of ageing on self-image in terms of self-reflection as bad, disgusting, concerned excessively with how others think about him or her, felt isolated, neglected and shamed, invariable with Berger HIV Stigma Scale (2001) subscale namely 'negative self-image'. The natures of these self-evaluations are negative therefore; personalized self-image in older persons is predominantly negative. This factor yields internal consistency reliability of .85 ($\alpha = .85$). Overall, AIMS yields an internal consistency of alpha was 0.91 ($\alpha = .91$)

Development of Subscales and Total Scores

For development of the scores, one needs to reverse score all positively worded items that come under the age identity importance subscale (i.e., 4–1). The composite scores were created for each of the four subscales based on the mean of the items, which had their primary factor loading on each factor. High scores imply the negative age identity in older persons.

Normality and Reliability

Table 3
Shows descriptive statistics for the four Age Identity Measurement Scale factors (N=624)

	No. of items	M (SD)	Skewness	Kurtosis	Inter-item reliability (α)
Social-image	09	25.8 (5.0)	.36	-.28	0.94
Age identity importance	04	8.9 (1.9)	.29	1.4	0.72
Relative self-image	04	12.1 (2.1)	.35	-.59	0.76
Self-image	07	17.6 (3.8)	.84	.42	0.85
AIMS	24	64.3 (9.9)	.66	.24	0.91

Normal Distribution of Subscale and Overall Measurement

We examined the normality of subscale scores as well as AIMS. In Table 3, the skewness and kurtosis were well within tolerable limits, which suggest distributions approximately appear to be normal. We used Oblimin rotation method with Kaiser Normalization. The inter-factor correlation matrix shows (not shown Table 3) that age identity importance did not correlate with social image ($r = -.050$; $p > .05$) and relative self-image ($r = -.004$; $P > .05$). While social image showed strong correlation with relative self-image ($r = .551$; $p < .01$) and with internalized self-image ($r = .508$; $p < .01$). Age identity importance strongly correlates with internalized self-image ($r = .238$; $p < .01$). Further, relative self-image strongly correlates with internalized self-image ($r = .374$; $p < .01$).

Construct validity: Relationships with Other Scales

Table 4
Shows construct validity of the Age Identity Scale and subscales with other related scales

	<i>AIMS</i>	<i>Subscale-1</i>	<i>Subscale-2</i>	<i>Subscale-3</i>	<i>Subscale-4</i>
Other measures					
Self-esteem scale	-.437**	-.428**	-.033	-.407**	-.318**
Loneliness	.603**	.490**	.198**	.415**	.572**
Social integration	-.537**	-.366**	-.285**	-.361**	-.552**
Discrimination	.690**	.566**	.213**	.492**	.646**

** Correlation is significant at the 0.01 level (1-tailed).

Age Identity Measurement Scale (AIMS)

Subscale-1: Personalized social image

Subscale-2: Age identity importance

Subscale-3: Relative self-image

Subscale-4: Personalized self-image

As Nunnally and Bernstein (1994) suggested, we analysed the construct validity of the AIMS by examining its relationship with other related constructs like self-esteem, loneliness, social integration, perceived discrimination and wellbeing. Table 4 shows the correlations between these constructs, AIMS and its subscales. AIMS and its subscale were significantly correlated with self-esteem, except between second subscale i.e., age identity importance and self-esteem ($r = -.033$; $p > .05$). All other correlations matched the prediction of inverse

relationships with AIMS and its subscales; whereas the strongest correlation of self-esteem was with global score of AIMS. Similarly, consistent with prediction, loneliness showed positive and significant correlations with AIMS and its subscales while it showed strongest correlation with global score of AIMS. Invariably, we found significant positive correlations between scores of AIMS and its subscales with social integration and perceived discrimination. Finally, we examined the relationship between AIMS and its subscale with wellbeing. The results showed that AIMS and its subscales (except personalized social image) significantly correlated while identity importance and wellbeing showed strongest inverse correlation in excepted direction.

Reliability: Temporal Stability

As showed in Table 5, subscale wise coefficient alphas were calculated to examine internal consistency reliability. Cronbach's alpha obtained range from 0.72 to .96, which implied a significant inter-item consistency upon subscales and overall measure.

Table 5
Reliability coefficients for Age Identity Measurement Scale and subscales

	<i>Coefficient Alpha</i>	<i>Test-Rest Correlations</i>
Set of items (Number of items)	(n=188)	(n=188)
Age Identity Measurement Scale (AIMS)	0.896	0.831
Personalized social image	0.889	0.851
Age identity importance	0.518	0.514
Relative self-image	0.694	0.635
Personalized self-image	0.839	0.831

We had 188 completed observations from two set of observations, therefore a final sample of 188. As showed in Table 5, the correlation coefficient ranges from 0.51 to 0.85 and coefficient alpha ranges from nearly 0.52 to 0.89. The overall measure yields a correlation coefficient of 0.831 with a coefficient alpha of 0.90, which signify the overall scale was stable over time. Nonetheless, it is evident that age identity importance subscale reported lower level of alpha coefficient (i.e., $\alpha = 0.52$) with an inert-class correlation coefficient of 0.51.

Discussion

The 24-item Age Identity Measurement Scale was found reliable and valid with a four-factor solution. The older persons aged 65 years and more, represent diverse socio-religious groups in Kerala. But, there is an over-representation of older women (61%), which is attributed to the demographic fact that women outlive men (Rajan, 2006). However, the religious composition reveals more than half of the elderly persons were Hindus, Muslims were nearly 8 per cent, which was significantly less compared to their state population proportion. The Christians were over-represented, whose state percentage was 19 per cent. The current samples were predominantly rural. Nevertheless, there was a fair representation of social groups with 51 per cent forward groups, 36 per cent other background groups, 9.3 per cent scheduled castes and 1.3 per cent of scheduled tribes, which is comparable in terms of Kerala population composition as per Census (2011).

We relied upon previous scales and social psychological theories for item generation, which was followed by modification and adaption of borrowed 9 items from negative self-image subscale of Berger HIV stigma scale (2001) and 2-items identity importance (Luhtanen, & Crocker, 1992). A group of experts confirmed that 40-items included in the list of questions/statements were relevant and clear with measurement contents. These contents confirmation was in terms of general identity theories (Tajfel, & Turner, 1986; Crocker, *et al.*, 1998; Barratt, 2005) and (age) identity measurements (Steverink, *et al.*, 2001; Levy, *et al.*, 2004).

EFA examined the underlying factor structures of the AIMS, which helped to identify a four-factor solution. The content validity of the factor-solutions was consistent with general identity theories in social psychological literature: personalized social image, relative self-image, personalized self-image and age identity importance.

Hence, we found personalized social image in the current four-factor solution was consistent with the literature, since this subscale measures 'what typically an elderly person is'. These included ageing is a bad time in life, ageing is equated being mentally weak, socially withdrawn, confinement within household, isolation, and

restrictions, bad phase of life, in ill-health and as curse. Older people's selfhood was shaped by the ways others view them, and act towards them. Thus, the experience of self in old age is, therefore determined largely by the ways others view the older persons, and more importantly, older persons' knowledge about how others view them as ageing and ailing bodies.

The relative self-image refers to 'an older person's relative distancing of self from other reference (age) groups, especially young adults. The relative self helps individuals to define themselves as a member of (age) groups, which distinguish themselves from others, gives sense of self-worth and generate awareness of self-identity as (aged) social categories (Turner & Stets, 2006). Further, identity rests on two critical premises viz., sameness and differences. Sameness means continuity over time (i.e., irreversible ageing over time is associated with increasing frailty) (see Andrew, Mitnitski, & Rockwood, 2008), while difference means 'the things that differentiate oneself as ageing persons from others (Baumeister, 2005). This subscale measures older persons' relative quality of self as less-good in comparison to young adults and in a relative way how ageing influences person's feeling about self, including health and wellbeing.

Age identity importance is consistent with Tajfel (1981) theoretical model that define age identity as "the part of individual's self concept which derives from their knowledge of their membership in a (age) group(s), together with the value and emotional significance attached to that membership" (p.255). This subscale measures older person's self-reflection, likeness, pride and importance they attach to self, and finally identify self with others in their age groups. Finally, invariable with personalized social image, the personalized self-image refers to the self-attribution of ageing due to the self-awareness of ageing, which is a most basic subjective experience in an individual during adult life (Manfred, & Wahl, 2010).

Older persons tend to internalize ageing stereotypes and images (Levy, 2009; Hummert, 2011;), which shape perceptions of negative self-image (Jose & Meena, 2015). As a result, self-image is a person's idea and belief about himself/herself as '*what type of person he/she is*',. On the other hand, self-esteem is full of evaluations of self, while the nature of self-evaluation significantly determines the quality of

self-image therefore (age) identity (Baumeister, 2005) of older persons. This subscale tapes the influence of ageing on self-image in terms of self-reflection as bad, disgusting, concerned excessively with how others think about him/her, felt isolated, neglected and shamed. Evidently, the natures of these self-evaluations are negative; therefore, the personalized self-image of older persons is predominantly negative.

Persons with devalued identity internalize socially ascribed attributes of self-identity, which in turn influences the formation of negative self-image. It is intimately associated to self-concept (Berger, *et al.*, 2001), self-esteem and identity (Bausimester, 2005). Invariably, age identity and its subscales (except age identity importance) inversely correlated with age self-esteem as theoretically expected direction, yielding evidence for construct validity. AIMS and its subscales significantly correlated with loneliness. Individuals with devalued identities experience reduced social integration (Jose & Cherayi, 2014, 2016, Jose, *et al.*, 2016). We found AIMS and its subscales inversely correlated with social integration. The stigma disposes individuals vulnerable to identity threat resulting in perceived discrimination (Crocker, *et al.*, 1998). Perceived discrimination significantly increased negative age identity (Jose & Meena, 2015). As explicated, perceived discrimination significantly correlated with AIMS and its subscales. Evidently, negative age identity significantly reduced older persons wellbeing (Jose & Meena, 2015). Invariably, age identity and its subscales inversely correlated with wellbeing (except wellbeing and personalized social image).

Nunnally and Bernstein (1994) suggest an alpha of 0.70 and above yield a reliable internal consistency of items within a factor. In line with this, we examined the subscale wise internal consistence reliability for four-subscales, which yielded alpha ranging from 0.72 to 0.92. These were higher from the suggested criterion of 0.70, thus high alpha of 0.92 of the 24-items on AIMS implies these items together measure a single construct though it is multi-dimensional one. Besides, we conducted a separate data collection, using AIMS with 24 items after EFA with 100 home dwelling older persons, over four-week interval. The test-retest reliability coefficients evidenced temporal reliability, suggesting subscales and global scale scores are stable over time.

Conclusion

Age identity measurement and its subscales were valid and reasonably stable over time when used with large and diverse religious and social groups of older persons in south India. It is associated with physical and mental health and successful ageing. Negative ageing experience significantly disposes older persons vulnerable to face social vulnerabilities. Perceiving and internalizing the social prescription of ageing self, consensus validation of ageing self as society prescribes, one's own individuation and differentiation of self-from other age categories significantly influence the way one values self. Hence, negative ageing experiences pose threat to one's own ageing self-identity as an ageing persons, resulting many forms of psychosocial and health implications to older persons' life. Nonetheless, AIMS yielded inconsistent stability of scores on at least one of its subscale (i.e., age identity importance). In addition, the construct validity checks shows self-esteem did not significantly correlate with age identity importance and internalized social-image did not significantly correlate with wellbeing.

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A Cross Sectional Study on the Nutritional Status and the Depression Level of the Elderly People of Nimta and Surrounding regions of North 24 Parganas

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ABSTRACT

The present study was conducted on 50 elderly people (Male = 29 and female = 21), age varying from 60 to 80 years, residing in the locality of Nimta, West Bengal. Screening of the subjects was performed by the Mini Nutritional Assessment (MNA), a simple, validated screening tool for nutritional risk in elderly persons. For screening of depression, Geriatric Depression Scale (GDS-30) was used. The overall prevalence of malnutrition among the subjects was found to be 56 per cent and proportions of 'At Risk' and normal subjects were 38 per cent and 6 per cent respectively. 20 per cent of the elderly people in this study were found to be suffering from chronic energy deficiency. According to the scores of the GDS system, 70 per cent of the subjects were found to be suffering from mild depression, 30 per cent were found to be suffering from severe depression while none of the subjects were found without depression. Regression analysis identified years of education, mid arm circumference (MAC), medicines taken per day and monthly income as the significant predictors for MNA score among all the factors.

Key words: Ageing, Nutritional status, MNA, GDS

Old age is viewed as unavoidable changes in different aspects like physiological, psychological, social, emotional, and financial. The physiological changes are like metabolic, hepatic, gastrointestinal, renal, skeletal, neurological, and immunological and also loss of teeth, difficulty in swallowing, loss of appetite affecting the food intake which has a drastic effect on nutrition of elderly. Financial causes like reduction of income, higher expenses for medicine, low purchasing capacity, social causes like isolation, getting less importance and attention from family members, religious causes including avoidance of foods at particular days and objection to some foods, psychological causes including depression, loneliness and insecurity, all these factors have a negative effect on dietary habits so that they are malnourished or may prone to malnutrition. Depression is one of the most common and reversible causes of malnutrition in elderly. The relationship between nutrition and depression is complex. Depression has been associated with under-nutrition, over-nutrition, and deficits in specific food components and nutrients. The term “depression” can apply to a transient mood, a sustained change in mood, a symptom, or a disorder. The term is used to refer to unipolar or major depression that is characterized by persistent low mood or sadness and accompanied by both physical and psychological symptoms of at least 2 weeks duration and with associated impact on social functioning.

Many older adults are at risk for developing malnutrition, the lack of adequate nutrition to maintain health. The main cause of malnutrition in older adults is inadequate food and nutrient intake. A poor appetite or problems with chewing and swallowing may lead to lower food intake. Older adults who care for themselves, may have problems purchasing and transporting food to their homes, and may have difficulties preparing nutritious meals. Many common medications contribute to poor food intake through side effects such as nausea, dry mouth and gastrointestinal complaints. Malnutrition can also result from diseases or health conditions that cause problems with the digestion of food and absorption of nutrients. Malnutrition in older adults may lead to a poor quality of life and contribute to higher care needs, hospitalization and increased health care costs.

The prevalence of depression and feeling of loneliness was estimated to be about 22.4 per cent among elderly population

(ZarinaNahar Kabir, *et al.*, 2006). The World Mental Health Survey Initiative carried out cross-sectional research in mental health, especially in developing countries and found that the prevalence of depression in a population based study conducted in an old age home in India was 45.9 per cent. While in rural Bangladesh, it was reported to be 29 per cent and in a *per-urban* clinic based study in Uganda, it was reported to be 6.1 per cent (Karim, H.A., 1997). In a study by the World Health Organization (WHO) conducted at 14 sites, the most common diagnosis in old age was depression. Depression is estimated to affect 340 million people and among them 160 million people are in old age, globally (Nandi D.N., *et al.*, 1976).

Many studies associated with geriatric nutrition were conducted in India and abroad. In one of them at Bangladesh it was found that 50 per cent of the population was suffering from chronic energy deficiency. MNA revealed a prevalence of 26 per cent for protein-energy malnutrition and 62 per cent for risk of malnutrition. Health problems rather than age had a negative impact on nutritional status. Level of education and food expenditure were directly associated with nutritional status (Zarina Nahar Kabir, *et al.*, 2006). Another study in Hawassa city, Southern Ethiopia concluded that the mean MNA score was 18.95 ± 3.89 and there was no significant difference across gender. 28.3 per cent of the elderly were identified as malnourished according to MNA score and 62.4 per cent were at risk of malnutrition. A significant correlation was found between total MNA score and all items of the MNA and the participants' 'self-perceived nutritional status. The area under the curve (AUC) was found to be 0.84, indicating overall accuracy of the tool. The sensitivity and specificity of the MNA tool using established cut off point were found 80.1 and 72.5 per cent respectively. However, using the Youden index the best cut-off point to detect malnourished and at risk of malnutrition was found 15 with sensitivity of 92.1 per cent & specificity of 43.5 per cent (Hailu Hailemariam, *et al.*, 2016). Studies done at the Nutrition Unit, La Paz University Hospital, Madrid, Spain, showed that according to MNA score 77 per cent of the patients were at risk of malnutrition or was frankly malnourished. Low blood levels of albumin, cholesterol and vitamins A and D showed a statistically significant association with malnutrition or risk of malnutrition.

Separate evaluation of the MNA-SF showed that it was accurate, sensitive and had predictive value for the screening process (I. Calvo, *et al.*, 2012). Another study done by Department of Community Medicine, Jawaharlal Nehru Medical College, KLE University, Belagavi, Karnataka, India, on Mini Nutritional Study shows that 44.7 per cent were having BMI less than 19, 14.7 per cent were having BMI 19 to less than 21, 5.8 per cent were having BMI 21 to less than 23, and 34.7 per cent were having BMI 23 or greater and 43.7 per cent males and 43.3 per cent females were at risk of malnutrition. 25.4 per cent males and 21 per cent females were suffering from malnutrition and only 31 per cent males and 35.3 per cent females were well nourished. However, the association of gender and nutritional status of elderly was not found to be statistically significant (Divya Kansal, *et al.*, 2016). One study (Meena Shivraj, *et al.*, 2014) done at the department of Medicine, SP Medical College at Bikaner of Rajasthan on MNA and the result revealed that 11.6 per cent elderly were malnourished where 46 per cent were at the risk of malnutrition only 42.4 per cent were well nourished. Malnutrition and risk of malnutrition was more common in rural 52.21 per cent vs. 25.41 per cent than urban 40 per cent vs. 3.49 per cent respectively. Malnutrition according to literacy status as Illiterate, literate, primary, middle, secondary, college and professional was 26.03 per cent, 8.47 per cent, 0 per cent, 6.15 per cent, 3.89 per cent, 2.06 per cent and 0 per cent respectively. Prevalence of malnutrition according to the financial status, self-dependents and dependents on others 6.85 per cent vs. 17.48 per cent respectively. Prevalence of malnutrition association with BMI <19, 19–23, >23.5Kg/m² was 47.11 per cent, 9.67 per cent, and 0 per cent respectively. Study done in Kasturba Medical College, Manipal, shows that the mean MNA scores of the subjects were higher in the subjects at own home compared to those in old age homes. The prevalence of malnutrition was 2.0 per cent in the free living elderly and 19.4 per cent in old age home residents (by MNA). There was no significant difference between at risk, mal-nourished and well-nourished groups. Total MNA scores positively correlated with mid upper arm circumference both in old age home residents and in residents at home. There was significant positive correlation between MNA scores and calf circumference in both the groups. With BMI there was significant

correlation (M. Kirtana Pai, 2011). Several studies were done in West Bengal as well on the nutritional status of elderly people by using MNA questioner method and the result of one such study shows that 15 per cent were found to be malnourished and 55 per cent were at risk of malnutrition. The association between nutritional status and older age group, female gender, dependent functional status, dependent financial status and inadequate calorie intake was found to be significant (Rashmi Agarwalla, *et al.*, 2015).

Another study in West Bengal showed 29.4 per cent elderly had malnutrition and 60.4 per cent were at risk of malnutrition. Females were significantly more malnourished than males. Older age, lower income of family, low literacy level, decreased food intake, and smaller consumption of meals were associated with lower MNA scores (Surajit Lahiri, *et al.*, 2015).

In one study on elderly peoples from different old age homes of south Kolkata showed that 57 per cent were 'at risk of malnutrition' and 22 per cent were malnourished according to MNA score (Santanu Saha, *et al.*, 2014).

Several studies are done on the MNA and GDS, all around the world. One of them (Sharvanan *et al.*, 2015) in Chittoor District, A.P., India revealed that most of the examined subjects, 75.6 per cent of them belong to the age group of 60–70 yrs. 6.21 per cent subjects were malnourished and 53.74 per cent were at risk of malnutrition. 36.06 were depressed. Among malnourished 11 were depressed and 87 were depressed among malnourished and at risk group respectively. Another study in India (Sharvanan Eshwaran Uaya *et al.*, 2016) showed that the prevalence of depression was found to be 19.8 per cent. Multiple logistic regression analysis revealed that the following were significant independent predictors of depression: nuclear family system, female sex, being single or divorced/widowed, unemployed and having a low level of education. The elderly living in a nuclear family system were 4.3 times more likely to suffer from depression than those living in a joint family system. Another study done among community dwelling elderly women in Kolkata (Bidisha Maity, *et al.*, 2015) showed mean MNA score was found to be 21.07. According to the MNA score, 28.4 per cent of the study population had normal nutritional status, 54.4 per cent were at risk of malnutrition and 17.2

per cent were malnourished. Mean GDS score was 12.1. According to GDS-30; 41.4 per cent had no depression, 37.9 per cent had mild depression and 20.7 per cent had severe depression. Depression was found to increase steadily with increase in age as evident from the increasing mean score of GDS values, which was also statistically significant. Proportion of elderly women having mild depression and severe depression was found to increase significantly in at risk of malnutrition and malnourished group of study subjects. GDS score increased significantly with decrease in nutritional status.

Study on the association of MNA and GDS is done all around the world, one of them in Iran (Sareh Keshavarzi1-Vaizi *et al.*, 2015) revealed that the mean (SD) score of MNA was 24.56. Besides 35.4 per cent were malnourished or at risk of malnutrition, while 64.6 per cent were well-nourished. As anticipated, however, the malnourished elders exhibited higher GDS scores compared to the well-nourished ones. Nonetheless, no significant difference was observed between well and malnourished elders concerning age, gender, and BMI. Another study on the Iran (Mokhber *et al.*, 2011) showed that 22.07 per cent were depressed and 11.5 per cent and 44 per cent were malnourished or at risk of malnutrition respectively. In depressed group, the prevalence of malnutrition was 14.5 per cent and the prevalence of "at risk of malnutrition" was 45.8 per cent, whereas the prevalence of malnutrition and at risk of malnutrition in non-depressed population were 10.6 per cent and 43.3 per cent respectively. There is a significant statistical difference between the prevalence of malnutrition in depressed and non-depressed individuals. With respect to the high rate of vegetative symptoms in elderly depressed individuals, malnutrition would have a higher prevalence in the depressed people. Another study (Sayed Mehdi Ahmadi, *et al.*, 2013) concluded that of all the total subjects, 43.62 per cent were depressed; and of whom, 48.01 per cent were malnourished or at risk of malnutrition. GDS had a significant negative dependence with the MNA for the entire sample. However, there was no significant correlation between age and GDS or MNA scores. Moreover, the mean GDS scores differed significantly between men and women and women were more depressed than men (27.9% vs. 15%, respectively). The elderly subjects living in urban areas were more depressed than

those living in rural areas (39.46% vs. 3.85% respectively). Study (Santanu Saha, *et al.*, 2014) done at old Age Homes of South Suburban Kolkata, West Bengal, India, found that 57 per cent were 'at risk of malnutrition' and 22 per cent were malnourished according to MNA. Psychological stress was present among 44 per cent of 'at risk of malnutrition' and 56 per cent 'malnourished' population. About 77 per cent of women having moderate depression were 'at risk of malnutrition' whereas 52 per cent of women having severe depression were 'malnourished'. High proportion of 'at risk malnutrition' and 'malnutrition' associated with presence of psychological stress and different grades of depression were the major areas of concern.

The importance of the present study is derived from the conclusion of almost all of the previous studies that majority of the elderly people in India and West Bengal are either affected with or are at risk of malnutrition, no such studies were conducted earlier in the Nimta region and by MNA method we can estimate the prevalence of malnutrition and the "at risk" of malnutrition so that we can give them appropriate dietary advice to maintain their proper nutritional status as well as their health.

Objectives

The purposes of the present study were:

1. Assessment of nutritional status of the elderly people in and around the Nimta region by means of MNA method which is an easy and non invasive questionnaire method.
2. Assessment of depression status of the subjects by Geriatric Depression Score (GDS) method.
3. Estimation of interrelationship between stages of malnutrition and depression levels, if any.
4. Measurement of anthropometric data for computation of BMI.
5. Estimation of risk factors associated with the prevalence of the malnutrition.
6. Suggestion of dietary advice for the malnourished subjects and those at risk of malnutrition.

Method

Study Subjects

The present study was conducted among the elderly people of 60–80 years of age in the locality of Nimta and surrounding regions of North 24 Pargana of West Bengal during the months of May and June 2016. Written consent from the subjects was obtained. The subjects of this study were chosen irrespective of socio economic status and disease so that reflection of this factor on nutritional status could be achieved.

They were invited to answer the questions which deal with information such as age, educational status, monthly family income, past and present record of disease, medicine taken/day, etc.

Screening was performed by the Mini Nutritional Assessment (MNA), a simple, validated screening tool for nutritional risk in elderly persons or by a history of weight loss =10% of their body weight in the 6months prior to their admission. Weight loss has been shown in several studies to be the most important predictor for nutritional deterioration (weight loss in the last 3 months is part of the nutritional evaluation of the MNA), thus it was included as an independent screening question.

Nutritional Assessment

The MNA questionnaire was used for the assessment of nutritional status. It is an instrument specifically designed for elderly people. It comprised 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.

1. *Anthropometric measurements:* Questions 1–4 include current body mass index (BMI), mid-arm circumference (MAC), calf circumference (CC), and weight loss in the last 3 months. $BMI (kg/m^2) = \text{weight (kg)} / \text{height (m}^2\text{)}$
2. *Global assessment:* Questions 5–10 include living arrangements, number of prescribed medications, and psychological stress in the last 3 months, mobility, neuropsychological problems, and pressure sores.

3. *Dietary assessment:* Questions 11–16 include number of full meals per day, protein intake, fruit and vegetables intake (over 2 bowl per day), and decrease in food intake in the last 3 months, fluid intake per day, and the ability to eat alone.
4. *Subjective assessment:* Questions 17 and 18 include subjective assessment of the participant's nutritional and health status.

Malnutrition indicator scores of <17 were considered malnourished, between 17 and 23.5 were considered at risk of malnutrition, between 24 and 30 were considered normal. Questionnaire was translated into Bengali, the vernacular, and was retranslated into English.

Depression Level

For screening of the elderly patients at risk of depression, Geriatric Depression Scale (GDS-30) was used. This tool has been validated in Iran (Malakouti *et al.*, 2006). The GDS-30 yielded a 84 per cent sensitivity rate and a 95 per cent specificity rate. Scores of 0–4 were considered normal; 5–8 indicated mild depression; 9–11 moderate depression and 12–15 severe depression.

Statistical Analysis

Statistical analysis was done using the Minitab Statistical software, version 17. Anthropometric and other parameters of the male and female subjects were expressed in terms of mean $\pm$ SD. Pie diagram, bar diagram and frequency polygon were used to express relative proportions of different categories of parameters. Pearson's correlation coefficients were computed to estimate the degree of correlation between MNA scores and other parameters. Stepwise multivariate regression analysis was used to determine the association between MNA scores and other correlated factors. Chi square test was used to assess the relationship between GDS score and various socio demographic parameters.

Results

A total of 50 elderly subjects were included in the study, of which 29 (58%) are female and 21 (42%) are male subjects. All of the subjects are within the range of 60–80 years of age and 50 per cent of the subjects belong to the age group of 60–70 yrs. and the rest (50%) belong to the group of 71–80 yrs. (Table 1).

Table 1*Table showing parentages of subjects on the basis of sex and age groups*

	Sex		Age Group (Yrs)	
	Male	Female	60-70	71-80
N (%)	21(42)	29(58)	25(50)	25(50)

The mean age height and weight of the female subjects are 68 years, 150 cm and 54.7 kg respectively and those of the male subjects are 72 years, 160 cm and 58.3 kg respectively (Table 2).

The mean BMI, Mid Arm Circumference (MAC) and Calf Circumference (CC) of the female subjects are 23.8 kg/m², 28.4cm and 31.4cm respectively and those of male subjects are 22.3 kg/m², 26.5 cm and 31.5cm respectively (Table 2). The mean years of education of the female and male subjects are 9.2 and 11.3 years respectively, whereas the mean numbers of medicines taken per day by the females and male subjects are 3.6 and 1.7 respectively.

Table 2

*Anthropometric and other parameters of the subjects
(values are given as mean $\pm$ SD)*

	Age (Yrs.)	Height (Cm)	Weight (Kg)	BMI (kg/m ²)	MAC (Cm)	CC (Cm)	Education (years)	Medicines taken (No. per day)
Female	68 $\pm$ 5.87	150 $\pm$ 0.04	54.7 $\pm$ 10.31	23.8 $\pm$ 4.29	28.4 $\pm$ 3.50	31.4 $\pm$ 3.64	9.2 $\pm$ 3.59	3.6 $\pm$ 2.52
Male	72 $\pm$ 4.04	160 $\pm$ 0.06	58.3 $\pm$ 11.17	22.3 $\pm$ 2.42	26.5 $\pm$ 3.11	31.5 $\pm$ 2.30	11.3 $\pm$ 2.10	1.7 $\pm$ 2.15

According to the WHO categorization of nutritional status based on BMI, i.e. $< 18.5 \text{ kgm}^{-2}$, 20% of the elderly people in this study was found to be suffering from chronic energy deficiency (CED) (Table 3). According to MNA score, the overall prevalence of malnutrition among the subjects was found to be 56 per cent and that of "At Risk" and normal subjects were 38 per cent and 6 per cent respectively and according to the scores of the GDS system, majority of the subjects were found to be suffering from mild depression (70%), 30 per cent were found to be suffering from severe depression while none of the subjects were found without depression (Table 3).

Table 3
Distribution of subjects according to BMI, nutritional status (according to MNA score) and depression level (according to GDS score)

	BMI			Nutritional status (according to MNA score)			Depression level (according to GDS score)		
	< 18.5	18.5–24.9	> 25	Adeq- uate	At Risk	Malno- urished	Without Depression	Mild Depre- ssion	Severe Depre- ssion
%	20	44	36	6	38	56	0	70	30

According to the MNA score, majority of the subjects were found to be suffering from Protein calorie Malnutrition (PCM) in both 60–70 yrs. (48%) and 71–80 age group subjects (64%). The subjects who were 'At Risk' of malnutrition in both the age groups, 60–70 yrs (44%) and 71–80 yrs. (32%) were also found to be higher than those with adequate nutrition in both (8% and 4%) the groups respectively (Table 4).

Table 4
Distribution of subjects in various nutritional status according to various age groups

Nutritional status		Adequate		At Risk		Malnourished	
Age groups (Years)	%	60–70	71–80	60–70	71–80	60–70	71–80
		8	4	44	32	48	64

The correlation between MNA scores and other factors of the subjects were computed using the Pearson's correlation coefficients. Pearson's correlation coefficients (Table 5) showed that among other factors only calf circumference (CC), years of education, mid arm circumference (MAC), numbers of medicines taken per day and monthly family income were found to be significantly correlated with the MNA scores of the subjects. No significant correlation was observed with BMI and number of the family members of the subjects.

Table 5
Pearson's correlation between MNA score and other factors

		CC	Yrs. of Education	MAC	Medicines per day	Monthly income
MNA SCORE	Pearson's correlation	0.421**	0.372**	0.361*	–0.295*	0.294*
	Significance level	0.002	0.008	0.010	0.037	0.038

** P < 0.01, *P < 0.05

Multivariate step wise regression analysis was used to examine the association between MNA score and other factors using MNA score as the dependent variable. Stepwise linear regression analysis (Table 6) identified years of education, mid arm circumference (MAC), medicines taken per day and monthly income as the significant predictors for MNA score (dependent variable) among all the correlated factors.

Table 6

Multiple stepwise regression for the association between the MNA score and anthropometric and other characteristics of the subjects.

Variables	Multivariate regression model	
	Unstandardized β	p-value
Medicines per day	-0.79	0.000***
Mid arm circumference (MAC)	0.48	0.000***
Yrs. of Education	0.366	0.002**
Monthly income	0.000267	0.002**

*** p < 0.001 ** p < 0.01

The relationship between GDS scores and various parameters of the subjects were computed using chi square test and the result is shown in the Table 7. No significant relationship was observed between various socio-demographic parameters of the subjects and the GDS scores.

Table 7

Relationship between depression level and various parameters of the subjects

	Depression level		χ^2	p value
	Mild (%)	Severe (%)		
BMI STATUS				
Underweight	50	50		
Normal	71.8	28.2	1.339	0.512
Overweight	75	25		
EDUCATION LEVEL				
Up to secondary level	64.5	35.5		
Higher secondary level	75	25	1.410	0.494
Higher education	85.7	14.3		
AGE GROUP (Yrs.)				

Cont'd...

Cont'd...

61-70	60	40	2.381	0.123
71-80	80	20		
MONTHLY INCOME (Rs)				
3,000-10,000	67.6	32.4	0.401	0.527
11,000-24,000	76.9	23.1		
MNA SCORE				
PCM	60.7	39.3		
At risk of malnutrition	78.9	21.1	3.160	NS
Adequate nutrition	100	00		

NS =Not significant

Discussion

The elderly form a vulnerable group as they suffer from physical, economic, social and nutritional problems (Prakash R. *et al.*, 2004). These health problems thereby contribute to disabilities (Joshi K. *et al.*, 2003). The increasing burden of health problems among the elderly will have a direct impact on the demand for health services, pension and social security payment.

Previous study conducted using the MNA questionnaire in Western Rajasthan (Meena Shivraj, *et al.*, 2014) showed a 2 per cent prevalence of malnutrition in comparison to a 36 per cent risk of malnutrition in case of the urban elderly people, whereas another study in the Bangladesh (ZarinaNahar Kabir, *et al.*, 2006) revealed a much higher 26 per cent prevalence of malnutrition and a 62 per cent of the subjects belonging to "At Risk" group. In the present study the prevalence (56%) was found to be higher than both of these studies, whereas the "at risk" group (38%) was found to be similar to the Rajasthan study (36%). In another study (Surajit Lahiri, *et al.*, 2015) in a block at north 24 Pargana, West Bengal, 29 per cent of the subjects were malnourished and 61 per cent of them were at risk for malnutrition. The prevalence of malnutrition was found to be higher in the upper age group of the subjects (71-80 yrs.) between the two groups. This is also in accordance with the North 24 Pargana study (Ibid.).

In the Bangladesh study (ZarinaNahar Kabir, *et al.*, 2006), the 50 per cent of the subjects were found with a BMI value < 18.5, indicating chronic energy deficiency (CED), in the present study this

amounts to 20 per cent, whereas in the north 24 Pargana study (Surajit Lahiri, *et al.*, 2015) only 8.9 per cent of the participants have a BMI score below 18.5.

In the present study, anthropometric factors such as the calf circumference and mid arm circumference were found to be significantly correlated with the MNA scores besides socioeconomic factors such as years of education and monthly income. In a study at Manipal (M. Kirtana Pai, 2011) MNA scores positively correlated with mid upper arm circumference and also with calf circumference. In Ethiopia (Hailu Hailemariam *et al.*, 2016) also calf circumference and mid arm circumference were found to be significantly correlated with the MNA score besides other factors. In the latter study, 'medicines taken per' day was also another significant correlated factor.

Multivariate regression analysis identified education duration, arm circumference, medicines taken per day and monthly income as associated factors with the MNA scores of the subjects. Similar result was obtained in the 24 Pargana study (Surajit Lahiri, *et al.*, 2015) where besides other factors literacy and family income were found to be associated with the MNA score. In the Bangladesh study also (5), longer education years and higher per capita daily household expenditure were significantly associated with MNA scores.

Depression is one of the most common and reversible causes of malnutrition in elderly. Elderly peoples residing at old age homes seem more vulnerable to all the threats of nutritional risk owing to their isolation from the family, meager income, psychological stressors, and limited access to health care and lack of self-care. Depression has always been a common disorder found in elderly (Katon W., and Sullivan M.D. 1990; Birrer R.B. And Vemuri, S.P. 2004; Smoliner, C. *et al.*, 2009 and Mezuk B., *et al.*, 2012). Females are more prone to depression than men (German L., *et al.*, 2008). Lack of social support, widowhood, stressful life, previous history of depression, chronic diseases are some of the causes of depression in old age (Ibid.). High magnitude of depression was observed among the elderly in this study. This reflects the need for focusing on greater awareness of depression among community members and to ensure availability and accessibility of appropriate health care services to manage it. Depression in the elderly can often lead to malnutrition or dehydration, which can

induce various kinds of physical illnesses. On the other hand, physical conditions such as malnutrition in the elderly can induce depression, because of the psychological vulnerability of the elderly. Because there is a strengthened relationship between the body and the mind in the elderly the psychiatric care seems to be necessary (Wada H (2000)

Conclusion

This study showed that more than half of the elderly between 60 to 80 yrs of age in the area under study are suffering from malnutrition, and nearly 40 per cent of the subjects were at risk for Malnutrition. Only 6 per cent of the subjects can be considered to have adequate nutrition according to the MNA score. Considering the high prevalence of malnutrition, more focus on diet and nutritional interventions are required. Low income elderly people should be provided with low cost nutritious food and free medical facility. Providing the elderly with psychiatric care, the clinician should attend to all symptoms, not minimizing the importance of biological treatment, while also trying to support the elderly patients physiologically and pay attention to their nutritional needs. The process of aging may cause the atrophic inflammation of the stomach but by itself, it could not be a reason for malabsorption or malnutrition.

Limitations-First of all, the study was conducted among 50 elderly people, a relatively small sized population at Nimta, a suburban area of Kolkata. Therefore the findings of the study may not even be generalized for inmates of old age homes located in Kolkata proper.

Secondly, qualitative research methods that might lead to more detailed assessment of the factors contributing to nutritional status of the study population were not adopted.

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Effect of Dietary Calcium and Phosphorus Intakes on Bone Health Status of Aged and Elderly Rural Women

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ABSTRACT

Bone health problems are of major concern among aged and elderly women. With the advancing age there is definite age-related reduction in bone mass which is an unavoidable biological phenomenon. However adopting healthy life factors may be helpful to minimize age-related bone loss and restore bone mass. Especially dietary calcium and phosphorus intakes play a crucial role in maintenance of bone health. Based on this background, the present study was focused on evaluating the effect of dietary calcium and phosphorus intakes on bone mineral density of rural women. 120 elderly women aged 55 yrs to 64 yrs (80 aged women age varying from 55 yrs to 64 yrs and 40 elderly women age varying from 65 yrs to 74 yrs) voluntarily participated in Bone mineral density campaigns. The findings revealed the poorer intakes of all food groups except cereal intakes. The important observation needs to be highlighted that more than half of the respondents experienced lower intakes of dietary calcium both in aged (N = 80) and elderly (N = 40) rural women. The bone health is depleting with advancing age as evidenced by the fact that none of the elderly rural women had normal bone health. In fact significantly lower intakes

of dietary calcium and phosphorus were observed with the osteopenic and osteoporotic women. The results thus well demonstrated the positive impact of essential nutrient intakes especially dietary calcium in restoring bone mass among the women.

Keywords: Aged. Rural women, Bone health, Calcium and phosphorus intake

Calcium and phosphorus are the two major minerals that play a key role in the metabolism of bone. They work in cohort with various other physiological and metabolic processes. Adequate nutrition does influence all aspects of bone health throughout human life. Phosphorus, as phosphates combine with calcium ions to form hydroxyapatite, the major inorganic molecule in teeth and bones. Individuals with low calcium to phosphorus serum (Ca: P serum ratio) would benefit from increasing their calcium intake from foods or supplements.

Adequate calcium intake, mostly in the form of calcium supplements is recognized as essential co-therapy in the treatment of postmenopausal osteoporosis. All the registration trials of currently approved bone-active agents involved calcium supplementation and the prescribing guidelines for these agents specify calcium co-therapy. However, there have been few published studies that evaluated the various calcium salts available for this purpose. Bone mineral, the mass of which increases in successful osteoporosis therapy, is a complete salt of calcium and phosphate and manifests that both ions must be available if mass is to increase (Heaney, 2004).

Sufficient calcium intake has been shown to be beneficial to bone mass at all stages of life, but most societies have calcium intakes well below the recommended amounts. Increased calcium intake maximized peak bone mass and reduces bone loss in postmenopausal women by . 0.8 per cent/year, a 40 per cent decrease, when compared with untreated women. Calcium effect is generally significantly less than those of standard antiresorptive therapy. However, additional calcium can enhance bone mass when added to standard antiresorptive therapy (Nieves, *et al.*, 2005).

In spite of clear evidence of the positive effect of both calcium and phosphorus intakes, the relevant studies on the relationship between

nutrient intakes and acquisition of bone mass were not well established in India. That too, the diets of rural women basically low in essential nutrients. The condition seemed to be still accelerated as the age progressed towards aged and elderly. Based on this back ground, the current research aimed at assessment of nutrient intakes and studying the impact on the bone health status of aged and elderly women.

Methodology

The study was conducted in rural aged (55 to 64 years) and elderly women (65 to 74 years) from nearby Tirupati town who voluntarily participated to attend the orthopedic clinic to undergo bone density testing during BMD campaigns. The sample comprised of 80 members from aged and 40 members from elderly. From the selected women, the dietary intakes were estimated through 3-day dietary recall and one day weighment method. Based on the food consumption, the intakes of two essential elements viz., calcium and phosphorus were calculated (Gopalan, *et al.*, 2011).

The selected women were made to undergo for Bone Mineral Density (BMD) testing using Ultra Sound bone densitometry measured at heel bone. The women groups were categorized into normal, osteopenia and osteoporosis based on WHO classification of osteoporosis using BMD T-scores (Hans, *et al.*, 1998)).

1. *Location:* The local orthopedic clinic which was constantly engaged in organizing BMD campaigns popularized for the treatment of bone health ailments was purposively selected. Rapport was built up with the hospital staff and information was being obtained during the research period regarding the dates of camps and accordingly received the prior consent from the medical authorities to examine bone mineral density.
2. *Sample:* The women between the ages of 55 to 74 years, who attended the orthopedic clinic to undergo bone density testing during BMD campaigns constituted the study population. To predict the age-related changes and analyze the relationship between dietary intakes and bone mineral density in rural women, the rural sample was pooled into aged (55–64 years) and

elderly (64–74 years) with a sample size of 80 and 40 in the respective age groups with a total sample size of 120 rural women subjects.

3. *Dietary intakes:* The dietary intakes were estimated through 3-day dietary recall and one day weighment method and calculated the nutrient intakes for the essential nutrients. Both calcium and phosphorus nutrients being the essential nutrients required for bone formation and maintenance of bone mineral density were interpreted in relation to bone health status in terms of osteopenic and osteoporotic conditions from the Nutritive value of Indian foods of Gopalan, 2005.
4. *Statistical analysis:* The calculated dietary calcium and phosphorus intakes by rural women were compared against BMD T-score as per WHO classification of osteoporosis and subjected to statistical analysis (SPSS 11.0 version) by the use of t-test. The results obtained were analyzed age wise for the mean differences in dietary calcium and phosphorus intakes between normal vs. osteopenia, normal vs. osteoporosis and osteopenia vs. osteoporosis women subjects by considering significant differences.

Results and Discussion

Food Intakes Diet plays a crucial role in maintenance of optimal bone health. The dietary deficiencies not only alter the general health condition of individual but also reflect the status of bone health. The food intakes are necessary to assess the actual essential nutrient intakes of the women. The dietary intakes were calculated in terms of food groups like cereals, pulses and legumes, dairy products, roots and tubers, green leafy vegetables, other vegetables, fruits, sugar and fat. The mean individual food intakes of women were compared against Recommended Dietary Intakes (RDI) of Indian Council of Medical Research and calculated the per cent differences. Thus the gaps were analyzed and the results were depicted in Table 1.

Table 1
Mean food intakes of rural women: A comparison with ICMR-RDI and calculated per cent differences (gaps)

<i>Food group</i>		<i>Aged</i>		<i>Elderly</i>	
		<i>Mean Intake</i>	<i>% Difference</i>	<i>Mean Intake</i>	<i>% Difference</i>
Cereals (g)	330	367	11	348	5
Pulses (g)	75	26	-65	25	-67
Dairy Products (g)	300	63	-79	59	-80
Roots & Tubers (g)	200	25	-88	22	-89
Green leafy vegetables (g)	100	30	-70	26	-74
Other vegetables (g)	200	79	-61	75	-63
Fruits (g)	100	25	-75	23	-77
Sugar (g)	30	10	-67	10	-67
Fat (g)	25	10	-60	10	-60

The findings from the Table 1 clearly denoted relatively lower intakes of all food groups far below the Recommended Dietary Intakes except the cereal intake both in aged and elderly women. In fact, it was noticed that there was a surplus of cereal consumption in aged (11%) and elderly (5%) women meeting the RDI. These observations were indicative of cereal based diets predominantly among rural women. However the most pathetic situation found that they were not meeting even 50 per cent of RDI with the remaining food groups. The gaps seemed to be still higher in elderly than aged women indicating poorer intakes than the actual requirements.

Adequate protein intakes are important during old age to repair the age-related tissue damage. Unfortunately the protein rich sources of pulses and dairy products were at very low amounts especially more than three fourth of the deficits were observed with dairy products. On the other hand, protective foods such as fruits and vegetables were also essential to sustain the immunity levels at old age. The data on food consumption conspicuously represented higher deficits of fruits and vegetables intakes against RDI. The results thus well demonstrated poor nutritional status of both aged and elderly rural women. The condition was much worst with the elderly women. The food consumption pattern highlighted an immediate need to carry out necessary measures and appropriate changes.

Cattle rearing found to be the most common activity in Indian rural sector and majority of the milk produced was sold in the market. Women did not usually consume milk as such, even if they were consuming, it was in the form of coffee, tea or butter milk. Unfortunately old age people were the most neglected segment in the community who were fed only to satisfy the hungry stomach. In such a situation one could not expect the adequate intakes of fruits which actually were needed to protect against diseases through providing sufficient vitamins and minerals.

Arlappa, *et al.*, (2010) studied the consumption pattern of rural population in India. It was reported that the mean intakes of pulses and vegetables were far below the RDI. The mean daily consumption of GLV and vegetables, the rich source of micronutrients was poor as compared to suggested RDI. However, the intake of GLV in West Bengal and vegetables in the states of West Bengal and Orissa were more than recommended levels. Similarly the mean household intake of pulses, the rich source of protein was below the RDI and none of the states were meeting the suggested intakes. The lower intakes were reported in the states of West Bengal and Kerala. The average intake of roots and tubers were more than the RDI. However, the consumption was below the RDI, in the states of Maharashtra, Andhra Pradesh, Tamil Nadu, Madhya Pradesh and Karnataka. The results revealed that the rural population subsists on inadequate diets, where the mean intakes of pulses and vegetables were found to be below the recommended dietary intakes (RDI). In the present study (studied in AP) also, the intakes of roots and tubers, GLV and other vegetables were found to be very much limited where the deficits were more than 60 per cent in rural aged and elderly women against RDI.

The National Nutrition Monitoring bureau (NIN: 2002) reported the average food intake of adult women per day and found the food intakes on an average of 365g of cereal, 80g of dairy products, 27g pulses, 63 g of vegetables, 18g of green leafy vegetables, 50g of others including tubers, 26g of fruit, 13g of fats and oils and 14g of sugar and jaggary. The results indicated a definite nutrient gap against recommended dietary intakes (RDI). Similar findings were noted in the results of the present study with significant deficits of all the food groups except cereals among aged and elderly rural women.

The results of the present study highlighted a wider gap in the intake of all food groups except for the cereal intakes. This deficient intake might lead to different micronutrient and macronutrient deficiencies and affect the nutritional status of women. Moreover lower levels of intakes of dairy products and protein resources like pulses, legumes and nuts lowers bone density and leads to osteopenia and osteoporosis affecting the bone health. The results strongly recommend the necessity of proper nutrition and health education programs at the community level.

Calcium and Phosphorus Intakes Vs Bone Health

Calcium and phosphorus are the two essential elements played a crucial role in building bone mass. Hence during the current research the intakes of these nutrients were calculated among the selected women from their food intakes and calculated the gaps against Recommended Dietary Allowances (RDA). The values thus obtained were presented in the Table 2.

Table 2
Mean nutrient intakes of rural women: A comparison of with ICMR-RDA and Calculated per cent differences (gaps)

Nutrient	RDA	Aged (55-64Years)		Elderly (65-74Years)	
		Mean Intake	% Difference	Mean Intake	% Difference
Calcium (mg)	600	287	-52	252	-58
Phosphorus (mg)	1,000	903	-10	743	-26

The results from the Table 2 denoted more than half of the deficits in calcium intakes both in aged and elderly with 52 and 58 per cent deficits respectively. With regard to phosphorus intakes, only 10 per cent deficit was observed among aged women and the deficit levels were around one fourth in elderly women (26%).

Generally the adequate quantities of phosphorus were met through the diet and probably showed lesser deficits of phosphorus than the dietary calcium intakes. The higher calcium gap observed to be considered particularly with the elderly which need to be focused.

The effect of the two minerals intake on bone health was evaluated by comparing against the levels of bone density among

normal, osteopenic and osteoporotic women. The differences were identified statistically through t-test viz., normal vs. osteopenia, normal vs. osteoporosis and osteopenia vs. osteoporosis. The data was interpreted and depicted in Table 3.

Table 3
Mean dietary calcium and phosphorus intakes of rural osteopenic and osteoporotic women: A comparison with RDA – calculated t-values for the differences and level of significance

Nutrient	BMD-Status	Particulars	Aged (55–64Years)	Elderly (65–74Years)
Calcium(mg)	Normal	No.	23	Nil
		Mean	412	Nil
	Osteopenia	No.	32	10
		Mean	284	278
	Osteoporosis	No.	25	30
		Mean	214	198
	Calculated t-value	Normal vs Osteopenia	4.25**	Nil
		Normal vs Osteoporosis	6.58**	Nil
		Osteopenia vs Osteoporosis	1.30 NS	2.57**
Phosphorus(mg)	Normal	No.	23	Nil
		Mean	938	Nil
	Osteopenia	No.	32	10
		Mean	884	811
	Osteoporosis	No.	25	30
		Mean	853	705
	Calculated t-value	Normal vs Osteopenia	2.20*	Nil
		Normal vs Osteoporosis	2.62**	Nil
		Osteopenia vs Osteoporosis	1.36 NS	2.49*

Note: WHO Classification of Osteoporosis by BMD T-Score

Normal: > -1.0 Osteopenia: -1.0 to -2.5 Osteoporosis: = -2.5

** = Significant at 1 per cent level; * = Significant at 5 per cent level; NS = Not Significant

The results from the Table 3 indicated that low levels of calcium and phosphorus were observed in osteopenic and osteoporotic women than women with normal bone mineral density status among aged women. The intakes found to be significant between normal and

osteopenic women and still much higher differences were noticed with the osteoporotic condition. Whereas, it was noticed that the differences in calcium and phosphorus intakes were not at significant level between osteopenic and osteoporotic aged women. The important finding to be stressed that none of the elderly women had normal bone density identified by poor bone health status. The dietary intakes were also correspondingly at significantly lower calcium intakes at one per cent level and phosphorus intakes at five per cent level in osteoporotic women than osteopenic elderly women.

A combination of nutrients, rather than the singular effect of calcium, may have affected the results of some of the studies. In Yugoslavian study, reported 5 to 6 per cent more cortical bone in persons from dairy farming villages whose mean dietary calcium intake was 950 mg/day than in persons from a grain and vegetable farming village whose mean dietary calcium intake was 450 mg/day. However, the high calcium group had higher intakes of protein and phosphorus than the low calcium group. The diets high in calcium, phosphorus and protein enhance both calcium and phosphorus balance, thus promoting bone mineralization and maintenance.

The use of calcium supplements slows bone loss in the forearm and has a beneficial effect on the axial bone density of women in late menopause whose calcium intake is less than 400 mg/day. The mean rate of loss of total-body bone mineral density was reduced by 43 per cent in the calcium group against placebo group. The rate of loss is reduced by 35 per cent in the less and loss was eliminated in the trunk and of significant benefit in the lumbar spine and loss was reduced by 67 per cent in Ward's triangle for 2 years calcium supplementation (Reid, *et al.*, 1993). The present study results indicate low calcium intakes of below 400 mg and hence as per the above study providing them with calcium supplementation may be helpful to reduce age-related bone loss in aged and elderly women.

Calcium supplementation and pharmacotherapy are recommended in the preventive management of osteoporosis. The dietary calcium levels were determined in Singapore elderly population of 60 to 98 years who admitted to have had with hip fractures. The mean daily calcium intake was found to be 650 mg. The patients with BMD in the osteoporotic and osteopenic ranges had no significant difference

in the dietary calcium intake. The elderly patients with hip fractures were at insufficient dietary calcium intake. They would benefit from dietary education and calcium supplements to prevent deterioration in bone density and subsequent fractures. The current recommended daily intake of calcium for these patients is 1,200 mg/day.

The existing literature well explains the role of both calcium and phosphorus rather than single nutrient for building bones with higher bone density, to reduce the rate of bone resorption and the coupling effect of these two essential bone minerals in protecting the optimal bone health.

The overall results implicated very low calcium intakes from the diet in women groups than recommended dietary allowances. Comparatively, better dietary phosphorus intakes were observed than calcium intakes in all the women groups. The results highlighted the situation of low calcium intake signaling the high risk levels of more incidence levels of low and poor bone mass conditions which needs to be corrected otherwise it becomes detrimental to the bone health.

Conclusion

The findings of the present study and available literature provided a positive affect of dietary calcium and of course consequently the sufficient phosphorus intake on enhancement of bone mineral density. As deficiency of dietary phosphorus is rarely noticed, efforts must be focused on improving the dietary calcium intakes, if not sufficient through diet, it is advisable to maintain calcium levels up to at least 1,000 mg/day through supplementation of calcium along with bone resorptive agents.

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Beneficial Effects of Exercise on Cognitive Decline in Old Age

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ABSTRACT

The purpose of this study was to assess the effect of exercise on the cognitive decline of older individuals. 30 older male adults, aged 60 years above and who were capable of performing trade mill exercise, were randomly selected for this study. The selected subjects were made to run on a treadmill for 15 minutes for four weeks. Subjects were asked to fill IQCODE Questionnaire pre and post exercise as a protocol. It was done to analyse the effects of exercises on the cognition of the subjects. Paired t-test was applied to find out the level of significance in the pre test and post test values for cognition. It was found that the pre and post test cognition decline values were significant ($p < 0.05$). On the basis of the findings it may be concluded that after four weeks of exercise training daily for fifteen minutes on a treadmill, the cognitive decline of the subjects were improved significantly.

Key words: Cognitive decline, Treadmill test, Self –worth

Cognition is the set of all mental abilities and processes related to knowledge: attention, memory and working memory, judgment and evaluation, reasoning and “computation”, problem solving and decision making, comprehension and production of language, etc. Exercise training increases fitness, physical function, cognitive function, and positive behaviour in people with dementia and related

cognitive impairments (Heyn P. *et al.*, 2004). Researcher has documented the beneficial influence of physical activity engendered through aerobic exercise on selective aspects of brain function. Human and nonhuman animal studies have shown that aerobic exercise can improve a number of aspects of cognition and performance. Lack of physical activity, particularly among children in the developed world, is one of the major causes of obesity. Exercise might not only help to improve their physical health, but might also improve their academic performance. Authors examined the positive effects of aerobic physical activity on cognition and brain function, at the molecular, cellular, systems and behavioural levels. A growing number of studies support the idea that physical exercise is a lifestyle factor that might lead to increased physical and mental health throughout life (Charles H. Hillman *et al.*, 2006) Exercise of the brain and spinal cord has been involved in the up-regulation of (BDNF) brain-derived neurotropic factor (Gomez-Pinilla, Fernando, 2013).

Exercise has been found to impact molecular systems important for maintaining neural function and plasticity. It was documented that exercise has an effect on the brain and spinal cord by up-regulation of brain-derived neurotropic factor (BDNF). The ability of exercise to impact brain circulation by promoting neuronal repair and enhance learning and memory by increasing neurotrophic support has been proved beyond doubt. A paragon for the role of activity-dependent neurotrophins in the central nervous system (CNS) is the capacity of BDNF to facilitate synaptic function and neuronal excitability. As the CNS displays a capacity for plasticity throughout one's lifespan, exercise may be a powerful lifestyle implementation that could be used to augment synaptic plasticity, promote behavioural rehabilitation, and counteract the deleterious effects of aging. Exercise improves learning and memory, counteracts the mental decline that comes with age, and facilitates functional recovery after brain and spinal cord injury (SCI), disease, and depression. Exercise can activate specific neural circuits to modify the way that information is transmitted across cells at the synapse, possibly by impacting the action of specialized molecules. Although other tropic factors have their roles in promoting neuronal plasticity, an increase in BDNF and associated plasticity molecules has been the thematic epithet for the effects of

exercise in the brain, especially in the hippocampus, an area vital for supporting learning and memory processes.

Exercise-induced increase of BDNF in the hippocampus may be archetypal for the benefits of physical activity on overall CNS health. In addition to the hippocampus, exercise induces the expression of BDNF mRNA and protein in the cerebral cortex, cerebellum, and the spinal cord. As neuronal plasticity serves as the foundation for learning and the basis of recovery of function, neurotropic factors such as BDNF, which are intrinsically involved in mediating synaptic plasticity and learning and memory mechanisms, may be especially requisite in the reorganization and regeneration of injured circuits. Exercise provides a natural and non invasive paradigm to activate this plastic potential of the injured CNS by employing BDNF and similar tropic support factors. Several studies reveal that physical activity is a significant moderator of age-related cognitive decline. It was demonstrated that age-related differences in cognitive performance were observed when older adults were compared to younger participants. The studies suggest that cardio respiratory fitness is associated with more efficient cognitive functions. It was well documented that depressed participants who had exercised and had healthy controls showed no increase in negative effect in response to repeated sad mood inductions. In addition, studies have found that increased levels of exercise in everyday life produce increased positive effect in healthy people. The aim of this study was to find out whether short term exercise has beneficial effects on cognitive decline of elderly individuals.

Materials and Methods

Thirty subjects were selected randomly above sixty years. Male were included in the study. BMI of the subjects was in the range of 17–25 kg/m². Demographic variables were measured. Body temperature; Blood pressure and pulse rate were recorded. Subjects suffering from hypertension, any cardiovascular and respiratory disorders were excluded.

Participants

Residents from the community were recruited to participate in a lab-based study on exercise. They were screened for eligibility using

the Physical Activity Readiness Questionnaire (PAR-Q) to assess presence of conditions that might make physical activity too risky to participate, such as heart or joint problems (Thomas, Reading, & Shephard, 1992). Only participants who answered “no” to all questions or received verbal permission from his or her doctor were included in the study.

Exercise Protocol

The selected subjects were made to sit and relax before the test for 10 minutes in the laboratory. The entire procedure of the test was explained to them. Short Form (A.F. Jorm 1999) of the Informant Questionnaire on Cognitive Decline in the Elderly (Short IQCODE) was filled by the subjects before starting and immediately after completion of exercise protocol. Subjects were allowed to walk on a brisk pace on the treadmill for 15mins every day at the speed of 3km/hour for a period of four weeks in the morning.

Perceived Exertion

Perceived physical exertion was assessed during exercise using Borg's Rating of Perceived Exertion (RPE) scale, a 15-point scale ranging from 6 to 20 (6 = no exertion at all, 20 = maximal exertion).

Questionnaire

Questionnaire on Cognitive Decline in the Elderly (IQCODE) was filled before and immediately after completion of exercise protocol.

Statistical Analysis

Paired t-test was applied to find out the significant difference in cognition function in pre and post test. The probability (p) was set at 0.05.

Results

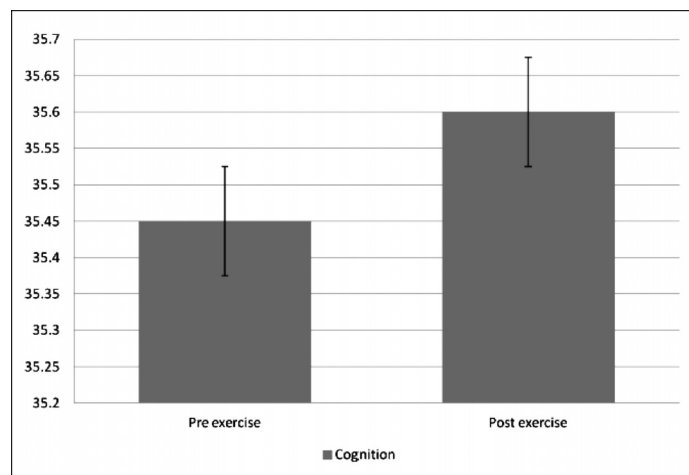
The demographic data of participants is given below. Mean BMI of the subjects were in the normal range. Mean blood pressure of the subjects was found normal. Pulse rate and body temperature were also measured.

Table 1
Demographic characteristics of participants

S. No.	Parameters	Mean $\pm$ SD
1.	Age (years)	55.8 $\pm$ 3.42
2.	Height (centimetre)	166.24 $\pm$ 6.05
3.	Weight (kilogram)	58.8 $\pm$ 4.02
4.	BMI (kg/m ²)	21.30 $\pm$ 2.65
5.	Systolic blood pressure (mm/hg)	130.50 $\pm$ 5.71
6.	Diastolic blood pressure (mm/hg)	85.75 $\pm$ 4.31
7.	Pulse rate (beats/minute)	82.31 $\pm$ 3.89
8.	Body temperature (Degree F)	97.6 $\pm$ 4.82

It was found that cognitive decline was improved in elderly old participants after completion. Cognitive decline was examined in the participants before and after completion of 4-weeks exercise of trade mill exercise protocol. The finding is depicted in Fig 1.

Figure 1
Comparison of pre exercise and post exercise for cognitive decline.



Discussion

Physical activity is associated with improved affective experience and enhanced cognitive processing. Potential age differences in the degree of benefit, however, are poorly understood because most studies examine either younger or older adults. It was found that age

differences in cognitive performance and affective experience immediately following a single bout of moderate exercise was improved.

The effects of exercise on the brain go beyond simply increasing regional blood supply, nor are they restricted to motor-sensory regions of the brain expectant to be conjoined with a motor task. It was found that there was significant improvement in the cognitive learning of the older adults who had performed the exercise on the treadmill for four weeks. Physical exercise is a subcategory of physical activity that is planned, structured, and purposive to improve specific physical skills or physical fitness. Physical activity maintained throughout life is associated with lower incidence and prevalence of chronic diseases such as cancer, diabetes and cardiovascular and coronary heart diseases. Recent studies suggest that physical exercise also protects against dementia.

Several studies support that physical activity is a significant moderator of age-related cognitive decline. Research studies suggested that age-related differences in cognitive performance were observed when older adults were compared with younger participants. Cognitive function decline in sedentary older adults was faster when compared with higher-fit individuals.

Conclusion

We conclude that after four weeks of exercise training daily for fifteen minutes on a treadmill, the cognitive decline of elderly subjects were improved significantly.

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A Systematic Review of Cognitive and Behavioural Interventions for Elderly

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ABSTRACT

The paper aims at systematically reviewing the effectiveness of cognitive and behavioral interventions proposed as well as practiced for healthy ageing. The rationale for this paper was to review the implications and efficacy of cognitive and behavioral interventions in the geriatric population. The paper will bring about the incidence rate of psychological problems, efficiency of these interventions, mental health facilities available for the elderly and utilization of these facilities in context to the geriatric population. The review will bring about a holistic view of cognitive and behavioral interventions including comparisons, advantages and limitations in regard to the elderly.

Key Words: Geriatrics, Healthy Ageing, Interventions, Cognitive, Behavioral

The field of psychology has seen a tremendous growth in terms of literature and research. Different perspectives and schools of thoughts have led to formulations of various therapy programmes and interventions in order to facilitate mental health and provide relief to people suffering from various psychological issues. The behaviorist perspective advocated by psychologists such as Pavlov, Skinner and Thorndike takes a systematic approach to the understanding of human and animal behavior. It assumes that all behavior is either a response given to the environment, which is overtly expressed and can be

modified. This perspective is based on concepts of reinforcement and punishment and was dominant for a relatively long time and had a widespread influence and is relevant to this day. However, this perspective ignored the importance of mental activities and explained psychology exclusively in terms of overt behavior. This limitation paved the way for cognitive psychology which is the study of mental processes such as attention, language use, memory, perception, problem solving, creativity and thinking (APA, 2013). This perspective gives importance to the role of mental activities that governs one's adaptability to the environment.

Cognitive Behavioral Therapy

These two perspectives gave rise to a combined form of therapy which is known as the cognitive-behavioural therapy. Cognitive-behavioral therapy (CBT) was developed around 1960s. Over the last 50 years it has become one of the most widely used forms of psychotherapy. Cognitive behavioral therapy is defined as a short term, goal-oriented psychotherapy treatment that takes a hands-on, practical approach to problem-solving.

Cognitive-behavioural therapy (CBT) is a popular and empirically supported treatment for a number of common mental health problems, including mild to moderate, major depressive disorder, generalized anxiety disorder, panic disorder, social phobia, and bulimia nervosa. CBT helps patients reduce or eliminate thinking styles and behaviour patterns that contribute to suffering. Generally, a therapist and the client work together to replace dysfunctional thought patterns with those that promote mental health and well-being. A manual is often used to help set goals and identify strategies for change (Cox & D'Oyeley, 2011).

Most psychological interventions are designed to cater to all age groups of the population. One of the most recently researched populations is the elderly. This research falls in the realm of gerontology which is the scientific study of the ageing process and the problems that elderly individuals might encounter. The period of old age comes with great amount of importance to interventions, due to various problems on account of age-related factors. These range from loneliness, death of spouse, empty nest syndrome, motor

dysfunctions, neurological disorders and other ailments. It is important to study the need of interventions currently available in India and the use of the same. This systematic review will help understand these factors and derive arguments on the way to look forward from the current scenario. Professionals in this field engage in finding ways to treat physical, mental, emotional, and social problems. *Elie Metchnikoff* is believed to have coined the term gerontology in 1903. The common psychological interventions used for elderly are psychopharmacological, psychosocial, electroconvulsive therapy, psychotherapy and most frequently cognitive behavioural therapy.

Rationale of the Paper

According to Grover & Malhotra (2015) there is lack of data on symptom profile and limited data is available on different therapeutic interventions for the management of depression in elderly from India. There is urgent need to conduct large multi-centric studies to fill this void in research. In order to fill the void and estimate the effectiveness of CBT as an intervention for the elderly a systematic review is of utmost concern. A review provides the amalgamation and analysis of researches. It is specifically valuable in bringing together a number of separately conducted studies, sometimes with conflicting finding and synthesizing the findings (Akobeng, 2005). Considering the importance of a systematic review and a need for filling the void of multi-centric studies, this paper has been formulated.

Theoretical Background

Various theorists have proposed models and propositions for explaining ageing and its therapies. These aid in building a foundation for understanding the process of ageing and related issues.

In the 1970s, Aaron Beck formulated the cognitive-behavioral model. It was an outcome of his observation that clients had streams of unreported thoughts that frequently preceded an unpleasant emotional state and if these thoughts could be brought to conscious attention it could lead to change. Basically, the model holds the assumption that an individual's behaviour and affect are determined by the way he or she perceives the world. Problems and pathologies occur when this world view or cognitions become distorted. Thus, the

realization of these distorted thought patterns are amenable to modification. CBT is a collaborative therapeutic relationship based on warmth, empathy and genuineness. It is aimed at identifying, reality testing and correcting distorted thoughts to bring about enduring changes in the individual (Beck, *et al.*, 1979). CBT has been used on a vast population which includes all age groups. It is observed that the outcome studies that Beck reviewed had a 53 year old man as the oldest participant indicating that CBT was not a very popular therapy for the elderly back then. However, research studies gradually emerged in the 1980s which explored the impact of CBT on psychopathologies such as depression, generalized anxiety disorder and other anxiety disorders (Steur, *et al.*, 1984) in the elderly.

The disengagement theory proposed by Henry and Cumming viewed ageing as a process of inevitable withdrawal practiced by the older adults which leads to reduction in social interaction. The postulates in this theory state concepts such as expectations of death and lack of interaction. On the other hand, the activity theory views successful ageing occurs when individuals have strong interactions and stay active during old age. A psychodynamic theorist Erik Erikson proposed the theory of psychosocial stages of development in which the last stage i.e., ego integrity vs despair in which he emphasized that individuals who have lived an unsatisfactory life or have developed negative thought patterns face pathologies.

These pathologies are addressed by various cognitive behavioural interventions such as brief CBT, cognitive emotional behavioural therapy, structured cognitive behavioural training, stress inoculation training, dialectical behavioural therapy, cognitive processing therapy, acceptance and commitment therapy and moral reconnection therapy (MRT). This paper aims to systematically review the overall effectiveness of CBT.

Literature Review

This paper reviewed a total of 33 research articles from various journals primarily focusing on psychology, geriatrics and cognitive-behavioural interventions, books and websites such as Psynchnet, apa, Pub Med search engine and Science Direct. The following discussion will render an overview of the evidence base for clinical

practice of CBT through evidence based reviews, meta-analyses and government statistics.

There has been an immense support for CBT interventions for the treatment of psychiatric issues in the elderly population. The meta-analyses and evidence based reviews considered in this systematic review are based on established and emerging CBT interventions for the most common disorders of late life which include depression, anxiety, insomnia, alcohol abuse, bereavement and physical ailments.

Depression

The Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (2013) describes depression as depressed mood, markedly diminished interest or pleasure in almost all activities, significant weight loss, insomnia or hypersomnia, psychomotor agitation, loss of energy, feelings of worthlessness and recurrent thoughts of death. The symptoms cause clinically significant distress or impairment in social, occupational or other important areas of functioning.

Thompson (1996), has debated that the issues that frequently bring the elderly into therapy can be distilled down into a dyad theme: Loss and transition points. The former theme includes bereavement due to loss of spouse, family members and friends, loss of social networks incorporating situations such as relocation to a new locality and lastly physical ailments can be looked upon as a loss of health. The latter theme i.e., transition points which encompasses experiences such as retirement, generation gaps, changing societies and role ambiguity. These events can lead to the triggering of depressing thoughts that makes conditions worse for these individuals. Wilkinson, (1997) suggests that cognitive distortions in older adults project a hindrance in adapting to losses. CBT interventions help the client to identify the subjective meaning of the particular loss or transition point and modify the cognitive dysfunctional thinking which is usually the basis for the subjective meaning. The eventual objective is to identify more alternative adaptive ways of perceiving the situation, which empowers to reconcile oneself to any situation.

Thompson, *et al.*, (2001), comparatively studied the efficacy of CBT and desipramine on 102 elderly participants over 16–20 therapy sessions. It was found that the CBT-Alone and Combined groups had

similar levels of improvement. In most analyses, the Combined group showed greater improvement than the Desipramine-Alone group. Thus, the study significantly approves the effectiveness of Cognitive behavioral therapy (CBT) to improve the conditions of mild depression in elderly. Also, its efficacy enhances with its use of therapeutic modalities and can turn out to be very effective for depressive elderly.

Another research by Serfaty *et al.*, (2009), determined the clinical effectiveness of CBT delivered in primary care for elderly with depression. The sample (N=204, ≥ 65) was recruited following Geriatric Mental State diagnosis of depression. The results showed that cognitive behavioral therapy is an effective treatment for elderly with depressive disorders. The result findings also concluded that CBT appeared to be significantly effective on associated specific effects of depression. A study by Steuer, *et al.*, (1984) also provides evidence regarding cognitive-behavioral and psychodynamic group psychotherapy in treatment of geriatric depression. There were no clinically significant differences, but a statistically significant difference between the types of groups was found for the Beck Depression Inventory, and this favored the cognitive-behavioral treatment.

In a meta-analysis to examine the effectiveness of Beck's cognitive therapy for depression, it was compared with other therapeutic modalities. The results indicated a greater degree of change for cognitive therapy compared with a waiting list or no-treatment control, pharmacotherapy, behavior therapy, and other psychotherapies. The degree of change associated with cognitive therapy was not significantly related to the length of therapy, it was related to the age of the clientele (Dobson, 1989). A lack of adequate representativeness of various age groups renders these results equivocal. Siegel, *et al.*, (2006) exposed 40 per cent–60 per cent of un-medicated depressed individuals to cognitive behavior therapy (CBT). A research showed that participants whose sustained reactivity to emotional stimuli was low in the sub-genual cingulate cortex (Brodmann's area 25) and high in the amygdala displayed the strongest improvement with CBT. Thus, the research indicates that the presence of emotion regulation disruptions, which are targeted in CBT, may be the key to recovery with this intervention.

Laidlaw, *et al.*, (2003) concluded that there is good evidence showing cognitive therapy to be a very effective treatment for depression in later life, even though differences are not always apparent between different psychological treatments.

Anxiety

Anxiety is an emotion characterized by feelings of tension, worried thoughts and physical changes like increased blood pressure. People with anxiety disorders usually have recurring intrusive thoughts or concerns. They may avoid certain situations out of worry. They may also have physical symptoms such as sweating, trembling, dizziness or a rapid heartbeat (American Psychological Association, 2016).

Among older adults, the anxiety arises due to concerns related to health, family, financial situations and mortality. These worries tend to aggravate due to diminishing physical and mental capacities which causes intense distress in the person's daily functioning. Statistics suggest that 5.5–10 per cent of elderly are suffering from anxiety disorders such as phobias, generalized anxiety disorder and social anxiety disorder. The prevalence rate is even higher among older people living away from their family.

Gauthier, (2005) suggests that anxiety disorders in the elderly are treatable through medication, behavioral or cognitive psychotherapy. CBT involves cognitive restructuring (replacing anxiety producing thoughts with more realistic and less catastrophic thoughts) and exposure (gradual and systematic confrontation to the anxiety provoking situations in order to desensitize the person). Another study conducted by Ost & Breiholtz (2000), investigated the efficacy of a coping-technique, applied relaxation (AR) and cognitive therapy (CT), in the treatment of generalized anxiety disorder. The results showed that both treatments yielded large improvements; there was no difference between AR and CT on any measure. Besides affecting generalized anxiety, the treatments also yielded marked and lasting changes on ratings of worry, cognitive and somatic anxiety and depression. Another study compared the efficacy of CBT and non-directive supportive psychotherapy on 48 older adults with clinically diagnosed generalized anxiety disorder (GAD). It was found that both the procedures were equally effective for the treatment of GAD

(Stanley, *et al.*, 1996). Barrowclough, *et al.*, (2001) and Wetherell, Sorrell, Thorp, & Patterson, (2005) conclude increasing evidence base for the effectiveness of CBT in old age for anxiety disorders.

Dementia and Memory

The world health organization, (2016) defines dementia as a syndrome usually of a chronic or progressive nature in which there is deterioration in cognitive function (i.e. the ability to process thought) beyond what might be expected from normal ageing. It affects memory, thinking, orientation, comprehension, calculation, learning capacity, language, and judgement. Consciousness is not affected. The impairment in cognitive function is commonly accompanied, and occasionally preceded, by deterioration in emotional control, social behaviour, or motivation.

It has been estimated that 5–8 elderly per 100 suffer from dementia. There is no treatment currently available to cure dementia or to alter its progressive course. Numerous new treatments are being investigated in various stages of clinical trials. However, there is hope through CBT in order to enhance memory to the level of functioning adequately. The past decade has seen dramatic growth in research on treatments for the psychiatric problems of older adults. The research was conducted on established and emerging interventions for the most common disorders of late life, which include depression, dementia, substance abuse, schizophrenia, and anxiety. The most extensive research support was found for the effectiveness of pharmacological and psychosocial interventions for geriatric major depression and for dementia especially CBT (Bartels, *et al.*, 2002). Kueider, *et al.*, (2014), suggested that cognitive training with older adults can improve conditions such as dementia better than drugs. However no firm results suggest that cognitive training prevents any disorder such as Alzheimer's.

Memory functioning is the core aspect that has been affected by Dementia. Tardiff and Simard, (2011) investigated the efficacy of 14 cognitive intervention programs administered to healthy elderly participants. The main techniques included face-name associations, mental imagery, paired associations, and the method of loci, improvements were observed on at least one outcome measure in each of the

techniques. This denotes the efficacy of cognitive training as a way to enhance memory in elderly.

It is also observed that developmental ageing reduces one's performance on cognitive tasks where speed is a response factor (Salthouse, 1996) and word recall tasks (Small, *et al.*, 1999; Zelinski & Burnight, 1997). CBT uses various techniques in order to improve memory, one such is homework compliance. Coon and Thompson, (2003) have shown that homework compliance significantly improves post treatment outcomes as the task of remembering to complete homework helps in strengthening memory retention.

Others

CBT has been widely used for treating such disorders successfully, many researchers have reported successful implications of CBT on schizophrenia, Obsessive-compulsive disorders, substance abuse, bipolar disorders, somatoform disorders, etc. It has been vicariously used for treating anger issues, stress related problems and insomnia. Edinger & Means (2005) studied Cognitive-behavioral therapy for primary insomnia (PI) and supported that a multi-factorial, cognitive-behavioral therapy (CBT) has significantly emerged as a treatment of choice for managing the sleep/wake complaints of PI sufferers. Gatz, *et al.*, (1998) reported that CBT is an efficacious treatment for older adults suffering from sleep disorders; additionally, CBT was found to have above average effects on ratings of subjective well-being. Another study by Anton, Moak, *et al.*, (2000), determined that motivated individuals with moderate alcohol dependence can be treated with superior effectiveness when naltrexone is used in conjunction with cognitive behavioral therapy. Naltrexone increases control over alcohol urges and improves cognitive resistance to thoughts about drinking. Thus, the therapeutic effects of cognitive behavioral therapy and naltrexone may be synergistic.

Hofmann, *et al.*, (2012), in a meta-analytic study to examine the efficacy of CBT observes that Cognitive Behavioral Therapy was examined for several problems, such as, substance use disorder, schizophrenia and other psychotic disorders, depression and dysthymia, bipolar disorder, anxiety disorders, somatoform disorders, eating disorders, insomnia, personality disorders, anger, stress, and distress due to general medical conditions, etc. The strongest support exists for

CBT of anxiety disorders, somatoform disorders, bulimia, anger control problems, and general stress.

Overall, the evidence-base of CBT is very well-built and convincing. However, additional research is needed to examine the efficacy of CBT for randomized-controlled studies.

Present Scenario of Geriatric Mental Health in India

Tiwari and Pandey (2012), reported data from a recent epidemiological study which significantly indicated the presence of an average of 20.5 per cent mental health morbidity in elderly population; nearly 17.13 million older adults suffer from diagnosable mental health problems. There is an urgent need to develop geriatric mental health care services in India. Geriatric care services are provided in all health care agencies in India, but, it isn't specialized or focused in approach to successfully counter their problems. Most hospitals don't provide appropriate facilities to geriatric population and lack of awareness in people regarding mental health is a certain cause of this present-day scenario. The research contributions of India in geriatric research are less than 1 per cent in the world scientific literature.

“The Indian government is spending less than 0.1 per cent of the GDP on geriatric health research and care, and this in itself is testimony to the fact that geriatric physical and mental health services are hardly available in the country. Elderly people are highly prone to mental morbidities due to ageing of the brain, problems associated with physical health, cerebral pathology, socio-economic factors such as breakdown of the family support systems, and decrease in economic independence. The mental disorders that are frequently encountered include dementia and mood disorders. Other disorders include neurotic and personality disorders, drug and alcohol abuse, delirium, and mental psychosis”

—Ingle & Nath, 2008

Limitations

In spite of the humongous amount of support for the use of CBT as a treatment (either unaccompanied or synergistic with other treatment modalities) for the elderly has been witnessed, it does have its limitations.

1. Pichierri, *et al.*, (2011), suggests that the current evidence on the effectiveness of cognitive or motor-cognitive interventions to improve physical functioning in older adults or people with neurological impairments is limited.
2. Elderly depressed patients with co-morbid personality disorders are generally less responsive to both pharmacological and psychotherapeutic treatment as it may influence the setting in which CBT is administered (Cox & D'Oyeley, 2011).
3. There is limited literature on the effectiveness of CBT for treatment of depression or anxiety for the elderly with comorbid dementias.
4. Certain tasks such as homework compliance or lack of motivation can retard the progress of the therapy.

Conclusion

Cognitive-Behavioural therapy has proved to be effective if used with sound clinical judgement considering the severity and complexity of the problem faced by the geriatric population. Taking into consideration the studies discussed above, the paper concludes that CBT is effective in treating as well as maintaining mental well-being in various disorders such as depression, anxiety, dementia, and substance abuse and so on. However, it cannot be claimed as the paramount therapy due to its limitations such as co morbidity and lack of motivation in the elderly. Also, the present scenario of mental health services has been stated and the need to improve the condition has been emphasized. Further implications and recommendations suggest that various techniques should be devised in the realm of CBT so as to reach out even to the underprivileged segment of the population.

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Effectiveness of Foot Massage on Improving the Balance among Elderly in a Selected Destitute Home, Mangalore

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ABSTRACT

A quasi-experimental study was conducted to assess the effectiveness of foot massage on improving the balance among elderly in a selected destitute home, Mangalore. Convenience sampling technique was used to select 60 normal elderly adults living in the selected destitute home who were divided into two groups – experimental group and control group. The data was collected using a demographic proforma and Berg Balance Scale. The collected data was analyzed using descriptive and inferential statistics. Pretest was conducted prior to the foot massage and data showing the risk of fall was collected. After the foot massage, post test was done each day for five consecutive days. Post intervention the results showed that the mean and standard deviation of the experimental group was significantly higher 38.97 ± 9 , on the 5th post test day when compared to the pretest mean and standard deviation of 31.23 ± 9.7 . There was less change in the mean and standard deviation of the control group on the 5th post test day of 32.67 ± 9.69 when compared to the pretest mean and standard deviation of 31.67 ± 9.85 . The study findings concluded that foot massage was effective in improving the balance of the elderly since the computed 't' values of change in the balance score from the pretest day to each day of intervention for independent 't' test was greater than the

table value ($t_{58} = 2.392$; $p < 0.01$.) The study findings also concluded that the computed F value for ANOVA was greater than the table value ($f_{5, 145} = 3.02$, $p < 0.01$.) Thus the study concluded that foot massage is effective in improving the balance among elderly.

Key words: Elderly; Level of balance of elderly; Berg Balance Scale; Effectiveness; Foot massage.

Ageing is not a disease, but the final stage of normal life. Ageing, the normal process of a time related change begins from birth and continues throughout life and people should be prepared for this. Old age is a crucial period when people can be more vulnerable to developing physical and psychological trauma (Sukkran 2009). Balance is required for maintaining a position, remaining stable while moving from one position to another, performing acts of daily living, and moving freely in the community. Normal elderly adults are said to be less stable in their stance than young adults. This would lead to both a higher risk of falling while standing and a delay, or an error, in the execution of voluntary movements, which could be traced in turn to inappropriate preparatory postural adjustment (Sarti, *et al.*, 2002). Many people experience increasing difficulty with balance and safe mobility as they age, which leads to the common and serious problem of falls. The loss of balance and fear of falls are associated with loss of confidence among elderly and decreasing the ability to function independently. Balance is required for maintaining a position, remaining stable while moving from one position to another, performing acts of daily living, and moving freely in the community (Laurence, *et al.*, 1988).

Several studies have investigated whether massage therapy can relieve some of the symptoms of two common conditions associated with ageing: osteoarthritis and Alzheimer's disease. Massage has a great deal to offer in ameliorating the aches and pains associated with ageing. Along with exercise and Nonsteroidal antiinflammatory drugs (NSAIDs), massage can reduce symptoms of common osteoarthritis (OA). A more recent randomized controlled trial conducted by Perlman, *et al.*, (2006) compared eight weeks of massage therapy to a wait-list control for 68 adults between the ages of 55 and 75 with radiographically confirmed OA of the knee. Participants received an hour-long massage twice a week for the first four weeks of the study

intervention, then once a week for the remaining four weeks. Therapists used a standard protocol incorporating effleurage, petrissage and tapotement, although the sequence of strokes was left to the judgment of the therapists.

For people living with Alzheimer's disease, massage is a low-risk and relatively low-cost intervention that can be easily taught to caregivers. Particularly with the concern over the long-term side effects associated with many of the medications used to manage behavior in patients with Alzheimer's disease, massage is a promising intervention that may reduce caregiver stress as well. In a systematic review of nursing literature on massage for relaxation in older adults, Harris and Richards (2010) describe the cumulative results of six experimental studies and one qualitative study that investigated the effects of hand massage on relaxation among older people with dementia. The studies measured dependent variables for verbal agitation, non-aggressive agitated behaviors, comfort and anxious behaviors.

All experimental studies of hand massage lasting from three to 10 minutes showed statistically significant improvements on dependent variables. The single qualitative study by Kilstoff and Chenoweth (1998) concluded that hand massage was a beneficial intervention for dementia. Overall, the studies on hand massage reported a consistent reduction in verbal aggression and nonaggressive behaviors in persons with dementia.

Massage is one of the relaxation techniques used commonly. Massage therapy is the third most prevalent form of alternative therapy (Benjamin, P.J, and Tappen, F.M., 2005), A simple intervention like foot massage can bring about a great deal of change in the life of the elderly by enhancing their balance and thereby improving their sense of independence and quality of life. Hence the researcher felt the need to assess the balance of the elderly and evaluate the effectiveness of foot massage on the balance of the elderly.

Statement of the Problem

Effectiveness of foot massage on improving the balance among elderly in a selected destitute home, Mangalore.

Objectives

The objectives of the study were:

1. to assess the level of balance among elderly adults.
2. to evaluate the effectiveness of foot massage on improving the level of balance among elderly adults.
3. to find the association between the pre-interventional level of balance and selected demographic and clinical variables in elderly adults.

Conceptual Framework

The conceptual framework used in the present study was adapted from the General Systems Theory introduced by Ludwig Von Bertalanffy (1968).

Material and Methods

Research Methodology

A quasi-experimental, time series with multiple institution of treatment, which includes manipulation and control was adopted for this study.

Research Setting

This study was conducted in the selected destitute home, St. Joseph's Prasanth Nivas, Jeppu, Mangalore.

Sampling Technique

In this study, convenience sampling technique was used to select 30 elderly persons (age group of 60–80 years) into the experimental as well as control group.

Sampling Criteria

- *Inclusion Criteria*

Elderly who were:

- able to speak and understand Kannada or English
- willing to participate in the study.

- *Exclusion Criteria*

- Elderly who have any sort of psychological disorders affecting the balance.
- Elderly suffering from any physical disorders such as neurological disorder, orthopaedic problems of lower extremity resulting in balance deficit or any other medical conditions that result in balance deficit like sensorineural disorders and muscle atrophy.
- Elderly who have been sensitized to any research studies on foot massage or level of balance within the past three months.

Tools for Data Collection

The data collection instruments used in this study was as follows:

- Part I : Demographic proforma
- Part II : Berg balance scale (BBS).

Method of Data Collection

The elderly between the age group of 60–80 years who fulfilled the inclusion criteria were identified and conveniently assigned to the experimental group and control group. Ten samples (five in the experimental group and five in the control group) were selected for the first five days and the data was collected from them. This was continued till data was obtained from a total of 60 samples (30 in the experimental group and 30 in the control group). The demographic and clinical data were collected using the demographic proforma and the pre-interventional level of balance was assessed using the BBS for both the experimental group and control group. Foot massage was provided from the same day onwards for five consecutive days for the samples in the experimental group while the control group samples underwent the normal interventions of the institute. The post-interventional level of balance was assessed using the BBS for the five consecutive days in the experimental group as well as the control group.

Data Analysis and Interpretation

Data was processed and analyzed on the basis of the objectives and hypotheses formulated for the purpose of the study and were tabulated and interpreted using descriptive and inferential statistics.

Section I: Description of Demographic Data

This section deals with the characteristics of the 60 elderly adults residing in destitute home in terms of frequency and percentage. The characteristics are depicted in Table 1

Table 1
Analysis of demographic characteristics of the samples in both the groups.

N = 30 + 30 = 60					
S. No	Variable	Experimental Group		Control Group	
		Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
1	Age in years				
	a. 60–65	7	23.3	5	16.7
	b. 66–70	7	23.3	7	23.3
	c. 71–75	10	33.3	11	36.7
	d. 76–80	6	20	7	23.3
2	Gender				
	a. Male	13	43.3	12	40
	b. Female	17	56.7	18	60
3	Educational status				
	a. No formal education.	0	0	4	13.3
	b. Primary education.	7	23.3	11	36.7
	c. Secondary education.	6	20	2	6.7
	d. High school.	7	23.3	6	20
	e. PUC/Higher secondary.	7	23.3	3	10
	f. Diploma/Graduation and above.	3	10	4	13.3
4	Occupation (previous.)				
	a. Unemployed.	13	43.3	15	50
	b. Government employment.	11	36.7	11	36.7
	c. Private employment.	6	20	4	13.3
	d. Self employment.	0	0	0	0
	e. Coolie.	0	0	0	0
5	The type of work done before.				
	a. Heavy work.	14	46.7	15	50
	b. Moderate work.	4	13.3	8	26.7
	c. Light work.	12	40	7	23.3
6	Duration of stay in old age home.				
	a. Less than 2 years.	2	6.7	6	20.2
	b. 2–4 years.	6	20	7	23.3
	c. 4–6 years.	9	30.3	6	20
	d. More than 6 years.	13	43.3	11	36.7

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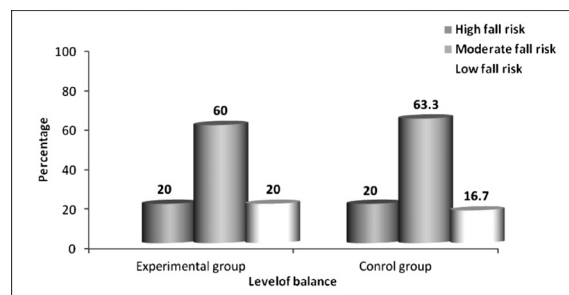
Clinical Variables					
7	Do you exercise daily.				
	a. Yes.	30	100	30	100
	b. No.	0	0	0	0
8	Type of exercise.				
	a. Physical exercise.	30	100	30	100
	b. Mind exercise.	0	0	0	0
	c. Both the above.	0	0	0	0
9	Duration of performing exercise.				
	a. Less than 15 minutes.	0	0	0	0
	b. 15–30 minutes.	30	100	30	100
	c. 30–45 minutes.	0	0	0	0
	d. More than 45 minutes.	0	0	0	0
10	Body Mass Index				
	a. Underweight.	5	16.7	5	16.7
	b. Normal weight.	20	66.6	20	66.6
	c. Overweight.	5	16.7	5	16.7
	d. Obesity.	0	0	0	0

Section II : Distribution of the Level of Balance in Both Experimental Group and Control Group

Figure 1 depicts that in the experimental group, most of the samples, 18 (60%) had moderate fall risk and there was equal distribution of samples, 6 (20%) having high fall risk and low fall risk. While in the control group, a large portion of the samples 19 (63.3%) had moderate fall risk, which was followed by 6 (20%) of the samples having high fall risk, and 5 (16.7%) having low fall risk.

Figure 1

Clustered cylindrical diagram showing the percentage distribution according to the level of balance in both the groups.



Section III: Effectiveness of Foot Massage on the Level of Balance among Elderly

Data presented in Table 2 shows that the calculated 't' value for all the days are greater than the table value of 2.392 ($t_{58} = 2.392$; $p < 0.01$). Hence, the research hypothesis (H_1) was accepted, so there is a significant difference between the level of balance between the experimental group and control group. This indicates that foot massage was effective.

Table 2
Mean, SD, and Independent 't' test of the pre and post-interventional level of balance in both the groups.

N = 30 + 30 = 60

S. No	Period of observation	Group	Mean	Standard deviation	Mean difference	t value
1.	Pretest to post test 1	Experimental group	0.767	0.568	0.733	6.729**
		Control group	0.033	0.183		
2.	Pretest to post test 2	Experimental group	2.133	1.042	1.9	8.993**
		Control group	0.233	0.504		
3.	Pretest to post test 3	Experimental group	3.867	1.008	3.367	14.49**
		Control group	0.5	0.777		
4.	Pretest to post test 4	Experimental group	6.4	1.499	5.5	16.396*
		Control group	0.9	1.062		
5.	Pretest to post test 5	Experimental group	7.733	1.363	6.733	20.721*
		Control group	1	1.145		

* – significant at 95%, $p < 0.05$ ** – significant at 99.99%, $p < 0.01$

Table 3
Mean, SD, and ANOVA of the pre and post-interventional level of balance among the experimental group.

N = 30

S. No	Period of observation	Mean	Standard deviation	ANOVA F value
1.	Pretest	31.23	9.7	440.45**
2.	Post test 1	32	9.6	
3.	Post test 2	33.37	9.4	
4.	Post test 3	35.1	9.5	
5.	Post test 4	37.63	9.1	
6.	Post test 5	38.97	9	

* – significant at 95%, $p < 0.05$ ** – significant at 99.99%, $p < 0.01$

From the above table it can be seen that the computed 'f' value (440.45) is greater than the table value (3.02) indicating that H_{01} was rejected and the research hypothesis H_1 was accepted. This indicates that the foot massage was effective in improving the level of balance among elderly.

Section V: Association between the Pre-interventional Level of Balance and Selected Demographic and Clinical Variables

The data represented in Table 4 reveals that there is a significant association between age of the elderly ($\chi^2 = 8.75$, $P < 0.01$) and the pre-interventional level of balance. Hence, null hypothesis (H_{02}) was rejected and research hypothesis was accepted meaning, there is a significant association between pre-interventional level of balance and demographic variable of age.

Table 4
Association between pre-interventional level of balance and selected demographic and clinical variables.

N = 30						
S. No.	Demographic variables	Total score < M (32) = M (32)		p value	χ^2	Level of significance
1	Age in years					
	60-70	2	12			
	71-80	12	4	0.003	8.75	Significant **
2	Gender					
	Male	6	7			
	Female	8	9	0.961	0.002	NS
3	Educational status					
	Up to secondary education	6	7			
	High school till graduation and above.	8	9	0.961	0.002	NS
4	Occupation					
	Unemployed.	7	6			
	Government and private employed.	7	10	0.491	0.475	NS
5	Type of work					
	Heavy work	9	5			
	Moderate and light work	5	11	0.07	3.274	NS
6	Duration of stay					

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	0-4 years.	3	5			
	4-more than 6 years.	11	11	0.847	0.037	NS
Clinical variables						
7	Daily exercise			Only one category so there is no association.		
	Yes	14	16			
8	Type of exercise			Only one category so there is no association.		
	Physical	14	16			
9	Duration of exercise			Only one category so there is no association.		
	15-30 minutes	14	16			
10	BMI					
	Underweight and overweight	3	7			
	Normal weight.	11	9	0.365	0.82	NS

NS- Not Significant* - 95% significant, $p < 0.05^{**}$ - 99.99% significant, $p < .01$

Recommendations

Based upon the study findings, the following recommendations were made for the future study.

1. A similar study can be extended to a larger sample.
2. A similar study can be conducted for a longer duration.
3. A similar study can be done for hospitalized elderly patients.
4. A similar study can be conducted to find out the effectiveness of foot massage on improving the level of balance among the general population with balance disorders.
5. A comparative study can be done to assess the effectiveness of foot massage on improving the level of balance of elderly people living in institutionalised and non-institutionalised homes.
6. An evaluative study can be done to assess the effect of foot massage on selected physiological parameters like pulse, blood pressure, and pain.
7. A correlational study can be performed on various variables on the level of balance of the elderly.

Suggestions

1. Nurses should be made aware of complementary therapies and of the autonomous role of the nurses in providing complementary therapies to the patients through demonstration classes as a part of in-service education and to enhance the nurse's knowledge and skill.
2. Community nurses and family members should be trained in the implementation of various complementary therapies through various training programmes.
3. Foot massage can be used in reducing symptoms like pain, increased blood pressure, and stress, as well as, to treat patients with various disorders like hypertension and diabetes mellitus.

Conclusion

Ageing involves two changes, evolution and involution. The number of elderly people is increasing in almost every country. In last three decades, the elderly has grown twice as fast as the rest of the population. India is no exception from the rest of the world. The problems of old are worsened by a large number of people migrating from villages to larger towns and cities. It is usually the younger people who move away from their native villages in search of jobs and the elderly are left behind to cope as best as they can with poverty and failing health, with nobody to care for them. The main aim of the study was to evaluate the effectiveness of foot massage on improving the balance among elderly in selected destitute home, Mangalore. The study concluded that a simple intervention like foot massage can bring about a great deal of change in the life of the elderly by enhancing their balance and thereby improving their sense of independence and quality of life.

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Morbidity Prevalence and Functional Health Limitations among Elderly in Kerala

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ABSTRACT

The main objectives of the present study were to understand the background characteristics of the elderly and to study the prevalence of morbidity, disabilities and the functional health limitations among elderly in Kerala. Data used for the study pertain to the survey Building Knowledge base on Population Ageing in India (BKPAI) 2011. A total of 1357 elderly were included, out of which 565 were males and 792 were females. Three fifths of the total elderly persons were in the age group 60–69 years, 27.7 per cent were in the age group 70–79 and the remaining were aged 80 plus. Nearly one fifth of the elderly respondents were illiterate, only 15 per cent were working, about 3.2 per cent were living alone and nearly 12 per cent were living with their spouse only. About 14 per cent of the elderly were financially independent but more than half (57%) of the aged were financially dependent of others. Mobility pattern shows that about 15 per cent of the elderly have at least one acute ailment. The prevalence of chronic morbidity among elderly shows hypertension to be the most widely prevalent illness followed by diabetes, cataract, heart disease and arthritis. About four fifth of the elderly have at least one disability problem. In Kerala, about 10 per cent of the elderly reported that they cannot perform any of the six ADL activities such as bathing, dressing, going toilet, mobility, continence and feeding. Old-old

elderly and female elderly are more vulnerable in case of functional limitations. One out of every ten elderly in the State requires some assistance to perform their daily activities such as feeding, bathing, dressing toilet use, etc. The morbidity load of lifestyle diseases and other non communicable diseases are higher in Kerala than other States in India.

Key words: Morbidity, Functional health, ADL activities, Life style diseases, Elderly of Kerala.

Population ageing is a worldwide phenomenon and persons aged sixty and above are increasing gradually in the developing and developed countries all over the world. In the turn of 21st century, population aged 60 and above is increasing at an accelerated rate and most of the rapid growth is projected in developing countries including India (Gulati & Rajan 1999; WHO, 2007). Projections indicate that the proportion of aged 60 years or over globally will increase more than 4 percentage points over the next 15 years, from 12.3 per cent in 2015 to 16.5 per cent in 2030, compared to the 2.3 percentage point increase in the share of older persons that occurred between 2000 and 2015 (UN, 2015).

Asia holds the first position (508 million) in bearing the aged followed by Europe (177 million). Among the Asian countries, China has the highest proportion of aged persons followed by India. The proportion of aged persons in India's population rose from 5.6 per cent in 1961 to 6.6 per cent in 1991 and 7.5 per cent in 2001 to 8.6 per cent in 2011 (Registrar General, 2011). The elderly population aged 70 and above which was only 8 million in 1961 rose to 21 million in 1991 and 29 million in 2001 to 39 million in 2011. In 2011, the share of older persons aged 60 years and above was 8.6 per cent which placed India in 'aged' category as per United Nations classification (Karkal, 1999; Registrar General of India, 2011). The number of persons aged 60+ rose from 19.6 million (5% of the total population) in 1951 to 98 million (9% of total population) in 2011 (Registrar General, 2011).

Among Indian states, Kerala stands in the first position of holding an account of aged 12.6 per cent of its total population as against 8.6 per cent in the country in 2011 (Registrar General, 2011). The projected figures indicate that the aged population of the state would become 18

per cent in 2021 and about 35 per cent in 2051 (Rajan, and Aiyar, 1994).

Old age in general is associated with multi-dimensional problems. Health status is an important factor in deciding the quality of life of the elderly. The 52nd (1995–1996) and 60th rounds (2004) of the National Sample Survey (NSS) data comparison showed a general increase in the reports of ailments and utilization of healthcare services among the elderly (Alam and Karan, 2010; Rao, 2006). The elderly repeatedly suffer from cardiovascular illness, circulatory diseases, and cancers, while the non-elderly face a higher risk of mortality from infectious and parasitic diseases (Alam 2000; Kosuke and Samir 2004; Shrestha 2000). According to Gruenberg (1977), there have been emerging epidemics of chronic non-communicable diseases (NCDs) in developed countries, most of which are lifestyle-based diseases and disabilities due to the advancement of demographic transition. Agarwal and Arokiaswami (2010) reported that the Indian elderly are more likely to suffer from chronic than acute illness. Ingle and Nath (2008) opine that there is a rise in NCDs, particularly cardiovascular, metabolic, and degenerative disorders, as well as communicable diseases. While cardiovascular disease is the leading cause of death among the elderly (Jha, *et al.*, 2006), multiple chronic diseases like chronic bronchitis, anemia, high blood pressure, chest pain, kidney problems, digestive disorders, vision problems, diabetes, rheumatism, and depression also afflict them (Kumari 2001; Raju 2000, Roy 1994; Shah and Prabhakar 1997). Some studies show that the prevalence of morbidity among the elderly due to re-emerging infectious diseases is quite high, with considerable variations across genders, areas of residence, and socioeconomic status (Goldman, *et al.*, 1995; Gupta and Sankar 2002; Kumar 2003; Mini 2008; Sudha, *et al.*, 2006). Kowal, *et al.*, (2010) projected that disability related to non communicable diseases will increase and contribute to a higher proportion of overall national disability, in step with the ageing processes. Although elderly persons may have chronic diseases that may not be amenable to cure, their functional disabilities, if recognized at an early stage, can often be improved greatly. Planning and delivery of health care services in this area would require information on the magnitude of the problem in the community. Physical disability and functional limitation are

common among older people (Collin, *et al.*, 1988), leading to adverse consequences such as dependency and institutionalisation. Older people's ability to function independently is important, as physical disability and functional limitation have profound public health implications with increased utilization of health care and a need for supportive services and long term care (Mahoney & Barthel, 1965).

Why the Study in Kerala?

Scenario of higher life expectancy (74.2 years) with very low fertility rates (TFR of 1.7) resulted in rapid ageing in Kerala. About 12.6 per cent of the total population is aged (60+ years) in Kerala and the growth rate of elderly is double that of the overall growth rate of population. This is one of the demographic patterns the State exhibits comparable to the developed countries. A substantial share of the 4.2 million elderly population in Kerala are found to be facing problems specific to old age, living arrangements and social security problems, health problems of chronic and acute diseases, functional limitations and disabilities, etc. This highlights the need to study the prevalence of physical disability and functional limitation, and the prevalence of morbidity among the elderly population in Kerala.

Objectives

The main Objectives of the study are

- To understand the background characteristics of the elderly
- To study the prevalence of morbidity level and the functional health limitations among elderly in Kerala

Method

Secondary data used for the study were taken from survey on Building Knowledge base on Population Ageing in India (BKPAI-2011) conducted by United Nations Population Fund and its collaborating institutions – Institute for Social and Economic Change (Bangalore), Institute of Economic Growth (Delhi) and Tata Institute of Social Sciences (Mumbai). The analysis was carried out using Statistical Package for Social Sciences (SPSS). Univariate, Bi variate analysis were performed in the study. Acute and Chronic morbidly, the two indices of functional ability of the aged as Instrumental Activity of

Daily Living Index (IADL index) and Activities of Daily Living Index (ADL index) are taken as the dependent variable and the independent variables considered are age, sex, marital status, number children, residential status, religion, caste, education, current occupational status, monthly income, living arrangement, perceived health of the elderly respondent.

Findings and Discussions

The Socio-economic, demographic and health profile and the living arrangement of the elderly respondents aged 60 and above in Kerala are given in Table 1. A total of 1357 elderly were taken for the analysis, out of which 565 males and 792 females. Age distribution of elderly shows that 59.8 per cent of the total elderly persons are in the age group 60–69 years, 27.7 per cent are in the age group 70–79 and the remaining are aged 80 plus. About 56 per cent of the elderly are currently married, 1.3 per cent are unmarried and about two thirds are divorced/widower/widowed/separated or deserted. Residential status of the respondents shows that half of them are from urban area and the remaining half are from rural area. Religious classification shows sample respondents are predominantly Hindus (58.4%). About two thirds of the elderly respondents are Muslims and the rest of them are Christians and other religious groups (18.9%). At the same time, around 8 per cent of elderly respondents are identified as scheduled caste/scheduled tribes followed by 56 per cent of OBC and around 36 per cent 'others' including forward caste.

Educational qualification of the sample population shows that nearly one fifth of the elderly respondents are illiterate, one fourth of the respondents have lower primary education and one fifth of the elderly have upper primary education. Those who have attended school till 8–10 classes stands at 24 per cent. Taking the level to more than 10 years of schooling, the percentage drops to 12 per cent.

The current occupational status among the elderly is worth mentioning as only 15 per cent of them are still working. The lion share (about 85%) is not working. About one third of the elderly have never done any paid work and two thirds of the elderly have ever done some kind of paid work. About one fifth (19.2%) of elderly have received some kind of retirement benefits from their employer and 8.6

per cent of the elderly have received some health benefits from their employer. Personal income in general is an indicator of financial well being, as those who have more income are expected to be better off than those with less or no income. About 9 per cent of the elderly reported that their source of income is salary or wages, one third of the aged persons said that their source of income is their employer pension, another one third reported as their social pension, one per cent received rental income, nearly three per cent received income from their business, eight per cent got income from agriculture or farm, about 6 per cent of elderly persons got income as remittance and 3.2 per cent received income as interest on savings and fixed deposits.

Living arrangement is very important in terms of providing support for the elderly and can, in general, guarantee their well-being. While analyzing the living arrangements of the elderly, the study shows that about 3.2 per cent of the elderly were living alone; about 12 per cent of the respondents were living with their spouse only and 84 per cent of the respondents reported that they were living with their spouse, children and grandchildren. The proportion of annual income of the aged persons shows that about 39 per cent of them were not receiving any income.

Table 1
Profile of the selected elderly persons

<i>Characteristics</i>	<i>% (N)</i>	<i>Characteristics</i>	<i>% (N)</i>
Age		Living Arrangements	
60–69	59.8(812)	Living alone/with servant	3.4(52)
70–79	27.7(376)	With spouse only	12.1(164)
80+	12.5(169)	With spouse, children and Grand children and others	84.1(1141)
Sex		Annual Income of the elderly	
Male	41.6(562)	No Income	39.1(531)
Female	58.4(792)	= 1,2000	29.8(404)
Residence		12,001–24,000	4.1(56)
Rural	50.6(687)	25,000–50,000	7.1(100)
Urban	49.4(670)	= 50,001	17.8(241)
Religion		Don't know	1.8(25)
Hindu	58.4(793)	Financially Independent	
Muslims	22.6(307)	Fully dependent	57.0(774)

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Christians & Others	18.9(257)	Partially dependent	28.0(392)
Caste		Not dependent	14.1(191)
SC/ST	8.2(111)	Role in decision-making changed after 60 years	
OBC	56.3(764)	Improved	10.1(138)
Others	35.5(482)	Remained the same	79.1(1073)
Marital Status		Declined	10.8(146)
Currently Married	56.4(766)	Self rated Health	
Widowed/widowers/Se parated/deserted	42.2(573)	Poor	33.7(457)
Single	1.3(18)	Moderate	52.8(716)
Education		Very good	13.6(184)
Illiterate	19.9(270)	Proper sleep at night	
Lower Primary (1-4)	24.8(336)	Yes	67.1(911)
Upper Primary (5-7)	19.6(266)	No	32.9(446)
8-10	23.9(325)	Feeling of unhappy or depressed	
= 11	11.8(160)	No	65.9(894)
Current Occupational Status		Yes	34.1(463)
Working	15.0(196)	Any risky health behaviour	
Not Working	52.0(1161)	Yes	24.2(238)
No. of children born		No	75.8(1029)
No children	3.8(51)	Wealth Index	
1-2	27.3(371)	Poor/Poorest	17.1(231)
3-4	38.5(522)	Moderate	24.2(329)
= 5	30.4(413)	Rich/Richest	58.7(797)
Total	100(1357)	Total	100.0(1357)

One third of the elderly fall in the lowest income group (income less than Rs 12,000 per annum) and about 18 per cent of the elderly fall in the highest income group (annual income greater than Rs 50,001. About 14 per cent of the elderly are financially fully independent but more than half (57%) of the aged are financially fully dependent of others and about one third are partially dependent. Regarding the change of role in decision-making after 60 years in various activities like arrangement of social and religious events, providing gifts to relatives, buying household items and buying and selling property one out of ten elderly persons reported that they have improved their role in decision-making in the above activities, a same proportion reported that they have declined their decision-making roles in the above activities after age 60 and above and the remaining reported that they have

not felt any change in the role of decision-making. The self rated current health status assessment of the respondents showed that only 13 per cent of the elderly rated their health status as excellent or very good, one third of the aged rated their health status as poor and the remaining (nearly 53%) elderly self rated their current health as moderate. About one third of the aged reported that they did not get proper sleep at night and thirty four per cent of the respondents felt unhappy or depressed. The risky behaviors like use of substances related to smoking, chewing tobacco and consumption of alcohol have direct impact on the health status. About one fourth of the respondents reported that they had the habit of using any of the above mentioned three risky substances. Wealth Index of the elderly shows that 17 per cent of the aged persons come under the poor or poorest category, 24 per cent come under the middle category and around 59 per cent of the elderly come under the rich or richest category.

Morbidity Patterns and the Functional Health Limitations among the Elderly in Kerala

The presence of acute and chronic morbidity and short and long standing illness is an important aspect of health status of the elderly as morbidity increases advancing age and both prevalence and incidence are likely to be high. The quality of health of the elderly depends greatly on their health status and functionality. The functional health limitations and prevalence of morbidity (that is acute and chronic) and disabilities which are self rated and reported by the respondents are discussed here.

Morbidity among Elderly

The BKPAI survey collected the details of prevalence of acute and chronic morbidity among elderly in Kerala. Acute morbidity is defined as any event of sickness or ill health reported during 15 days prior to the survey. About 15 per cent of the elderly reported that they were sick during the fifteen days prior to the survey. Out of the total 1,357 elderly, 205 persons reported that they had suffered different kinds of acute ailments like fever, respiratory ailments, asthma, disorder of joints and pain, accidents, cardiovascular diseases, gastro-intestinal diseases and others. Fever (35%) is the most common illness reported by the elderly followed by respiratory disorders

(12.5%) and asthma (12.2%). Other diseases reported by the elderly are disorders of the joints and pain, accidents and cardiovascular diseases were reported by less than ten per cent.

Table 2
Percentage distribution of prevalence of any acute morbidity by background characteristics of elderly in Kerala

<i>Characteristics</i>	<i>Prevalence of any acute morbidity</i>		
	<i>No</i>	<i>Yes</i>	<i>Total</i>
Age			
60–69	50.3	9.5	59.8
70–79	24.2	3.5	27.7
80+	10.3	2.1	12.5
Sex			
Male	36.0	5.7	41.6
Female	48.9	9.4	58.4
Residence			
Rural	42.1	8.5	50.6
Urban	42.8	6.6	49.4
Religion			
Hindu	50.4	8.0	58.4
Muslims	18.2	4.4	22.6
Christians	16.3	2.7	19.0
Caste**			
SC/ST	6.4	1.8	8.2
OBC	46.9	9.4	56.3
Others	31.6	3.9	35.5
χ^2	11.793		
Educational status**			
Illiterate	16.0	3.9	19.9
1–7	37.4	7.0	44.4
8+	31.5	4.2	35.7
χ^2	8.759		
Current Marital Status			
Currently married	48.9	7.6	56.4
Others	36.0	7.5	43.6
Current occupational status			
Working	40.7	7.3	48.0

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Not working	44.2	7.8	52.0
Annual Income of the elderly			
No income	32.3	6.9	39.1
< 50,000	34.9	6.4	41.3
= 50,001	17.8	1.8	19.6
No. of living Children			
= 2	66.4	11.0	77.4
= 3	18.5	4.1	22.6
Current living arrangements			
Alone/spouse only	14.2	1.7	15.9
Others	70.7	13.4	84.1
Wealth Index***			
Poor/poorest	14.4	2.6	17.0
Middle	18.3	5.9	24.2
Rich/richest	52.2	6.6	58.8
χ^2	28.740		
Self Rated Health Status***			
Poor	25.6	8.1	33.7
Moderate or Good	59.3	7.0	66.3
χ^2	41.009		
Risky habits			
Yes	65.4	10.4	75.8
No	19.5	4.7	24.2
Total Sample Size	84.9 (1152)	15.1(205)	100(1357)

Prevalence of acute morbidity by back ground characteristics of the elderly (Table 2) shows that the proportion of prevalence of acute illness slowly decreases according to the increase in age. The morbidity prevalence proportion of acute illnesses is higher among female elderly than male. The prevalence rate of acute morbidity is higher among elderly from rural areas, belonging to the religious group of Hindus, among other backward communities, elderly who were educated up to primary level and elderly who had less than three children. Elderly living alone and living with spouse have less prevalence of acute morbidity. The morbidity load is higher among elderly belonging to the highest wealth index than the lowest category. Also the prevalence load of acute morbidity is higher among the elderly who had the risky

behaviours. Over all about 86 per cent of the elderly received treatment for their acute morbidity.

Chronic ailments are illnesses suffered over the long term and data on chronic morbidities among the elderly was collected in the survey. The prevalence of chronic morbidity among elderly (Table 3) shows that hypertension was the most widely prevalent illness (40.3%) followed by diabetes (29.0%), cataract (21.3%), heart disease (16.1%), arthritis (15.2) and asthma (allergic respiratory disease) (14.2%).

Table 3
Percentage distribution of prevalence of any Chronic morbidity by background characteristics of elderly in kerala

Characteristics	Prevalence of any chronic morbidity		
	yes	No	Total
Age**			
60-69	13.1	46.7	59.8
70-79	3.8	23.9	27.7
80+	1.3	11.1	12.5
χ^2	19.725		
Sex			
Male	7.4	34.3	41.6
Female	10.9	47.5	58.4
Residence			
Rural	9.3	41.3	50.6
Urban	9.0	40.4	49.4
Religion			
Hindu	11.9	46.6	58.4
Muslims	4.1	18.5	22.6
Christians	2.3	16.7	18.9
Caste**			
SC/ST	2.2	6.0	8.2
OBC	10.9	45.4	56.3
Others	5.2	30.4	35.5
χ^2	10.521		
Educational status			
Illiterate	4.6	15.3	19.9
1-7	7.4	36.9	44.4
8+	6.3	29.5	35.7
Current Marital Status			
Currently married	11.1	45.3	56.4

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Others	7.1	36.4	43.6
Current occupational status			
Working	9.7	38.2	48.0
Not working	8.5	43.5	52.0
Annual Income of the elderly			
No income	6.1	33.0	39.1
< 50,000	9.3	32.0	41.3
= 50,001	2.9	16.7	19.6
No. of living Children			
= 2	15.0	62.4	77.4
= 3	3.0	19.3	22.6

Table 4
Percentage distribution of prevalence of any Chronic morbidity by background characteristics of elderly in Kerala

Characteristics	Prevalence of any chronic morbidity		
	yes	No	Total
Current living arrangements			
Alone/spouse only	3.2	12.7	15.9
Others	15.1	69.0	84.1
Wealth Index			
Poor/poorest	4.2	12.8	17.0
Middle	4.7	19.5	24.2
Rich/richest	9.4	49.4	58.7
Self Rated Health Status***			
Poor	2.6	31.1	33.7
Moderate or Good	15.7	50.6	66.3
χ^2	58.560		
Risky habits**			
Yes	12.8	63.0	75.8
No	5.5	18.7	24.2
χ^2	5.127		
Total Sample Size	18.3(248)	81.7(1109)	100.0(1357)

*** P < 0.001, ** P < .011

Prevalence of any chronic disease by background characteristics of elderly shows (Table 4) that the proportion of prevalence of any chronic morbidity is higher (13.1%) among 60–69 age groups than the other two age groups. Female elderly have higher proportion of prevalence of any chronic ailment than their male counterparts. Elderly

belonging to Hindu community and among the caste groups 'other backward community' have higher load of prevalence of chronic morbidity than the others. Vulnerability to and prevalence of any chronic disease of elderly among currently married is higher than the elderly belonging to the group of single/widowed/widowers/divorced and separated. The prevalence proportion of at least one chronic disease among the elderly who were living with spouse, children and grand children is five times higher than that of elderly living as single/living with spouse only. The load of chronic morbidity is higher among elderly who have the risky behaviours like smoking, consuming alcohol and chewing tobacco, panparag and other risky substances than non users. A majority of the elderly sought treatment for the chronic morbidities except for cataract.

Disability among Elderly in Kerala

BKPAI survey collected the information on some disability with respect to vision, speech, hearing, walking, chewing and memory. Table 5 presents the distribution of elderly by their disability. The prevalence of disability shows that about one third of the elderly have problem related to vision (vision impairment), nearly one fifth of the aged have problem of hearing, about 27 per cent of the elderly have some problem disability in Walking, about 18 per cent of the elderly persons have problem in chewing, about one third of the aged have some difficulty in recollecting things (memory problem) and about five per cent of the elderly have problem in speaking. About four fifth of the elderly have at least one disability problem.

Table 5
Distribution of Elderly by disabilities

<i>Type of disability</i>	<i>No.</i>	<i>Percentage</i>
Vision		
Yes	987	72.7
No	370	27.3
Hearing		
Yes	255	18.8

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No	1,102	81.2
Walking		
Yes	370	27.3
No	987	72.7
Chewing		
Yes	242	17.8
No	1,115	82.2
Speaking		
Yes	71	5.2
No	1,286	94.8
Memory		
Yes	278	20.5
No	1,679	79.5

Functionality among Elderly in Kerala

Population around the world is growing old at high rate with increasing life-expectancy. The challenging problems, functional status, behavioural risk factors, healthcare utilization, social circumstances are imperative for public health intervention with elderly people. Measuring the prevalence of functional disability among older people is extremely important. Functional status of individuals was assessed in terms of their ability to perform some important activities of daily living-instrumental activity of daily living (ADL-IADL) without help, e.g. activities like dressing, mobility (transferring from bed or chair), toileting, taking bath, feeding and continence (controlling bladder and bowel movements) for ADL and the IADL involve a more complex set of functioning abilities including the ability to use the telephone, go shopping, prepare meals, do house-keeping, do laundry, travel, take responsibility for one's own medication and ability to handle finance. The respondent were asked about their level of independence in carrying out the six different types of above mentioned ADL activities covering physical domain of functionality.

Table 6
Elderly need full/partial assistance/no assistance by ADL

<i>ADL Activities</i>	<i>Do not require assistance</i>	<i>Require partial/full Assistance</i>	<i>Total</i>
Bathing	91.5(1242)	8.5(115)	100.0(1357)
Dressing	95.1(1291)	4.9(66)	100.0(1357)
Going Toilet	95.4(1294)	4.6(63)	100.0(1357)
Mobility	96.0(1303)	3.9(54)	100.0(1357)
Continence	97.0(1317)	3.0(40)	100.0(1357)
Feeding	98.1(1331)	1.9(260)	100.0(1357)

Table 6 shows the abilities of ADL activities reported by the elderly. About 8.5 per cent of the elderly need full support or partial support for bathing, dressing, going toilet, mobility, continence and feeding are about 8.5 per cent, about 5 per cent, 4.6 per cent, 3.9 per cent, 3.0 per cent and around 2 per cent respectively.

Table 7
Percentage distribution of elderly by the level of independence in carrying out any of the ADL activities by background characteristics

<i>Characteristics</i>	<i>Need partial/full support to perform any of the ADL activities</i>		
	<i>Yes</i>	<i>No</i>	<i>Total (N)</i>
Age***			
60-69	2.8(37)	57.0(775)	59.8(812)
70-79	3.2(44)	24.5(332)	27.7(376)
80+	3.9(53)	8.5(116)	12.5(169)
χ^2	92.283		
Sex***			
Male	2.4(32)	39.3(533)	41.6(555)
Female	7.6(102)	50.8(690)	58.4(792)
χ^2	20.502		
Residence			
Rural	4.6(63)	46.0(624)	50.6(687)
Urban	5.3(71)	44.1(599)	49.4(670)
Religion***			
Hindu	4.4(60)	54.0(733)	58.4(793)
Muslims	3.8(51)	18.9(256)	22.6(307)
Christians	1.7(23)	17.2(234)	18.9(257)
χ^2	18.653		

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Caste			
SC/ST	0.5(7)	7.7(104)	8.2(111)
OBC	6.5(87)	49.8(677)	56.3(764)
Others	2.9(40)	32.6(442)	35.5(482)
Educational status***			
Illiterate	3.3(45)	16.6(225)	19.9(270)
1-7	4.8(65)	39.6(537)	44.4(602)
8+	1.8(24)	34.0(461)	35.7(485)
χ^2	28.215		
Current Marital Status***			
Currently married	3.4(46)	53.1(720)	56.4(776)
Others	6.5(88)	37.1(503)	43.6(591)
χ^2	28.601		

Table 8

Percentage distribution of elderly by the level of independence in carrying out any of the ADL activities by background characteristics

<i>Characteristics</i>	<i>Need partial/full support to perform any of the ADL activities</i>		
	<i>Yes</i>	<i>No</i>	<i>Total (N)</i>
Current occupational status			
Working	4.9(66)	43.1(585)	48.0(651)
Not working	5.0(68)	47.0(638)	52.0(706)
Annual Income of the elderly***			
No income	5.2(71)	33.9(460)	39.1(531)
< 50,000	3.3(44)	38.0(516)	41.3(560)
= 50,001	1.4(19)	18.2(247)	19.6(266)
χ^2	11.821		
No. of living Children***			
= 2	6.3(86)	71.0(964)	77.4(1050)
= 3	3.6(48)	19.0(259)	22.6(307)
χ^2	13.435		
Current living arrangements			
Alone/spouse only	0.4(6)	15.5(210)	15.9(216)
Others	9.5(128)	74.6(1,113)	84.1(1,141)
Wealth Index			
Poor/poorest	1.7(23)	15.3(208)	17.0(231)
Middle	2.7(36)	21.6(293)	24.2(329)
Rich/richest	5.5(75)	53.2(722)	58.7(797)

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Self Rated Health Status***			
Poor	7.2(98)	26.5(359)	33.7(457)
Moderate or Good	2.7(36)	63.7(814)	66.3(900)
χ^2	99.701		
Acute illness***			
Yes	7.2(98)	77.7(1054)	84.9(1152)
No	2.7(36)	12.5(169)	15.1(205)
χ^2	13.849		
Chronic illness**			
Yes	8.8(120)	72.9(989)	81.7(1109)
No	1.1(14)	17.2(234)	18.3(248)
χ^2			
Disability***			
Yes	9.5(129)	72.9(989)	82.4(1118)
No	0.4(5)	17.2(234)	17.6(239)
χ^2			
Risky habits			
Yes	1.7(23)	22.5(305)	24.2(328)
No	8.2(111)	67.6(918)	75.8(1029)
Total Sample Size	9.9(134)	90.1(1223)	100(1357)

*** P < 0.001, ** P < .01

In Kerala, about 10 per cent of the elderly reported that they could perform any of the above six ADL activities without full or partial assistance. The functional limitations among elderly increases with increase in age. The study shows that females are more vulnerable than males in case of functional limitations. The proportion of elderly women needing full or partial assistance to perform the ADL activities is three times higher than that of their counterparts (male elderly). A slight difference is seen among rural and urban residence, the elderly need for full or partial assistance for ADL is slightly higher in urban areas than in rural areas. The proportion of elderly who need full or partial assistance to perform ADL activities is higher among elderly belonging to Hindus, OBC category, and have primary level of education, single/widowed/widowers/divorced/separated group, than their counterparts. The elderly having low income are more vulnerable than the higher income group. The level of independence in ADL activities is found to be higher among the elderly who are living alone and living with spouse only than those who are living

with others. Similarly, the proportion of elderly needing full or partial assistance for ADL is higher among those who self rated the health status as poor, who have acute and chronic illnesses, having more disability than their counterparts.

Regarding the involvement of IADLs, in Kerala about 34.7 per cent of the elderly are actively participating in all the eight activities taken for the analysis and about four per cent of the elderly are not participating in any of the IADL activities (Table 9). About 19 per cent of the elderly can perform one to four activities and two fifth of the elderly can perform 5 to seven activities.

Table 9
Percentage distribution of elderly by performance of IADL activities

<i>IADL Activities</i>	<i>Per cent</i>	<i>No.</i>
Can perform no activity	4.0	54
Can perform 1 to 4 activities	19.0	258
Can perform 5 to 7 activities	42.3	574
Can perform all the 8 activities	34.7	471
Total	100.0	1,357

Age composition by performance of IADL activities shows that out of the total elderly who can perform all the eight activities, about 27.6 per cent are under the age group 60–69 and only one per cent of them are aged 80 years and above (Table 3.4). About five per cent of female elderly more actively participated in all the eight IADL activities and residential status shows that 2.5 per cent point of urban residents are more engaged in all the IADL activities than their rural counterparts. Elderly from Hindu community and elderly belonging to OBC category are better in performance of all the IADL activities than other categories. Elderly who are belonging to illiterate group show poorer performance in all the IADL activities than the other educational groups. Elderly who are currently married and living with spouse, children and others have better performance in all the IADL activities than their counterparts. Wealth Index of the elderly by performance in all the IADL activities shows that elderly who come under the rich and richest group provide better performance than the other groups. Elderly having functional disability and risky behaviours show low performance in the IADL activities. Analysis shows

that presence of chronic and acute illnesses also reduces the performance of IADL activities considerably among elderly.

Table 10
Percentage distribution of elderly by IADL activities according to their background characteristics

Characteristics	Perform all of the IADL activities		
	Yes	No	Total (N)
Age***			
60–69	27.6(375)	32.2(437)	59.5(812)
70–79	6.0(82)	21.7(294)	27.7(376)
80+	1.1(14)	11.4(155)	12.5(169)
χ^2	140.342		
Sex			
Male	15.1(205)	26.5(360)	41.6(565)
Female	19.6(266)	38.8(526)	58.4(792)
Residence			
Rural	16.1(219)	34.5(468)	50.6(687)
Urban	18.6(252)	30.8(418)	49.4(670)
Religion***			
Hindu	21.0(285)	37.4(508)	58.4(793)
Muslims	5.4(73)	17.2(234)	22.6(307)
Christians	8.3(113)	10.6(144)	18.9(257)
χ^2	27.145		
Caste			
SC/ST	2.7(37)	5.5(74)	8.2(111)
OBC	16.4(223)	39.9(541)	56.3(764)
Others	15.5(211)	20.0(271)	35.5(482)
Educational status***			
Illiterate	3.2(43)	16.7(227)	19.9(270)
1–7	12.7(173)	31.6(426)	44.4(602)
8+	18.8(255)	16.9(230)	35.7(485)
χ^2	112.267		
Current Marital Status***			
Currently married	23.2(315)	33.2(451)	56.4(766)
Others	11.5(156)	32.1(435)	43.6(591)
χ^2	32.402		
Current occupational status			
Working	17.9(243)	30.1(408)	48.0(651)
Not working	16.8(228)	35.2(478)	52.0(706)
Annual Income of the elderly***			

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No income	12.4(168)	26.8(363)	39.1(531)
< 50,000	13.1(178)	28.2(382)	41.3(560)
= 50,001	9.2(125)	10.4(141)	19.6(266)
χ^2	21.356		
No. of living Children***			
= 2	27.6(402)	47.8(648)	77.4(1050)
= 3	5.1(69)	17.5(238)	22.6(307)
χ^2	27.617		
Current living arrangements ***			
Alone/spouse only	7.4(101)	8.5(115)	15.9(216)
Others	27.3(370)	56.8(771)	84.1(1141)
χ^2	15.920		
Wealth Index			
Poor/poorest	4.6(62)	12.5(169)	17.1(231)
Middle	7.4(100)	16.9(229)	24.2(329)
Rich/richest	22.8(309)	36.0(488)	58.7(797)
Self Rated Health Status***			
Poor	8.2(111)	25.5(346)	33.7(457)
Moderate or Good	26.5(360)	39.8(540)	66.3(900)
χ^2	34.095		
Acute illness			
Yes	29.6(401)	55.3(751)	84.9(1152)
No	5.2(70)	9.9(135)	15.1(205)
Chronic illness			
Yes	27.5(373)	54.2(736)	81.7(1109)
No	7.2(98)	11.1(150)	18.3(248)
Disability**			
Yes	27.6(347)	54.8(744)	82.4(1118)
No	7.1(97)	10.55(142)	17.6(239)
χ^2	4.341		
Risky habits			
Yes	7.4(100)	16.8(228)	24.2(328)
No	27.3(371)	48.5(655)	75.8(1029)
Total Sample Size	34.7(471)	65.3(886)	100.0(1357)

*** P < 0.001, ** P < .01

Conclusion and Suggestions

Elderly persons, being one of the most vulnerable groups of the society have more chances of chronic disease, infections, as well as disabilities. This highlights the need to study the prevalence of physical disability and functional limitation, and the prevalence of

morbidity among the elderly population in Kerala. The aims of the present study are to understand the background characteristics of the elderly and to study the prevalence of morbidity level, disabilities and the functional health limitations among elderly in Kerala. Survey on Building Knowledge base on Population Ageing in India (BKPAI) conducted by United Nations Population Fund and its collaborating institutions – Institute for Social and Economic Change (Bangalore), Institute of Economic Growth (Delhi) and Tata Institute of Social Sciences (Mumbai) collected the details of socio-economic, demographic and health status of elderly at household level. A total of 1,357 elderly were taken for the analysis, out of which 565 males and 792 females.

The State Kerala has the highest proportion of the elderly population in India. Challenging morbidity pattern, break down of joint family system and growing number of nuclear families, increase in life expectancy, urbanization and migration of adult members who are responsible to look after the elderly, etc. brought out several issues and challenges in Kerala, especially among the elderly population. In Kerala, females are predominant among the elderly population and with the increasing male – female gaps in longevity the proportion of elderly females in the State is expected to increase in future. Due to this high longevity among females, they have to spend a considerably long period of their lives as widows and this may increase the vulnerability among women. So the State or Central Government has to increase the care provision according to the increasing demand of elderly either through institutional or through home based support system. The morbidity load and disability levels among the elderly and their functionality limitations are also quite high in Kerala. One out of every ten elderly in the State requires some assistance to perform their daily activities such as feeding, bathing, dressing toilet use, etc. The disability related to vision is very high among elderly in Kerala and disabilities like hearing and walking are also high among them. The morbidity load of lifestyle diseases and other non communicable diseases are very high in Kerala not noticeable in any of the other States in India. Hypertension, arthritis, diabetes, heart diseases, cataract, asthma, etc. are reported to be very high among elderly in Kerala. This will become a serious challenge to the public health system in the State. The Government (State or Central) should

understand and identify the needs of the elderly and assist them through providing the aids to functionally disabled and strengthen the geriatric care services at PHC level by providing more staff, necessary medicines and infrastructural facilities for the benefit and upliftment of the elderly.

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Altruism, Happiness and Health among Elderly People

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ABSTRACT

The purpose of this study was to explore the relationship among altruism, happiness and general health of elderly people. The sample comprised of 153 (M = 84, F = 69) elderly people, age ranging between 60 to 75 years. The data were collected using Self Report Altruism Scale, Oxford Happiness Questionnaire and GHQ – 30. The results revealed significant gender difference in the scores of altruism but no statistically significant differences were found in the scores of happiness and health. Further results indicated that among elderly people altruism and happiness were positively correlated with each other, whereas altruism and happiness were negatively correlated with health. It was also found that altruism and happiness both predicted health of the elderly people but happiness was found to be stronger predictor of health.

Key Words: Altruism, Elderly, Happiness and Health.

During the last two decades the phenomenon of population ageing is becoming a major concern all over the world, for both developed and developing countries. But the problems arising out of it will have varied implications for underdeveloped, developing and developed countries. For a developing country like India, this may

pose mounting pressures on various socio-economic fronts, multiple medical and psychological problems including pension outlays, saving levels, health care, well-being, etc. There is an emerging need to pay greater attention to ageing-related issues and dealing with the ageing society.

Old age consists of ages nearing or surpassing the average life span of human beings. Government of India adopted 'National Policy on Older Persons' and it defines 'senior citizen' or 'elderly' as a person who is of age 60 years or above. According to Erikson's theory human personality is developed in a series of eight stages that take place from the time of birth and continue throughout an individual's complete life. In the theory old age has been characterized as a period during which a person focuses on reflecting back on his life. Those who are unsuccessful during this phase feel that their life has been wasted and experience many regrets. Those who feel proud of their accomplishments feel a sense of integrity. Successfully completing this phase means looking back with few regrets and a general feeling of satisfaction. These individuals attain wisdom, even when confronting death. The way a person adapts and copes, reflects his aging process on a psycho-social level.

The above description indicates that there is a need to explore what measures would ease the burden of ageing in Indian society and what initiatives could mitigate the burden borne by the aged and the society. This question compelled the researcher to think how psychosocial resources can help in improving the well-being of older adults. The literature reveals that altruistic emotions and behaviors are associated with greater well-being, health and longevity of elderly. So, the researcher planned the study to explore the concepts of altruism, happiness and health among the elderly people of India.

Certain factors predispose to experience emotional empathy, these include having a pro-social personality profile (Oliner & Oliner, 1988) and having internalized pro-social values through the process of socialization (Staub, 1974). The foremost understanding of altruism is that it is regarded as doing something for others without a motive of self interest or self gain and one does not have a stake in the outcome of the act. Behavior is motivated by altruism. Altruistic motivation is defined by the intention of improving another person's situation, for

that reason alone and not for ulterior self serving motives. The altruistic motive is distinct from egoistic motives which may also energise helpful behavior. Altruistic motivation is evoked in many instances by empathic emotion rather than the egoistic motives (Batson, *et al.*, 1991).

In a study it was found that formal volunteering moderated the loss of a sense of purpose among older adults who had experienced the loss of major role identities, such as wage-earner and parent (Greenfield & Marks, 2004). In another study it was found that participation in community service was more strongly correlated with life satisfaction for retirees than for those individuals who continued to work for pay (Harlow & Cantor, 1996). New York community found that those women who had volunteered on an intermittent basis from the time they married until the age of 55 had higher functional ability and were more likely to occupy multiple roles in later years, indicating greater social integration than their counterparts. At the same time, a negative relation was found between paid work, care giving and health (Moen, *et al.*, 1992). Therefore, while studying altruism among elderly people happiness was the other important concept to be studied.

Diener used the term subjective well being as synonym for happiness. Modern western psychology has focused primarily on a post materialistic view of happiness (Diener, *et al.*, 2002, 2009) that emphasizes pleasure, satisfaction and meaning in life. Seligman (2002) suggested that a pleasant and meaningful life can be built on the happiness that results from using the psychological strengths. Happiness is a positive emotional state that is subjectively defined by each person. Aristotle believed that eudaimonia or a lifelong pursuit of meaningful developmental goals was the key to the good life (Waterman, 1993). Theories of happiness have been divided into three types: Need/goal satisfaction theories, process/activity theories and genetic/personality predisposition (Diener, *et al.*, 2009).

Research shows that unselfish individuals will find life to be more meaningful, will usually be happier than their selfish counterparts, have reduced mortality rates and often experience better mental as well as physical health (Van Willigen, 2000). There is, however, an obvious caution that those who allow themselves to be overwhelmed by care giving often suffer from the stressful burden of care (Ibid.).

Studies conclude that an individual can live a generous life, without concern for reputational gains and as a by-product discover deeper relationships, happiness, health and even longevity (Post, 2005). A strong correlation exists between the well-being, happiness, health and longevity of people who are emotionally and behaviorally compassionate (Bergsma, *et al.*, 2009). Another study found that, in general, volunteers report greater life satisfaction and better physical health than do non-volunteers, and their life satisfaction and physical health improves at a greater rate as a result of volunteering. It was also found that older volunteers experience greater increases in life satisfaction and greater positive changes in their perceived health as a result of their volunteer activities than do younger volunteers (Van Willigen, 2000). These studies compelled to include the concept of health along with the concepts of altruism and happiness in the study.

Any deviation from a person's normal self-defined healthy state of feeling and functioning suggests that he/she is not healthy. The World Health Organization adopted a comprehensive view of health in 1946, stating that health is the state of complete physical, mental and social well-being and is not merely the absence of disease or infirmity (WHO, 1946). People commonly think about health in terms of an absence of subjective symptoms of disease or injury, such as pain or nausea or objective signs that the body is not functioning properly such as measured high blood pressure (Birren & Zarit, 1985; Thoresen, 1984). But illness and wellness are not entirely separate concepts. They overlap, with increasing degrees of wellness and of illness varying along a continuum with a neutral status in middle while at the opposite ends are optimal wellness and death (Sarafino, 2002). Thus, the term health refers to a range of positive states of physical, mental and social well being and not just the absence of injury or disease.

The exhaustive literature reveals large number of studies related to altruism and health. A study followed a group of older couples for five years and found that individuals who reported providing substantial forms of help to friends, relatives, and neighbors reduced their risk of dying by about one half during the study period, compared with individuals who reported providing no help to others. In addition, people who reported providing high amounts of emotional support to their spouse were also about half as likely to die

during the study period, compared with people who reported providing relatively lower amounts of emotional support. Receiving support had no influence on mortality but giving to others accounted for some of the health benefits of social contact.

Another study examined whether giving is protective for widows (Brown, *et al.*, 2003). Results demonstrated that (a) widows who gave instrumental support to others were less likely to have their grief develop into depressive symptoms and those who increased their amount of giving had lower levels of depressive symptoms as compared to their non-altruistic counterparts. Similarly results of another survey of a large, ethnically diverse sample of older adults showed no association between receiving social support and improved health; however, the study did find that those who gave social support to others had lower rates of mortality than those who did not, (Brown, *et al.*, 2005). Similar study found that providing support had a stronger relationship with longevity than receiving support from others (Brown, *et al.*, 2003). The data from the Longitudinal Study of Aging on respondents 70 years or older, found that those individuals who volunteer had lower mortality rates than those who did not. Results also indicated that the positive effect of volunteering was stronger for those in good health (Sabin, 1993; Musick, *et al.*, 1999). Volunteering was found to contribute more to lower mortality rates than high religious involvement or perceived social support (Oman, *et al.*, 1999). There did not appear to be any additional benefits to health as the number of volunteer hours increased beyond 100 hours (Lum & Lightfoot, 2005; Luoh & Herzog, 2002). Another study of 65 and older found that the positive effect of volunteering on physical and mental health was due to the personal sense of accomplishment that an individual gains from his or her volunteer activities (Herzog, *et al.*, 1998). One study found that volunteering among older adults (age 60 and over) provided benefits to both physical and mental health, while similar correlations were not found for mid-life adults who volunteer. It was also found that while depression is a barrier to volunteer participation in mid-life adults, it serves as a catalyst for volunteering among older adults, who may seek to compensate for role losses and attenuated social relations that occur with aging (Li & Ferraro, 2006). The

existing literature indicates links between aspects of social network functioning and health outcomes. It is generally believed that networks that are larger or provide greater instrumental and emotional support contribute to improved health and, perhaps, greater longevity. Recently, it has been suggested that giving as well as receiving social support may be of benefit. In another study it was found that both kin and non kin giving was associated with improved health (Brown, *et al.*, 2005).

Impressive findings can be summarized from the above studies that have explored the relationship between volunteering and health. While these studies may differ in terms of their specific findings, they consistently demonstrate that there is a significant relationship between volunteering and good health; when individuals volunteer, they not only help their community but also experience better health in later years, whether in terms of greater longevity, higher functional ability, or lower rates of depression (Grimm, *et al.*, 2007).

The review of literature reveals that researches have been conducted to know the pattern of altruism, happiness and health in general, but very few researches were found that could explain the relationship among these three together. As stated in the beginning that major issues related to the elderly people in the country require attention, the present study was planned to explore the relationship among these three important concepts of positive psychology specifically with reference to elderly people.

The major objectives of the study were-

1. To investigate the role of gender on altruism, happiness and health among elderly people.
2. To know the inter correlation of altruism, happiness and health and
3. To investigate the impact of altruism, happiness on health among elderly people.

On the basis of above mentioned objectives, following hypotheses were formulated-

H₀: There is no gender difference on the measures of altruism, happiness and health among elderly people.

H₁: There is positive correlation among altruism, happiness and health of elderly people.

H₂: Altruism and happiness are predictors of health among elderly people.

Method

Sample

The sample was selected from urban society, residing in Delhi. Participants consisted of 153 randomly selected subjects 84 males and 69 females with age range from 60 to 75 years, who volunteered to participate in the study.

Tools

Three scales were used in the study. The description of the scales is as follows:

1. *Self-Report Altruism scale*: The scale was developed by Rushton, *et al.*, (1981). It was a 20 question self-report inventory in which participants choose between five categories ranging from 'never', 'once', 'more than once', 'often' to 'very often'. The questions were answered by selecting a category that conforms to the frequency with which participants carried out specific acts. Higher scores on this scale indicate higher frequency in executing specific acts. The reliability of the scale was assessed and yielded a significant inter-rater reliability of $r(78) = +0.51$ ($P < 0.01$) for the peer rated-SRA-scale altruism scores and $r(78) = +0.39$ ($P < 0.01$) for the peer-rated-global altruism measure. The internal consistency of the 20-item peer rating form was also calculated and found to be extremely high ($\alpha = 0.89$, $N = 416$). The correlation between peer-rated-SRA-scale altruism and peer-rated-global altruism was $r(86) = 0.54$ ($P < 0.001$). The validity of the SRA-scale was assessed by correlating it with the peer ratings. The correlations between the SRA-scale and peer-rated-SRA-scale altruism and peer-rated global-altruism were $r(86) = 0.35$ ($P < 0.001$) and $r(86) = 0.21$ ($P < 0.05$), respectively (Ibid.).

2. *The Oxford Happiness Questionnaire (OHQ)*: Questionnaire was developed by Hills and Argyle (2002) at Oxford University. OHQ consists of 29 items to be answered on a six-point Likert scales ranging from strongly disagree to strongly agree. Out of 29, 12 Items (1,5,6,10,13,14,19,23,24,27,28,29) were negatively scored. High scores imply higher degree of happiness. In a series of comparative tests between the OHI and the OHQ, the aggregate scores of both measures were strongly correlated, and both measures demonstrated high scale and item reliabilities. All cross-scale correlations between corresponding items were highly significant and for the large majority of items the correlations were strong. The construct validity of the OHI has previously been established by the associations of the measure with a variety of individual differences in trait and cognitive variables. These associations were compared for both the OHI and OHQ. All were equally and highly significant and, with the exception of an equal association with extraversion, those for the OHQ were stronger. In terms of construct validity, the OHQ appears to be the preferred measure (Hills & Argyle, 2002).
3. *General Health Questionnaire (GHQ-30)*: The scale was developed as a method to quantify the risk of developing psychiatric disorders. The instrument targets the inability to carry out the normal functions and the appearance of distress as well as to assess well-being in a person. GHQ-30 contained 30 statements reflecting the mental state (i.e. depressive moods, sleeping problems, and anxiety), social functioning and well-being, and coping abilities of the participant. The questionnaire included questions about the perceived overall health and perceptions of anxiety, sadness, helplessness, and loneliness. Fifteen of the statements were negatively worded and remaining 15 were positively worded. A four-point Likert-type scoring system was used for each statement, ranging from less than usual to much more than usual. The minimum score was 0 and the maximum score was 90. Higher scores reflect more declined mental health. Among the several versions of the GHQ, the GHQ-30 is shown to be the most stable and have the highest validity.

Procedure

All three questionnaires were prepared in Hindi as well as in English and integrated as one booklet. The participants were given appropriate separate instructions for all three questionnaires. According to the objectives of the study, the data were collected, scored and analyzed using SPSS-16.

Results

Table 1
Mean, SD and F-value on the measures of altruism, happiness and health among Elderly people

Variables		N	Mean	S.D.	F
Altruism	Male	84	37.92	15.67	9.381*
	Female	69	31.30	9.68	
	Total	153	34.94	13.67	
Happiness	Male	84	20.34	3.32	1.058
	Female	69	20.88	3.20	
	Total	153	20.58	3.27	
Health	Male	84	25.53	13.61	.903
	Female	69	27.65	13.82	
	Total	153	26.49	13.70	

* $p < .05$

Table 1 shows that on the measure of altruism, males ($M = 37.92$, $SD = 15.67$) scored higher than females ($M = 31.30$, $SD = 9.68$) and the difference was significant with respect to gender ($F = 9.381$, $p < .05$). Whereas on the measures of happiness and health no statistically significant differences were found.

Table 2
Pearson correlation among altruism, happiness and health

Measures	Altruism	Happiness	Health
Altruism	–	.321**	–.389**
Happiness	–	–	–.491**
Health	–	–	–

** $p < .01$

Table shows that altruism and happiness were positively correlated with each other, whereas the correlation between altruism and

health as well as happiness and health were found to be negative. All the correlations were highly significant.

Table 3
Summary table of Stepwise regression on altruism, happiness and health

Predictor variable	β	R	R square	Adjusted R square	R square change	F
Happiness	-.408	.548	.300	.291	.241	32.212**
Altruism	-.258				.060	

Criterion variable: Health

**p < .01

The summary table of stepwise regression revealed a highly significant model ($F=32.212$, $p<.01$) for the value of health, which explained 29.1 per cent of the variance (Adjusted $R^2 = .291$). In the model happiness ($\beta = -.408$) and altruism ($\beta = -.258$) emerged as the predictors for health.

Discussion

Global Age Watch Index (2013) released the rankings, based on data from the World Health Organization and other agencies on older people's incomes, health, education, employment and their environments. According to this survey report, India stands a dismal 73rd in the list of 91 countries (UN Report, 2013). External circumstances affect well-being, but actions and attitudes also have considerable influence. Interventions which encourage positive actions and attitudes have an important role to play in enhancing well-being.

Keeping this in view present study was designed to explore the relationship among altruism, happiness and health in elderly people of India. For this purpose, three hypotheses were formulated. The first hypothesis stated that there will be no gender difference on the measures of altruism, happiness and health of the elderly people. The analysis revealed significant gender difference between males and females on the measure of altruism, whereas in case of happiness and general health, no significant gender differences were found. On the basis of this result, it can be concluded that the null hypothesis was partially accepted. This indicates that the responses of elderly people

differed on the measure of altruism but were approximately same on the measures of happiness and health.

Due to lack of available relevant literature on gender effects of elderly people on altruism, happiness and health, no concrete explanation can be given. Possibly, demographic and psycho-social factors might be one of the reasons accounting for the obtained difference. Secondly, altruism is defined as doing something for others without a motive of self interest and also one does not has any stake in the outcome of the act, so according to this it might be possible that due to age factor, females avoid indulging in risk taking behaviors for the betterment of others. Besides this, helping depends on the kind of altruistic acts. Females of 60 and above age cannot volunteer helping others in every manner. They have certain limitations due to their age, lack of availability of resources, physical constraints, etc.

As the hypothesis was partially accepted i.e. no gender differences were found on the measures of happiness and health among elderly people. Due to lack of available relevant literature the possible explanations are that according to psychologists, happiness has been defined to be subjective feeling, therefore gender alone cannot influence happiness. There are lot many other factors that might influence happiness such as the economic status, family preferences, personality, coping and adjustment strategies, life orientation, social recognition, etc. Possibly, in the age of 60 and above, the life preferences of elderly people might dominate in comparison to their gender, so this is why no gender differences were found in the measures of happiness.

Similarly, health refers to a range of positive states of physical, mental and social well-being and not just the absence of injury or disease. Therefore, similar to happiness, it might be that health is also not influenced by gender alone to the extent other factors influence it. Possibly, the physical health depends upon the economic status, availability of medical facilities, etc. whereas mental and social well-being depends on the factors similar to happiness. Therefore these factors might be the reason why gender based differences were not found among elderly people.

Further it was found that there was significant positive correlation between altruism and happiness. It implies that those who help others are happier. Researchers concluded that helping others leads to higher levels of happiness though the existing evidence only weakly supports this causal claim. Happier people give more and giving makes people happier, such that happiness and giving may operate in a positive feedback loop (with happier people giving more, getting happier, and giving even more). While offering donors monetary or material incentives for giving may undermine generosity in the long-term, the preliminary research suggests that advertising the emotional benefits of prosocial behavior may leave these benefits intact and might even encourage individuals to give more (Anik, *et al.*, 2012). It has also been found that human beings around the world derive emotional benefits from using their financial resources to help others.

Altruism, including kindness, generosity, and compassion are keys to the social connections that are important for happiness. Research finds that acts of kindness can boost happiness in the person doing the good deed. The probable reason could be that being generous leads to perceive others more compassionately. Being kind to others can start a chain reaction of positivity, promotes a sense of connection with others, which is one of the strongest factors in increasing happiness. Being generous helps to appreciate and feel grateful for one's own good fortune, it boosts the self-image, helps to feel useful and gives ways to use the strengths and talents in a meaningful way. Most psychologists accept that helping others reduces aversive arousal, avoids guilt, shame or social punishment, and obtains praise, honor, sense of pride or personal joy that lead person with feelings of happiness (Batson, *et al.*, 1991). Being kind and compassionate is linked to greater happiness, greater levels of physical activity in old age and longevity.

The other hypothesis which stated to obtain a positive correlation among altruism, happiness and health of elderly people was also partially accepted as correlation between altruism and health were found to be significantly negative whereas significant negative correlation was found between happiness and health also. Some of the

studies show that if people get overextended and overwhelmed by helping tasks, as can happen with people who are caregivers to family members, their health and quality of life can rapidly decline. It seems being generous from an abundance of time, money, and energy can promote well-being but being sacrificial quickly depletes (Post, 2005). This seems to be a good argument for communities sharing the burden for everyone's benefit.

Similarly, happiness is generally considered a source of good outcomes. Researchers have highlighted the ways in which happiness facilitates the pursuit of important goals, contributes to vital social bonds, broadens people's scope of attention, and increases well-being and psychological health. However, happiness is not always a good thing. The review suggests that the pursuit and experience of happiness might sometimes lead to negative outcomes. Cumulatively, research suggests that although happiness is often highly beneficial, it may not be beneficial at every level, in every context, but the majority of the existing literature concludes contradictory findings in comparison to the findings of the present study. A study found that psychological well-being was associated with flexible and creative thinking, pro-social behavior, and good physical health. Similarly, another study found that altruism and cognitive reserve (CR) were associated with better health and well-being. Another study of the longitudinal data found a positive relationship between volunteering activities and better health outcomes among adults over the age of 60, including higher levels of self-reported health and physical functioning, and lower levels of depression.

Further inferential analysis revealed that happiness and altruism were predictors of health, happiness being a stronger predictor of health. The findings highlight the value of altruistic attitudes as important additional predictors, along with happiness in fostering health in old age. The last hypothesis stated that altruism and happiness will predict health among elderly people. The obtained F value was highly significant which shows that the model hypothesized in the beginning was found to be appropriate. This indicates that among elderly people happiness and altruism both are influential, wherein the role of happiness is more effective. As stated earlier health

not only refers to the absence of disease or injury but is also influenced by physical, mental and social factors. Similar findings were obtained in the present study also. Therefore, happiness and altruism together contribute to the health of elderly people.

On the basis of findings of the present study, it can be concluded that altruism and happiness play important role in the lives of elderly people with respect to their health. Therefore, specific measures must be taken to improve the levels of these factors among elderly people as these are vital for the betterment of elderly people in all human societies.

Limitations & Suggestions

The study was conducted on a small sample of a limited population. Along with this the data in the study were collected using limited psychological variables and quantitative method only. Therefore, further studies could be planned by eliminating these limitations so that the findings can be generalized on a broader level.

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Socio-economic Problems of the Elderly Residing in Old Age Homes

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ABSTRACT

The purpose of the present study was to find out the health and social problems of 350 elderly (160 male and 190 females) age varying 60 years and above, residing in 15 old age homes situated in the four cities; three of Punjab namely Amritsar, Jalandhar, Ludhiana (Punjab) and Chandigarh (Union Territory). The data were collected through personal interviews and observations. An interview schedule, which included the personal information of the elderly respondents and questions regarding social and financial status was prepared for this purpose. Case studies and narratives were also obtained from the respondents. The data was analysed statistically. The findings of the study revealed that the socio-economic problems of the elderly are intensified by the factors such as absence of adequate income, change in social role and lack of social security.

Key words: Elderly, Socio-economic status, Health issues, Old age homes

Old age and wisdom are considered synonymous in the traditional Indian culture. Caring the elderly was never a problem. However, in the last two to three decades, the rapid pace of modernisation and urbanisation taking place in the country has been affecting the status of the elderly. With more nuclear families, long term care of the elderly and meeting their needs on the physical, social, financial

and health fronts is becoming very difficult. Living arrangement and care of the elderly is emerging as one of the major issues concerning the elderly. In future more and more elderly will have to live in old age homes in India in the context of emerging small family norm, strained relations among family members, and occupational mobility of children. When more and more elderly are choosing institutional homes, living away from their near and dear ones, it would be useful to study their adjustment patterns in the new environment, consequences on social and financial issues.

Population ageing has major economic and social implications. The old age dependency ratios around the world (the number of persons in the age-group 60 or more per 100 persons in the working age group) are already low in the developed countries and also in few developing countries. It is further estimated that it will continue to drop with ensuing financial pressures on support systems among the elderly persons. The poverty level in several developing countries is high among the elderly person, which is sometimes higher than that of the total population, particularly in nations with less developed social security systems. With advancement in health facilities people now lives longer almost everywhere as a result of which the prevalence of disability and non-communicable diseases increases (United Nations 2013).

By the age 58–60 mostly people are assumed to have fulfilled their various responsibilities, many of them involving money, for instance, education of the children, their marriages and may be their jobs. All this could possibly lead to a drain on the savings. With the oncoming of retirement and the limited pensions that they get, there may come a decline in the income and their financial status. Retirement could also result in poverty which could further lead to dependence on children/grandchildren/relatives during old age (Dandekar, 1995). Many old people have no economic source. They do not have enough savings to take care of their needs. Economic dependence on children makes life disturbing for them. The economic problems rise due to lack of savings, lack of even the primary necessities of life, lack of stable income and difficulty in settling with children.

Material and Methods

The present study is based on the data gathered from the old age homes of four cities; three of Punjab namely Amritsar, Jalandhar, Ludhiana and one from Union Territory of Chandigarh. A total of 350 elderly comprising of 160 men and 190 women aged 60 years and above, residing in the 15 old age homes, forms the sample of the present study

Majority of the old age homes in the present study were residential in nature, however, only two out of fifteen old age homes were providing both residential as well as day care facilities. Further, majority of the old age homes were private in nature while 3 of these were run by the government of Punjab. An enquiry about charges which the elderly have to pay for their stay in these old age homes reveals that majority of the homes do not charge anything, while some homes do have charges but provide free accommodation to those who are unable to make payment.

The data were collected through personal interviews, observations. A schedule which included the personal information of the elderly respondents and questions regarding social and financial status was also used in data collection. Case studies and narratives were also obtained. The primary data collected was coded, tabulated and percentage distribution of the sample was made for further analysis.

Results

Socio-Economic Characteristics of Old Age Home Inmates

Table 1
Distribution of the sample according to age and sex

<i>Characteristics</i>	<i>Men n (%)</i>	<i>Women n (%)</i>	<i>Total N (%)</i>
Sex	160 (45.7)	190 (54.3)	350 (100)
Age in years			
60 < 65	47 (29.3)	46 (24.2)	93 (26.6)
65 < 70	42 (26.3)	35 (18.4)	77 (22.0)
70 < 74	28 (17.5)	32 (16.8)	60 (17.1)
75 < 79	19 (11.9)	29 (15.3)	48 (13.7)
80 < 85	17 (10.6)	27 (14.2)	44 (12.6)
85 =	7 (4.4)	21 (11.1)	28 (8.0)
Total	160 (100.0)	190 (100.0)	350 (100.0)

Observing the age distribution of inmates of old age homes from Table 1, it can be noted that i) beginning from 60 years' age the number of inmates decreases with advancing age, ii) between 60 and 74 years of age there are a greater percentage of men as compared to women inmates, and iii) between 75 and 85+ years of age a greater percentage of women reside in old age homes as compared to the men.

Table 2
Marital status of the elderly

<i>Marital status</i>	<i>Men n (%)</i>	<i>Women n (%)</i>	<i>Total N (%)</i>
Unmarried	11 (6.8)	–	11 (3.1)
Divorced	22 (13.8)	7 (3.7)	29 (8.3)
Spouse Expired	108 (67.5)	164 (86.3)	272 (77.7)
Living with Spouse	19 (11.9)	19 (10)	38 (10.8)
Total	160 (100.0)	190 (100.0)	350 (100.0)

The background characteristics further reveal that majority of inmates are widows/widowers. However, 6.8 per cent of the elderly men had never married, while there were no women in the present sample who were unmarried. Table 2 also discloses that the percentage of widows (86.3%) is much higher than widowers (67.5%). Only about 10% of the married elderly are staying with their spouse in the old age homes. On the other hand, more male elderly (13.8%) were divorced as compared to Women elderly (3.7%).

Table 3
Educational status of elderly living in old age homes

<i>Education</i>	<i>Men n (%)</i>	<i>Women n (%)</i>	<i>Total N (%)</i>
Illiterate	43 (26.9)	120 (63.2)	163 (46.6)
Primary	37 (23.1)	47 (24.7)	84 (24.0)
Middle	30 (18.8)	12 (6.3)	42 (12.0)
Matric	23 (14.4)	6 (3.2)	29 (8.3)
Graduate	14 (8.7)	–	14 (4.0)
Post graduate & above	10 (6.2)	–	10 (2.8)
No formal education but can read and write	3 (1.9)	5 (2.6)	20 (2.3)
Total	160 (100.0)	190 (100.0)	350 (100.0)

It is usually understood that level of education has some effect on the attitudes as well as the economic status of an individual; it can thus be taken as a factor exercising some control over a person's support

system. As is evident from the Table 3, the percentage of illiterate women (63.2%) is greater as compared to men (26.9%). In the total sample about 46 per cent elderly reported that they did not have any education, while 24 per cent had reported primary educational attainment. Only Men accounted for 6.8 per cent graduates and postgraduates. About 2.3 per cent of the elderly belong to the category where they did not have any formal education but can read and write.

Table 4
Distribution of the sample according to religion, type of family

<i>Religion</i>	<i>Men n (%)</i>	<i>Women n (%)</i>	<i>Total N (%)</i>
Sikh	72 (45.0)	81 (46.6)	153 (43.7)
Hindu	68 (42.5)	70 (36.8)	138 (39.4)
Jain	12 (7.5)	22 (11.6)	34 (9.7)
Christian	8 (5.0)	17 (8.9)	25 (7.1)
Total	100.0 (160)	100.0 (190)	100.0 (350)
Type of family			
Nuclear	65 (40.6)	79 (41.6)	144 (41.1)
Extended	77 (48.1)	103 (54.2)	180 (51.4)
Lived alone	18 (11.2)	8 (4.2)	26 (7.4)
Total	160 (100.0)	190 (100.0)	350 (100.0)

Majority of the inmates belong to Sikh religion, followed by Hindu and a few belonging to Jainism and Christianity. It is found that more than half of the elderly (51%) in the present study had lived in extended family, while about 41 per cent had lived in nuclear family, and 7 per cent had lived alone, before coming to the old age home.

Table 5
Financial status of elderly inmates of old age homes

	<i>Men n (%)</i>	<i>Women n (%)</i>	<i>Total N (%)</i>
Elderly receiving financial assistance from some source	73 (45.7)	78 (41.1)	151 (43.1)
Elderly having no financial assistance	46 (28.7)	99 (52.1)	145 (41.4)
Financially Self Sufficient	41 (25.6)	13 (6.8)	54 (15.5)
Total	160 (100.0)	190 (100.0)	350 (100.0)

As can be observed from table 5, a majority (43.1%) of the elderly admitted financial assistance from some source. On the other hand

41.4 per cent of the elderly were not getting any financial aid and only 15.5 per cent of the elderly reported self-sufficiency. More men (25.6%) were self-sufficient as compared to women (6.8%).

Table 6
Sources of monetary assistance among the elderly

<i>Source</i>	<i>Men n (%)</i>	<i>Women n (%)</i>	<i>Total N (%)</i>
1. Spouse	—	17 (21.8)	17 (11.2)
2. Charity/State or NGOs	26 (35.6)	36 (46.2)	62 (41.1)
3. Children	6 (8.2)	10 (12.8)	16 (10.6)
4. Brother/Sister/Relative/Friend	41 (56.2)	15 (19.2)	56 (37.1)
Total	73 (100.0)*	78 (100.0)*	151 (100.0)*

* Only those elderly included who were getting financial assistance from some source.

Furthermore from the Table 6, it can be seen that among those elderly who were getting financial assistance, a majority (41.1%) of the elderly were getting financial assistance from state or private organizations, followed by those (37.1%) who receive financial assistance from brother/sister/other relative/friend. More men elderly (56.2%) were receiving monetary assistance from their relatives or friends as compared to women elderly (19.2%) which possibly explains the better social relations maintained by the male elderly throughout life. Only 10.6 per cent were those who were getting financial help from their children.

Table 7
Showing the percentage of elderly who were self-sufficient

<i>Self-sufficient</i>	<i>Men N (%)</i>	<i>Women N (%)</i>	<i>Total N (%)</i>
Pension	22 (53.6)	3 (23.1)	25 (46.3)
Property Rent	8 (19.5)	4 (30.8)	12 (22.2)
FDs, Savings in bank	11 (26.8)	6 (46.1)	17 (31.5)
Total	41 (100.0*)	13 (100.0*)	54 (100.0*)

* Only those elderly are included who disclosed self-sufficiency regarding financial status.

Among the elderly who admitted self-sufficiency, as can be observed from the Table 7, a majority (46.3%) of the elderly were drawing pension. The next higher percentage of elderly (31.5%) were those having fixed deposits or savings in the bank, while for 22.2 per cent elderly had property rent as their financial resource.

The elderly who were getting financial assistance from someone were more satisfied in life as compared to elderly who were not getting any financial assistance. The majority of the elderly had financial problems. Feelings of the elderly regarding financial assistance/problems faced by them may be understood from the following case studies.

Case Study No. 1

An elderly woman, aged 67 years, shared that she was getting financial assistance from her children. She had two sons both were assisting her financially while living in old age home. She told that living in old age home is a curse itself but when you get some kind of financial assistance from someone it is almost like blessings in disguise. She feels much better as compared to other inmates who were not getting any financial assistance. She told that living in old age home your basic needs (food, shelter and clothing) are taken care of but still you need some money for daily requirements and these requirements may be such as: recharging of the mobile phone (which is most essential for remaining in touch with your loved ones), medicines (medical needs) and buying eatables for personal use, etc.

Case Study No. 2

Another elderly woman, aged 69 years, living in old age home in Chandigarh shared that financial security or assistance from someone is very important in old age. She is a widow and has two daughters and one son and all are married. Her husband was a class four servant and whatever money he had, was spent in purchasing a house and on the marriages of the children. She was dependent upon her husband for all her economic needs. After the death of her husband, the son took the right over the property and forced her mother to live in old age home. Since her daughters are not so financially sound they can neither accommodate her nor provide any financial assistance to her. She has to fully depend upon the services provided by the old age home. She sometimes feels wretched as she does not get any financial assistance from anyone to cope with emergency situations. She told that sometimes she has to beg for money from other inmates so that she can go outside the home for

her medical checkup during ill health. Since the doctor visits old age home only once in a month and that too not regularly. She stated that the inmates usually visit a dispensary which is located in a *Gurudwara* nearby old age home where the cost of medical checkup is Rupees 10. But irony is that she sometimes doesn't have this much money and has to borrow or even beg for money. She opined that one should save money for later stages of life so as to cope with any adverse situations.

Case Study No. 3

An elderly male widower, aged 67 years, living in an old age home in Ludhiana shared the importance of financial independency at the later stages of life. He retired as school teacher and was getting pension which was the only source of income for him. Whatever money he had saved was spent on purchasing a house for his family. After the death of his wife his only son, who is married, took over the property and shifted him to old age home. He shared that the old age home in which he was living previously was not very well maintained and he was not satisfied with the services provided by the old age home. So he decided to move to another old age home where he could get better services like single room for living, suitable food during ill health, etc. Finally he moved in to a paid old age home which provide better services and facilities. He stated that only due to financial sufficiency, he was able to move or change old age home, while many other inmates of old age homes, due to lack of financial sufficiency, could not afford to do so,.

The elderly who were self-sufficient rated higher in life satisfaction. They expressed their option that they want to shift to old age homes with better facilities (or even to the 'paid' ones). On the contrary the elderly having no financial sufficiency/assistance could not do much and have to accept things as such.

Discussion

Longevity in India has increased over the years and the number of elderly, 80 years and above, has also increased. These elderly (80+) require more intensive and long term care, which ultimately leads to more financial stress on the family or on elderly person. The

socio-economic problems of the elderly are intensified by the factors such as absence of adequate income, change in social role and lack of social security.

Among the elderly the most helpless are those who do not own productive assets, have no pension and are not taken care of by their children, or those who live in families having low income with large number of dependents. Kumar (1996) in a study pointed out that nearly 85 per cent of the aged have low economic resources and less accumulated savings. As a result of which majority of them were not in the good position to sustain even minimum standards of food, clothing and shelter. He further found that 68 per cent of the elderly were still working to meet their monetary needs.

It was observed in the present study that only 15 per cent of the elderly inmates were financially independent, 43 per cent received financial assistance either from spouse, children relative or from charity and NGOs. The condition of those elderly who were not having any financial assistance (about 41%) was worse as compared to elderly who were financially independent or were getting financial assistance from other sources. While living in old age home the elderly are provided with basic needs (food, shelter and clothing) but still they need money for other essential daily needs. In the present sample, more women than men were dependent on others throughout their lives, because of lower literacy and higher incidence of widowhood.

It is intimidating to note that only 10.6 per cent elderly were getting financial help from their children. It was further observed in the present study that more male elderly received monetary assistance from their relatives or friends as compared to female elderly. It explains that relatively better social relations were maintained by the men throughout their lives.

Ramamurti (1970) has reported that socioeconomic status is a significant factor which determines satisfaction and dissatisfaction among the aged. Bromley (1974) found that poverty, loneliness and under nourishment contribute to the general burden of ill health and reduce the likelihood of longevity. More men (about 41%) in the present sample were self-sufficient while living in old age home as compared to women (13%). Therefore, more male elderly were found to have higher economic satisfaction.

Most financially self-sufficient elderly were found living in private or paid old age homes which provided them better services and facilities. On the contrary the elderly having no financial sufficiency/assistance live in old age homes that are free or do not charge money for living.

Living arrangement and care of the elderly is emerging as one of the major issues concerning the elderly. In future more and more elderly will have to live in old age homes in India in the context of emerging small family norm, strained relations among family members, and occupational mobility of children.

The magnitude of the problem of ageing has of course not reached the extent it has in the west, but it is likely to attain the same level soon due to rapid transformation of the Indian society. To avert the far reaching consequences, measures for the rehabilitation of the aged in the changing conditions have to be worked out now.

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The Functioning of Kerala's Maintenance Tribunals for Senior Citizens: A Study

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ABSTRACT

Government of India, in the year 2007 adopted the Maintenance and Welfare of Parents and Senior Citizens Act. This act entitles the state governments to set up tribunals i.e.; Maintenance and Appellate Tribunal in every district. The state government of Kerala constituted the Kerala Maintenance and Welfare of Parents Senior Citizens rule in 2009, in order to implement the provisions of the act. In this paper an attempt was made to analyse the role of maintenance tribunals in preventing the elder abuse in Kerala. For this purpose six tribunals were selected by purposive sampling method, to understand the functioning and the problems faced in the functioning of maintenance tribunals. To find out the problems faced by the elderly petitioners, 60 petitioners (10 petitioners from each tribunal) were selected randomly. These elderly respondents (N=60) were interviewed individually to find out their experiences regarding the functioning of the tribunals and the difficulties faced by them in getting the solutions of their problems.

Key words: Elder abuse, Maintenance act 2007, Maintenance Tribunal

Kerala is greying faster than any other states in the country, with a life expectancy of more than 71 years. Fertility rate of Kerala is 1.6, which means the older age group is expanding and the younger age group is shrinking, says a study conducted by S. Irudaya Rajan and U S

Mishra of Centre for Development Studies (CDS) Thiruvananthapuram (Irudaya Rajan, s and U S Mishra, 1997). Kerala's total population as per the 2011 census is 3.36 crore, of which 12.6 per cent are aged above 60 years. The emergence of globalization and the related changes in our society should have its reflection in the living conditions and status of the elderly. Urbanization and modern working conditions disintegrated the traditional joint family system into nuclear families. Emergence of new family system brought changes in the values of individuals, making them more and more individual centric. Mutual communication, togetherness, sharing and caring, etc. which were the characteristics of the early family system is fast disappearing today. Earlier elders were respected and were the centres of decision makings in the family and elders were the head of the family, and parents taught their children to respect the elder members. Once they adorned our verandas, and every one showed love and respect towards them. In many houses their words were final in decision making regarding family matters. Now they are pushed to the back rooms of the houses. As their age advances, this gives them a feeling of insecurity, isolation and unwantedness. They become physically, economically and emotionally more dependent on their children.

The increasing dependency over the children results in the elder abuse. According to WHO elder abuse is defined as “ a single, or repeated act, or lack of appropriate action, occurring within any relationship where there is an expectation of trust which causes harm or distress to an older person” (http://www.who.int/ageing/projects/elder_abuse/en/). More over the old age people are experiencing emotional, physical and financial abuse and neglect from their family members. There are a number of factors which stand as the background of the introduction of Maintenance and welfare of parents and senior citizens Act 2007. This act is an answer to the insecurities faced by the older persons of our country. In order to implement the provisions of the Act, the state government of Kerala has constituted the Kerala Maintenance and Welfare of Parents Senior Citizens rule in 2009.

Maintenance and Welfare of Parents and Senior Citizens Act 2007

At the same time The Maintenance and Welfare of Parents and Senior Citizens Act provide simple, inexpensive and speedy provisions to claim maintenance for parents. The bill proposes to cast an obligation on the persons who inherit the property of their aged relatives to maintain them and there is a provision for setting up old age homes for providing maintenance to the indigent older persons. Under the Act parents can demand maintenance from children. The maximum maintenance allowance which may be ordered by such tribunal and prescribed by the state government shall not exceed Ten thousand rupees per month. The bill proposes to provide better medical facilities to senior citizens, which include in every government and government funded hospitals. It includes provisions of beds for senior citizens, a separate queue for older persons and all facilities for the treatment of chronic diseases among older persons. This Act constituted two tribunals-Appellate Tribunal and legal Maintenance Tribunal. In Kerala there are 21 maintenance tribunals and 14 appellate tribunals (Annual progress Report, 2014). Under the Act people above 60 years of age can file complaints. Parents and grandparents can file case against children and grandchildren under section 5 and the childless senior citizens can file case against the legal heir under clause (g) of section 2 of the Act for protection and maintenance. If a senior citizen is incapable, then the tribunal can take case on *suo-motu* base under section 4. If a complaint is found acceptable, then the accused are compelled to give maintenance not to exceed rupees ten thousand per month. (<http://socialjustice.nic.in/writereaddata/UploadFile/Annxure-X635996104030434742.pdf>).

A survey conducted by Help. Age India in 2014 states that the awareness of the Act is very low among the elderly in India. One in every five elderly is unaware of the redress mechanism. According to the survey only 14 per cent of the victims of abuse know about the existence of law. The first case under the Maintenance Act reported in India was in 2011 at Tuticorin by Siluvai (84 years) and his wife Arulammal (80years). They filed case against their only son and daughter-in-law for neglecting them after taking away their property. The number of cases registered in Kerala is increasing day by day.

According to the Annual Progress Report of Social Justice Department, the total number of cases registered in 2014 were 2587 and in the year 2015 this number increased to 3096. This shows the increase in the rate of abuse faced by elderly from their family members. The following table shows the total number of cases registered in Kerala during 2014 and 2015.

<i>District</i>	<i>Total applications for the year 2014</i>	<i>Total applications for the year 2015</i>
Thiruvananthapuram	527	553
Kollam	228	281
Pathanamthitta	200	221
Alappuzha	307	182
Kottayam	120	126
Idukki	106	56
Ernakulam	374	842
Thrissur	166	66
Palakkad	164	260
Malappuram	97	81
Kozhikode	23	72
Kannur	166	245
Wayanad	64	91
Kasargode	45	20
Total	2587	3096

Source: Annual Progress Report, Social Justice Department on the reported cases in 2014 and 2015 under the Maintenance and Welfare of Parents and Senior Citizens Act 2007.

The above table shows a rapid increase in the number of applications during the year 2015 when compared to the previous year. It can also be seen that Thiruvananthapuram, Ernakulam, Palakkad and Kannur have the highest number of reported cases.

Objectives of the Study

- To understand the functioning of Maintenance Tribunal.
- To assess the problems faced in the functioning of Maintenance Tribunal.
- To find out the problems faced by the elderly petitioners.

Methodology

For the present study six Maintenance Tribunals (only one from each district)-Thiruvananthapuram, Patanamthitta, Ernakulum and Kannur. Thiruvananthapuram and Kannur were selected by purposive sampling method. These tribunals were selected as samples because as per the statistics from Social Justice Department most number of cases were reported in these tribunals during the year 2015. For getting data detailed interviews were conducted among the presiding officers, division clerks and other staff of maintenance tribunals. 60 elderly people (10 elderly people from each tribunal), who filed case in the tribunal, were selected from the case lists of the tribunals. These 60 elderly persons were also interviewed for getting their personal experience while filing application in the Maintenance Tribunal.

Functioning of Tribunals

As per the Act, the tribunal should have a panel of conciliation officer under sub-section (6) of section 6, which includes Maintenance Officers designated under section 18. In the present study in all the six tribunals Revenue divisional officer acts as the presiding officer. Revenue Divisional Offices acts as the special court for handling cases under Senior Citizens Act. In all the six RDO there is a panel of conciliation officers. This panel includes advocates and social workers denoted by the senior citizens forum. There is a division clerk who handled the case files. The proceeding of the tribunal was held in the chamber of presiding officer. The hearing in the tribunal was handled by the Revenue Divisional Officer, Senior Superintendent and a section clerk.

Under the act, the application for maintenance under section 4 should be made in a Form as in the manner laid down in clauses (a) and (b) of sub-section 1 of section 5. As per the Act the presiding officer has the duty to enter the details of application in a Register of Maintenance Claim cases as directed by the State Government and they should send intimation about the receiving of application to the applicant. In the present study it is clear that the selected tribunals were accepting only the completed form with all the details of the applicant and respondent. After getting an application; the section clerk made a

detailed study about the case and sent notice of intimation for the petitioner and respondent with the consent of presiding officer. Here petitioner was the senior citizen and the respondent was the children or legal heir. In the study it is clear that after getting a complaint all the selected tribunals conducted a preliminary enquiry about the petitioner and opposite party. Enquiry was conducted with the help of village officer and the concerned police station about the living condition of the applicant and the family condition, income and occupation of the opposite party. After making verification the tribunal proceed with the case.

As per the Act there is a provision that if the opposite party is ready to take the liability and provide maintenance to the elderly then there is a chance for out court settlement and the tribunal pass an order accordingly. In this study the section clerk of Thiruvananthapuram RDO said that in some cases both parties were ready for out of the court settlement. In her words *"some of the parents file petition against only one son or daughter, who is currently looking after the parent because of the pressure from the side of other children for getting property"*. From this it is clear that some people are misusing the Act. If both parties are not ready for a settlement, then the tribunal refers the case to conciliation. As per the Act after getting a reference under rule 10, the conciliation officer should hold meetings with two parties and try to make a mutually acceptable settlement within one month from the date of receipt of the reference. In this study the section clerks of all the six tribunals said that the conciliation is possible only in a small number of cases. If the conciliation officer is unable to arrive at a settlement he should return the papers received from the tribunal along with a report. After this, the tribunal conducts a hearing for both the parties for advancing evidence in support of their respective claims.

A detailed hearing was conducted in all the RDO. Every week, one day is fixed for the hearing of cases under the Senior Citizens Act. The study also revealed that a specific date and time is fixed for hearing. In Thiruvananthapuram hearing was conducted on every Saturdays, in Thalasseri, Fort Cochi and Muvattupuzha it was every Thursday. As in the case of Adoor and Thiruvalla, they conduct hearing on every Wednesday.

Findings and Discussion

It was noticed that the number of cases handled by maintenance tribunals in a single day and the time of hearing varied significantly. It was found that most of the maintenance tribunals cover less than ten cases in a single sitting. In Thiruvananthapuram 9 to 14 cases were heard in a day. In the case of Pathanamthitta, Ernakulum and Kannur the hearings were conducted in the forenoon or in the afternoon on the fixed date. So they could cover only approximately 5 to 7 cases in a day. Because of the time constraint they could cover all the applications within one year. The tribunal defers the pending cases to the next year.

Problems Faced in the Functioning of Maintenance Tribunal

In the present study it was noticed that the revenue divisional offices had their own limitations for handling the cases under Maintenance Act. Because they have to manage other issues related to revenue. The Revenue Divisional Officer has multiple administrative responsibilities, which lead to the delay of proceedings in majority of tribunals. In the study it is clear that the immediate transfer of the RDO makes certain practical issues. Because the new RDO takes lots of time to study the new situation. One of the division clerk from Thalassery said that he “has lots of work related to revenue recovery, land issues, road issues etc. other than the maintenance cases”. He felt it as an extra burden. The inadequate number of staff was the major problem faced by the tribunal.

Table 1
Number of received and pending applications in the year 2015.

<i>S No.</i>	<i>District</i>	<i>Tribunal</i>	<i>No of applications received</i>	<i>No of applications pending</i>
1.	Thiruvananthapuram	Thiruvananthapuram	553	390
2.	Pathanamthitta	Adoor	72	55
		Thiruvalla	149	111
3.	Ernakulum	Fort Kochi	724	584
		Muvattupuzha	118	94
4.	Kannur	Thalassery	245	119
	Total		1,861	1,353

Source: Annual Progress Report, Social Justice Department on the reported cases in 2015 under the Maintenance and Welfare of Parents and Senior Citizens Act 2007.

The above table shows the fact that the maintenance tribunals got a large number of cases in a year but they were not being able to consider all the cases within one year. As the table shows, the total number of application received in the year 2015 was 1861; from which the tribunals could dispose only 508 cases and remaining 1353 were still pending.

The present study reveals that the number of applications received by the tribunal are increasing, but there is only a small number of staff for examining the application. Present study reveals the fact that the staff of the tribunal had only a limited time to cover a large number of cases. They can spend only 15 to 20 minutes for one case. There were no full time administrative staffs for senior citizens' cases. In all six tribunal, the division clerks said there is a need for full time administrative staff for handling the senior citizens problems. After issuing an order the tribunal seeks help of the police in checking if the order is properly followed or not. In the words of the tribunal staff the police department failed to assess if the order was followed correctly. In Fort Kochi and in Thalasseri the RDO were non malayalis, the applications were in Malayalam so they were not able to read it properly. In the case of non malayali RDO, the section clerk and senior superintendent have to take more concentration on the senior citizens case, because of the language constraints of RDO.

Problems Faced by the Elderly Petitioners

The elderly petitioners face number of problems while filing application under the Senior Citizens Act 2007. The most important problem is the age related problem.

Table 2
Age of Elderly

<i>Age of elderly</i>	<i>Frequency</i>	<i>Percentage</i>
60-69	20	33.3
70-79	20	33.3
80-89	17	28.3
90 and above	3	5.0
Total	60	100

Above table shows that majority of the elderly who filed petition against children belonged to the age group of 60–79 which constituted 66.6 percentage of the total sample. As age increases they face multiple health problems. Most of them face difficulty in attending hearings organised by RDOs for more than one time. Only in Pathanamthitta and Thalassery the hearing was conducted in the ground floor of the office. So the elderly can reach there easily. In other tribunals hearing is conducted in the first floor of the office and it makes difficulty for the elderly to climb the steps due to age related problems.

By interviewing the senior citizens who filed case, it was found that 52 per cent of them came to know about the act through their ward members, councillors and social workers. Only 10 per cent of the elderly had prior knowledge about the act.

Table 3
Benefits received by filing petition

<i>Benefits</i>	<i>Frequency</i>	<i>Percentage</i>
Gets maintenance and protection from children	35	58.33
Cancelled the deed	22	36.66
Gets maintenance from children and protection through government old age homes	3	5.0
Total	60	100

The above table shows that majority (58.33%) of the elderly received maintenance and protection from their children through Maintenance Act. A large section (36.66%) was able to cancel the deed of their property after getting neglected by their children. Only 5 per cent of the elderly got maintenance from their children and protection in government old age homes since they were not ready to live in their children's home.

Filling the application form is another difficulty faced by the elderly, even though the application form is in Malayalam the elderly do not know how to fill the application. So the information provided in the applications was insufficient. Because of their unawareness they are facing difficulty in filling the application properly.

Table 4
Nature of filling application

<i>Nature of filling application</i>	<i>Frequency</i>	<i>Per cent</i>
Elderly alone	14	23.33
Seeking help from others	38	63.33
Filled by advocates	8	13.33
Total	60	100

For giving an application under the Senior citizens Act the elderly has to fill a detailed application form. The above table shows that majority (63.33%) of the elderly sought help from others for filling application. This shows the unawareness of the elderly. In some cases the advocates were helping them to fill the application. 23.33 per cent of the elderly were filling the application by their own. The above table shows the fact that majority of the elderly were not aware about how to fill the application form.

Some of the elderly said that they face difficulty in communicating with non malayali presiding officers at the time of hearing. In some cases the children will stop paying maintenance amount after some months of the implementation of order. In such cases the parents had to approach again the tribunal and the tribunal gave warning to the children. If the children failed to obey the warning, the tribunal will issue a warrant against children.

Table 5
Level of satisfaction of elderly about the Act

<i>Level of satisfaction</i>	<i>frequency</i>	<i>Percentage</i>
To a great extend	29	48.33
To some extend	24	40.00
Not at all	7	11.67
Total	60	100

The above table deals with the level of satisfaction of elderly about the Maintenance Act. 48.33 per cent of the elderly were satisfied to a great extend which constitute majority of the respondents. 40 per cent of the elderly were satisfied to some extend and only 11.67 per cent were not satisfied with the Maintenance Act. The table shows the

fact that majority of the respondents were satisfied with the procedures of the Maintenance Act.

Conclusion and Suggestions

From the study it is clear that all the selected maintenance tribunal were keeping a detailed case report of each case with the order issued by the RDO. The present study reveals the fact that the inadequate number of staff is the major problem faced by the tribunal. Government should ensure a good monitoring system for the execution of order of maintenance tribunal. Most of the stake holders are satisfied with the functioning of the tribunal. The elderly who filed petition under the Senior Citizen's Act faced some problems. As age increases the health conditions of the elderly is deteriorating. Because of the health problems the elderly were not able to attend continuously in the hearing. Most of the Revenue Divisional Offices were functioning upstairs so it causes difficulty for elderly to climb up. Sometimes the children were not following the order of the tribunal and the elderly decided to file petition again in the Tribunal. In order to avoid such problems the government should take immediate action for monitoring if the order is being followed by the children through seeking the help of police department. Awareness about the Act among senior citizens is very low. The government should take initiatives for providing awareness among the senior citizens about the Act from the local level itself.

The government should appoint a full time administrative staff for handling the senior citizens' problems. It should ensure the help of a knowledgeable person for filling the application form for the elderly. The government should ensure that the tribunals were held in a place of convenience to elderly. There should be a committee for monitoring of the obedience of the order of RDOs. Property cases should be separated from maintenance Act in order to get effectiveness of the Act. There should be strict orders for appearance of both parties at the time of hearing otherwise the absence of any party leads to delay in the case. There should be a perfect documentation of each case. Finally the government should take initiatives for conducting outreach programmes among elderly in order to make them aware about the maintenance Act.

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Rising Demand for Community Based Long-term Care Services for Senior Citizens in India

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ABSTRACT

The aim of this paper was to understand and to find out the physical and emotional needs of senior citizens. Freedom and concept of nuclear family have resulted in the demand for formal care of elderly, which involves a strategic approach. India has a culture of home based care, but the changing family value system, economic pressures of the children, neglect and abuse have caused the elders to fall through the net of family care. Researches show that living arrangement has become an important constituent of well-being of elderly. Thus, there is a need for a model which would provide better care and take into account their well-being. Institutionalized care of older people is not popular in Indian society; one reason behind it is that culturally family is the prime institution to take care of older family members because of which older people have no mind set for old age homes as care giving institution in later life. Secondly, the population size of older people is so large that care homes cannot accommodate them well. Lack of proper infrastructure and skilled workforce in elderly care is another big reason for the low popularity of institutionalization. Above all is the social stigma attached with institutionalization despite the rising demand of community based care system. Older people feel

most satisfied and happy around the globe when they are in their homes with their family members. This paper is an attempt to highlight the need for long term care services as a support system for senior citizens in the community.

Key words: Health care, Long Term Care, Assisted care, Community based elderly care

Overview on Long Term Care

Ageing in humans refers to a multidimensional process of physical, psychological, and social change. Recent advances in health sciences and improving social conditions, it has become a duty for health professionals to make the later years of an individual more productive and enjoyable. Long term care means helping people with their medical and daily activity needs over the long period of time irrespective of their age. The majority of the users of such long term services and support are elderly citizens. The reason being cognitive decline which occurs due to the drop in regional brain volume, loss of myelin integrity, cortical thinning, impaired serotonin, acetylcholine, and dopamine receptor binding and signalling, accumulation of neurofibrillary tangles, and altered concentrations of various brain metabolites, and because of this decline elderly are not in the position to take a decision or form new memories easily. Secondly, at the age of 60 or 65 there is a drastic change in the mobility due to reduced dexterity which is most often found in the females because of the change in the endocrine system which reduces the production of calcium within the body, and this decline makes them dependent on institutional or residential care.

Health Care of the Elderly in India

A few important characteristics of the elderly population in India are noteworthy. Of the 7.5 per cent of the population who are elderly, two-thirds live in villages and nearly half are of poor socioeconomic status (SES) (Lena, *et al.*, 2009). Half of the Indian elderly are dependents, often due to widowhood, divorce, or separation, and a majority of the elderly are women (70%) (Rajan, 2001). Of the minority (2.4%) of the elderly living alone, more women (3.49%) than men (1.42%) (Rajan & Kumar, 2003). Thus, the majority of elderly reside in rural areas, belong to low SES, and are dependent upon their families.

The morbidity levels in the elderly are 2–3 times higher as compared to younger persons. The elderly face a dual burden of communicable and non-communicable diseases. Health care access is affected by a number of factors viz. Pathological progression of disease, mobility, dependency, nuclear families, employment, economy (earning potential, informality), population-wide inequities such as gender, caste, religion, state, etc. (Sharma, R., 2013; Sharma & Dey, 2015).

Where and by whom Long-Term Services and Supports are Provided

Long-term services and supports provide assistance for activities of daily living (such as eating, bathing, and dressing) and instrumental activities of daily living (such as preparing meals, managing medication, and housekeeping). These include institutions (such as nursing facilities and intermediate care facilities for individuals with mental disabilities), home and community-based settings (such as group homes or apartments).

- *Nursing Homes:* Institutional care like Nursing homes which includes nursing facilities and skilled nursing facilities, are the licensed professionals by the state to provide personal care. Individuals at advanced ages (85 and older) are much more likely to be institutionalized than are younger elderly people (ages 65 to 84) because frailty is more common at advanced ages and also because they are more likely to be widowed and thus not have someone who can care for them if they live in the community (Jamuna, 1995).
- *Other types of institutions:* all other facilities, primarily residential care facilities (RCFs) that provide institutional care but are not licensed as nursing homes. In general, an RCF is similar to a nursing home in that it provides assistance on a 24-hour-a-day basis, except that it is not licensed to provide skilled care. In addition to RCFs, this second category of residence includes other facilities that provide assistance for people with functional limitations, or supervision of medications, but not on a 24-hour-a-day basis.
- *Community-based residences that offer supportive services for elderly people:* According to data from the Medicare Current Beneficiary

Survey, or MCBS, the elderly nursing home population has declined over the past 10 years; because elderly people prefer living in residential care facilities like community-based housing. These residences offer them with meals, housekeeping, and laundry as well as some health-related services such as help with medications.

Affordability & Financial Assistance for Long Term Care of Elderly

In case of informal support i.e. when family members like wife, daughter or granddaughter are involved to provide service then the cost involved for welfare is time, efforts, forgone wages and other economic cost. And formal care is paid out of their own funds, through private insurance, or through public programs (such as Medicaid). US Congressional Budget Office have estimated 234 billion dollars of cost involvement for health care in the year 2011. This means the total amount generated for long term care via private insurance, Medicare and Medicaid is far much smaller than actually spent. Because these insurances pay only a small amount that too only when a licensed nursing home gives the permission. And depending upon their limitation which may be functional or cognitive, 80 per cent of the elderly over the age of 75 years have to stay in nursing homes. So, to meet the needs the other sources of payment are various federal and state programs for elderly people and private charitable donations in United States. In developing countries like India where taking care of one's parents, especially in their old age, is the matter of honour, but now with the westernisation of the traditional values where women are more enthusiastic to work in the workforce, there is rapid urbanization, Indian youngsters demand privacy and freedom of action i.e. any sort of interference from elders is not tolerated which have resulted in gap between the generations which further poses threats on their psychological wellbeing. (Sharma, R., 2013, 2016).

Strategies for Long Term Care of Elderly in India & Other Asian Countries

Government of India has guaranteed a social security support for the health care and welfare of elderly citizens under Article 41 of the Indian constitution. Though government have made promises to

improve healthcare facilities but social and economic conditions like poverty, breakup of joint families and poor services for elderly posed the threat of psychiatric disorder. According to Indian researcher prevalence rate of depression among the geriatric age group is 49 per cent (Sood, *et al.*, 2006). This prevalence rate have increase from 33 per cent (Nandi, *et al.*, 1975) to an alarming number which calls for a fruitful action plan, which make sure that older population is informed regarding the upcoming welfare facilities for elderly, like Government announced for National policy for older person in 1999 which encourages geriatric units in clinics and hospitals, emphasis on family care for aged person via incentives and schemes for needy family, etc.; and in December 2007, Indian Parliament passed a bill known as “Maintenance and welfare of parents and senior citizens act” (GOI, 2007).

Financial protection for health spending in India is largely in the form of savings and insurance. However, insurance in India is limited not only by its low coverage of conditions, but also by low coverage of populations. National Family Health Survey of 2005–2006 indicates that only 10 per cent of households in India had at least one member of the family covered by any form of health insurance (IIPS 2007). Overall, the insurance market in India remains limited and fragmented in its presence. Benefits are accessed by only a few privileged sections of the population, such as those in the formal and civil service sectors like defence services, civil services, and the railways, even after retirement long into old age (Acharya and Ranson, 2005; Ellis, *et al.*, 2000; Ranson, *et al.*, 2006). Lack of employment and income affect elderly utilization of medical insurance, as these populations are often incapable of paying regular insurance premiums. Finally, insurance companies often explicitly exclude the elderly due to age limits or eligibility restrictions for those with pre-existing conditions. This resulted in heightening the estrangement of the aged from a healthcare system and policy environment that has historically lagged behind in supporting the financially weak (World Bank, 2001) older people.

In recent times, the Indian government has occupied substantial progresses in the direction of acquiring the rights of the aged. Indian parliament in the year of 2007, passed a bill known as Maintenance and Welfare of Parents and Senior Citizens Act, which made upkeep of parents or senior citizens by families or relatives mandatory as well

as reasonable in addition to provided penal provision for their desertion. Subsequently the government framed the National Programme for the Health Care of Elderly in 2011 which was introduced to arrange for easy admittance to protective, promotive, restorative as well as rehabilitative amenities to the ageing at different stages of health care provision scheme along with focussed long-term as well as short-term training to those who are involved in this sector so that they can cater to the requirements of the aged. The National Policy on Senior Citizens in 2011 identifies senior citizens as a value deserve for the country and confirms their complete contribution in the social order. It purposes at providing socio-economic sustenance through income-generating undertakings, insurance, social security schemes, besides supporting care of senior citizens within the family.

Being dependent on others for their daily care like bathing, clothing, etc. makes them even more agitated and depressed because caregiver fails to meet the demand of the caretaker (Sharma, 2013). So keeping in mind the problem which elderly face on being dependent on other for their care, it's important to train them to be independent to experience the sense of accomplishment which further motivates them to maintain independence for longer period of time and secondly it's also important to train them on their mobility concern, every person's need is different, so professionals need to focus on the concerned problem and train them accordingly.

And in order to suffice the need of the older people it is also important for the government to not only adopt the policies but also to work on those policies effectively by providing certified training to the professionals who will be helping older people, training them holistically which includes their nutrition, medication, physical needs as well as psychological needs, and above all training their family members to deal with their issues.

As we are aware that India has a culture of home based care where it has been taken for granted that family is supposed to be the prime institution to take care of its elderly. Nevertheless, changing family value system, economic pressures of the children, neglect and abuse, etc. have caused elders to fall through the net of family care. Researches show that living arrangement has become an important constituent of well-being of an elderly. Ramachandran, *et al.*, (1981) described that family and living conditions are substantial factors

affecting the mental health of the elderly. Recent researches have reported that in the states of India proportion of elderly living alone are increasing substantially (Palloni, 2001).

The recent trend of elder abuse in India shows that older people are not safe with their family as in most of the cases they are being abused by the son or daughter-in-law (Sharma & Kaur, 2016). Studies on elderly abuse relate it to caregiver stress as it is found that depression and anxiety appear to be significant problems for all caregivers (Tennstedt, 1999). This inattention to the needs of caregivers who are at risk of becoming abusive points to the need for better coordination between agencies that provide protective services to victims and those that offer services to reduce caregiver stress. The evidence shown by newspapers shows that those living alone are also not secure (Times of India, June 14, 2014 & 2016). They are frequently being robbed and killed by their relatives, house helps hired from agencies, and by professional robbers. In Indian context majority of elderly population which is characterized as feminine, dependent, less educated and of low or middle socio economic status cannot afford to pay high bills to institutionalized set up. Therefore, it the responsibility of the nation to take care of its elderly population who contributed in the development of the nation when young and who are now waiting for the helping hand from their country.

That is why the focus of this research is to prepare a best Portal to In-Home Care and Community Based Services in India. Increasingly in modern societies, elderly care is now being provided by state or charitable institutions. The concept of long term care which is very popular and successful in western countries is now entering into the sphere of Asian countries. By following the footsteps of Washington healthcare training programs, we will be able to resolve issues of many of our senior citizens, maybe we will be in the position to resolve the issues more effectively, and provide them with a healthy care at home as well. An increase in the older population will lead to an urgent need for elder care and support, at a time, in India particularly where traditional family-based care is becoming less the norm than in the past (Arokiasamy, *et al.*, 2012). With weak public pension and social security systems coupled with changing household structures,

planning for the elderly especially in terms of living arrangements is critical.

Conclusion

Thus, it can be stated that by means of a resilient system of public health structure in place, emphasis ought to be on building human resource capability by providing a specified education and training prospects. It has been observed that some of the regions which need to be studied in the field of aging in the Indian context comprises of etio-pathological devices of ageing, socio-economic sustenance for ageing, strategies to stimulate healthy and active ageing development, effective models of geriatric health care distribution, exploration in unconventional medicine as well as the study of age-related disorders., One should be focusing on cost-effective, realistic models of elderly care that is adequate and grounded on our cultural practices and traditions. There is an immediate need to look for new models of economic support and insurance. Even though health insurance sector is on a rise in India, the insurance policies incline to omit those who need it, particularly the old. A widespread precautionary package should be brought, comprising information and cognizance regarding shared geriatric glitches and their prevention, focusing on nutrition, physical workout, yoga in addition to meditation, and providing psychological well-being.

It's well stated that no rules/policies can teach an individual about respecting and caring for the aged. As a result, parents have a most important role to play toward promotion of respect for elders at a tender age. The government should focus on raising the capacity of health professionals in geriatric care through specialized courses and trainings and develop socio-economic support mechanisms for the elderly in the community.

Thus, it may be said that with the increase in chronological age bodily demands also change which needs to be addressed informally or formally. Informal care is given by family members whereas formal care is given by licensed professionals which involves cost, so one needs to maintain the financial independence.

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