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Impact of Optimism, Resilience, and Gratitude in Coping and Health among Older People

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ABSTRACT

The present study investigated the relationship between optimism, resilience, and gratitude in coping and health among 151 older people (61 Females, and 90 Males, Age Mean: 68.4 y; SD: 7.44 y) who were selected by purposive sampling method, during covid-19. Optimism Measure, Brief Resilience Scale, Gratitude Questionnaire, Coping Scale, and Physical Health Questionnaire were administered to find out the responses of the subjects individually. A strong relationship between optimism and resilience in health and coping was found in this study. Gratitude showed up significantly only in one relationship: health for males, not females. On the basis of the present findings, it may be concluded that optimistic and resilient personality traits in older people may have better coping and health status during the pandemic covid-19.

Keywords: Optimism, Resilience, Gratitude, Coping, Health, Older people.

Geriatric mental health is one of the most significant public health concerns during the Covid-19 crisis. The older generation is at a higher risk as the fatality rate may reach 20% among persons over 80 years of age (Jordan, *et al.,* 2020; Logar, 2020). The COVID-19 pandemic has created stress and fear that affect the resilience of older people.

Resilience substantially impacted physical, cognitive, and mental recovery during the COVID-19 pandemic for all age groups; it was worse among older adults with chronic conditions or functional limitations (Lee, *et al.,* 2020). For example, a nationwide mental health survey in China during the Covid-19 pandemic revealed that one-third of those above 60 years suffered from anxiety, depression, grief, and insomnia (Qiu, *et al.,* 2020).

The above review indicates that more research is needed to fill the gap, especially about optimism, resilience, and gratitude concerning coping and health.

Optimism, Resilience, and Gratitude about Coping

Optimistic individuals are generally more active "copers" than pessimists (Taylor, and Aspinwall, 1996). Scheier, *et al.,* (1986) found a significant positive association between optimism and coping strategies and emphasized that optimism amplifies the positive aspects of stressful situations. Past studies have confirmed that optimism affects problem-solving coping strategies more than pessimism (Wrosch, and Scheier, 2003; Rasmussen, *et al.,* 2006).

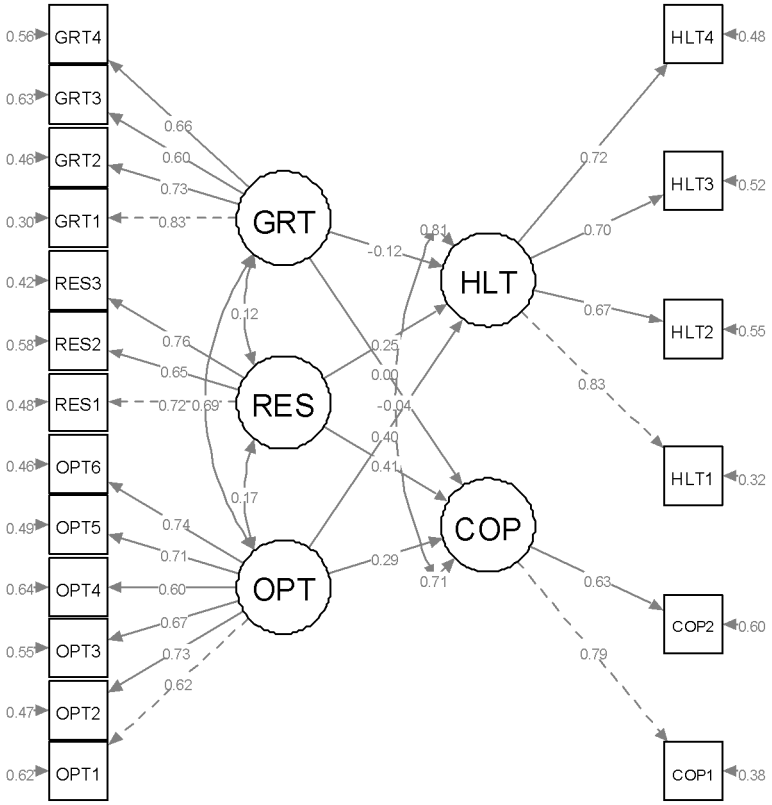
Resilience would empower older people to adjust their individual needs, accomplish adaptive tasks, and develop the cognitive and behavioral skills necessary for survival in the face of aging-related stressors (Ryff, *et al.,* 2012).

Wood, *et al.,* 2007; Wood, *et al.,* 2010 found a significant relationship between coping styles and gratitude Furthermore, they suggested a positive (negative) association between gratitude and positive (negative) coping styles.

The primary object of the present study was to investigate the relationship between optimism, resilience, and gratitude in coping and health among older people. On the basis of the above discussion it may be hypothesized: H1: Optimism, resilience, and gratitude are related to coping, and H2: Optimism, resilience, and gratitude are related to health.

Figure 1

The Overall Model of the Study Variables



Note. Source: Authors' own based on the *lavaan* output of data analysis.

Material & Methods

Sample

One hundred fifty-one senior citizens (61 females, and 90 Males Age-Mean: 68.4 y; sd: 7.44 y) were selected using purposive sampling

method from 16 cities in Uttar Pradesh. They were administered questionnaire to find out demographic information such as socioeconomic status, education, occupation, and monthly family income.

Tools used

Five scales were adapted to measure the variables. The State Optimism Measure (SOM; Millstein, *et al.,* 2019). It is a *seven*-item scale; coefficient alpha = .92 ~ .96) was selected to accommodate respondents' state of optimism at the time of the prevalent COVID-19 situation. Hamby "anchors people in the present moment in different ways" (Ibid, p. 85). The items conform to the accepted definition of optimism as "positive expectations about the future." To measure resilience, the Brief Resilience Scale (BRS; Smith, *et al.,* 2008; *six* items; Cronbach alpha = .80 ~.91) was selected, which measures the "ability to bounce back from difficult situations." Measurement of gratitude adapted the Gratitude Questionnaire (GQ6, McCullough, *et al.,* 2002; *six* items; coefficient alpha = .82 ~ .87), which measures "proneness to gratitude in daily life." Measurement of coping employed the Coping Scale (CS, Hamby, *et al.,* 2013; 14 items; coefficient alpha = 0.88 ~ 0.91), which assesses "cognitive, emotional, and behavioral methods of dealing with people." The Physical Health Questionnaire (PHQ, Schat, *et al.,* 2005) measures somatic health symptoms. PHQ comprises four subscales with respective reliabilities (Cronbach alpha) as below: Gastrointestinal Problems subscale (.84 ~ 0.86); Headache's subscale (.90); Sleep Disturbance subscale (.81); and Respiratory Illness subscale (70 ~ .77).

The present study developed a 41-item bilingual (English + Hindi) questionnaire (CHOP: Coping and Health Among Older People During COVID-19), which adapted all items from SOM, BRS, and GQ, but only 11 items each from CS and PHQ scales. The items required a response on a five-point Likert-type scale (1: "strongly disagree"; 5: "strongly agree"). In addition, CHOP sought informed consent to participate in the study and the personal and sociodemographic information of the participants.

The present study adopted a questionnaire-based survey design. Data analysis involved robust confirmatory factor analysis (rCFA) in identifying three exogenous constructs (optimism, resilience, and gratitude; employed as independent variables) and two endogenous constructs (coping and health; employed as dependent variables). In addition, robust multivariate multiple regression analysis (rMMRA) tested the structural relationships among the independent and the dependent variables. Statistical analyses employed R-software (R Core Team, 2020) with the following specific packages: car (Fox & Weisberg, 2019), CTV (Zeileis, 2005), GPArotation (Bernaards & Jennrich, 2005), lavaan (Rosseel, 2012), lm.beta (Behrendt, 2014), MASS (Venables & Ripley, 2002), MVN (Korkmaz, *et al.*, 2014), psych (Revelle,, 2020), and semPlot (Epskamp, 2019).

The Measurement Scale

Refinement of the Measurement Scale: Procedural Strategies

Multiple remedies to address various concerns regarding common method variance (CMV) were adopted (Podsakoff, *et al.*, 2003; Chang, *et al.*, 2010; Williams, *et al.*, 2010; Podsakoff, *et al.*, 2012): (i) Procedural strategies employed data collection using different sources (online and offline) and counterbalancing of items; and (ii) a statistical strategy described in the section dealing with the analysis and results below.

Procedure

The questionnaire was administered through two modes: online and offline. First, an email with the questionnaire attached was sent to the participants. Since the data collection happened during the COVID-19 pandemic, personal visits to the participants or personal meetings were avoided to honor the social distancing advisory in vogue. Therefore, offline data collection used the questionnaire as a schedule completed by two authors of this work through telephonic interviews with the participants. Second, the online survey collected data through Google Forms, automatically arranging the responses into Excel sheets.

Results

An Overview of Data Analysis

Responses (151; offline: 101, online: 50) were pooled after reverse scoring wherever required. There was only one missing observation, which was replaced by the mean for that particular variable. Data analysis involved: (i) Statistical test for the common method variance; (ii) Confirmatory factor analysis; (iii) Hypothesis testing with latent variables; and (iv) multi-group comparisons in assessing the influence of the sociodemographic characteristics. Huber-White's robust standard errors approach was employed to obtain robust parameter estimates (Wallace & Silver, 1988, quoted as cited in Gujarati, *et al.,* 2009, p. 412).

Harman's single-factor test revealed an 18 percent variance with a single-factor principal-axis solution, providing statistical evidence for the absence of CMV. Procedural and statistical strategies for CMV indicated the appropriateness of the data for further analyses.

Confirmatory Factor Analysis (CFA): The Measurement Model

The robust single-factor model did not provide acceptable parameters (χ^2 = 1700.3, df = 779, p = .000; CFI = .433, TLI = .403, RMSEA = .098, SRMR = .120). After some revisions based on modification indices and construct loadings, a solution with five constructs (OPT, RES, GRT, COP, and HLT) provided acceptable parameters (χ^2 = 182.3, df = 142, p = .013; CFI = .945, TLI = .934, RMSEA = .049, SRMR = .074). Information loss based on the Akike (AIC) and sample-adjusted Bayesian (BIC) information criteria indicated that the likelihood of finding the one-factor solution was negligibly small compared to the five-factor model (one factor—AIC: 17678, BIC: 17666; five factors—AIC: 7417, BIC: 7410). The ratio χ^2/df (= 1.28) also indicates that the model with *five* constructs had a good fit for the data. Figure 1 presents the construct loadings. Based on the distribution of the indicators into constructs, scales showed acceptable reliabilities (Cronbach alpha, α) – Optimism: .84; Resilience: .75; Gratitude: .80; Coping: .67; and Health: .82. Table 1

summarizes inter-construct correlations, square root of average variances extracted (AVE), and composite reliabilities (CR) of the constructs.

Table 1

Inter-Construct Correlations

Latent Construct	1	2	3	4	5
Optimism	1.00				
Resilience	.17	1.00			
Gratitude	.69	.12	1.00		
Coping	.36	.46	.25	1.00	
Health	.36	.30	.19	.20	1.00
SR-AVE	0.68	0.62	0.71	0.71	0.73
CR	0.84	0.75	0.80	0.67	0.82

Source : Authors' own; SD: Standard Deviation; SR-AVE: Square root of Average Variance Extracted; CR: Composite Reliability; AVE = $(\Sigma\lambda_j^2)$ /$[(\Sigma\lambda_j)^2 + (\Sigma\varepsilon_j)]$, CR = $(\Sigma\lambda_j)^2/[(\Sigma\lambda_j)^2+(\Sigma\varepsilon_j)]$, where $\varepsilon_j = 1 - \lambda_j^2$; λ_j: standardized loading of the j^{th} indicator.

Hypothesis Testing: The Structural Model

Figure 1 presents the sem model obtained as the *lavaan* output. It represents the measurement model with construct loadings and the structural model showing the regression parameters of the dependent variables (coping and health) on the independent variables (optimism, resilience, and gratitude). The structural model revealed the following: (i) a significant relationship of resilience with both coping (support for

H1 (b) and health (support for H2 (b); (ii) a significant relationship of optimism with health (support for H2 (a); and (iii) likelihood ($p = .051$) of a significant relationship between optimism and coping (support for H1 (a). On the other hand, gratitude had a non-significant relationship with both the dependent variables (no support for H1(c) and H2(c).

Three alternative analyses were performed to get converging evidence for the above findings: multivariate multiple regression analysis (MMRA), robust multiple regression analysis (MRA), and ordinary least square multiple regression analysis (MRA). The data for these analyses were the predicted scores of the latent variables obtained through CFA. Predicted latent variable scores have the advantage of being free from the contamination of the measurement error, which is a critical limitation of the regression models. Therefore, the regression errors can be considered as purely structural, free from measurement errors. The results of MMRA were the same as those obtained through MRA. The variance inflation factor values were much less than the criteria value of 5 (VIF- optimism: 2.56, resilience: 1.05, gratitude: 2.51) and thus indicated an absence of multicollinearity. Both rMRA and MRA provided converging evidence supporting all hypotheses except H2(c), which states a relationship between gratitude and health. Values of the F-statistic and the coefficient of determination (R^2) indicated that the model fit in each case was significant and strong. At a relative level, the model for coping was stronger than that for health.

Sociodemographic Influences

Multigroup MRA- based comparisons on sociodemographic characteristics (gender, type of family, age, and socioeconomic status) provided patterns of results similar to those obtained for the overall data. Groups for gender (Female, Male) and type of family (Joint, Nuclear) were forced on the observed values. Group identification for age (High, Low) and socioeconomic status (High, Low) was manipulated based on the median divide (High: above median; Low: median and below). Therefore, a manipulation check was carried out

for these characteristics before applying MRA. The t-test (unequal variance) indicated that the difference between the High- and the Low-groups' means for respective characteristics were significantly different. The values below indicate the median, N, mean, and SD for the High-group, followed by corresponding values for the Low-group: Age— 67y; High: 75, 74.1y, 6.64y; Low: 76; 62.8y, 1.74y; ($t = 14.2$, $df = 84.03$, $p < .001$); SES— 7.0; High: 70, 9.5, 1.20; Low: 81, 5.92, 1.03; ($t = 19.60$, $df = 137.2$, $p < .001$).

General Pattern of Relationships

Values of the F-statistic and adjusted R^2 (in the range of 0.215 to 0.556) indicated that most of the relationships varied from moderate to strong. Probabilities associated with the values of F-statistic indicated that all relationships were significant. Only one of the relationships (health for low SES) was weak (adjusted $R^2 = .166$). In general, optimism and resilience showed significant relationships with coping and health. Gratitude showed up as significant only in one relationship (health for males). Based on the relative values of standardized parameters (β), two interesting inferences were made: (i) The effect of optimism on health was almost twice as strong as that of resilience in all cases, except for females; and (ii) there was a mixed relative contribution of optimism and resilience to coping. The former was stronger than the latter for low socioeconomic status; weaker in sem, overall ols, females, nuclear family, higher age group, and higher socioeconomic status; and equal in the remaining cases.

Discussion

Comparatively lesser loss of information (AIC and BIC) and fewer indicators in the five-construct sem solution provide evidence for the parsimony of the tested model. Results of sem indicated that participants were able to discriminate between the constructs, and values of composite reliabilities (Table 1) support this inference. Loadings (Figure 1) indicate that the indicators had acceptable reliabilities and are valid for the identified constructs.

Literature suggests the following criteria for convergent and discriminant validities. Discriminant validity is indicated if each construct's square root of the average variance extracted (AVE) should be greater than the correlation between the constructs involved criterion for discriminant validity (Fornell & Larcker, 1981). Two recently suggested criteria that account for sampling errors (Cheung & Wang, 2017) are: (i) If the values of AVE *and* standardized indicator loadings are not significantly less than 0.5, convergent validity can be concluded. (ii) If the correlation between two constructs is not significantly greater than 0.5, discriminant validity can be concluded. Values of AVE, CE, and correlations in Table 1 meet these criteria. Thus, there was strong support for the five-factor model.

Figure 1 represents the research framework and summarizes the overall structural relationship between the constructs. A near-significant relationship between optimism and coping ($p = .05$) supported H1 (a) and is consistent with the existing research findings. Optimism is positively associated with emotion-focused and problem-focused coping, and pessimism is negatively related to emotion-focused and problem-focused coping (Anzaldi & Shifren, 2019). However, optimism is significantly associated with coping measures (Andersson, 1996), with a strong connection (Nes & Segerstrom, 2006). Resilience was significantly related to coping ($p = 0.001$). So, H1 (b) is accepted. Previous researches have proposed a link between resilience and coping (Lazarus & Folkman, 1984; Smith, *et al.,* 2016). Vannini, *et al.,* (2021) suggested that resilience is associated with coping during the COVID-19 pandemic. Coping strategies were associated with higher optimism and higher resilience was associated with mental well-being (Smida, *et al.,* 2021). During the epidemic, optimism encouraged proactive coping techniques and acceptance of challenges. Resilience and coping interact dynamically with each other (Craig, *et al.,* 2022). Thus, the present results support the earlier work on the relationship between resilience and coping.

Optimism was significantly related to health ($p = 0.012$), and H2 (a) is accepted. This result supports the existing research, as indicated

by the following literature. Optimism may substantially influence mental and physical health and promote a healthy lifestyle (Conversano, *et al.*, 2010). Peterson and Bossio (2001) reviewed several studies on optimism and health and found associations between optimistic explanatory style and positive health outcomes, including general health. Resilience was significantly related to health ($p = 0.026$). So, H2 (b) is accepted. This finding gets support from previous studies. Resilience has been shown to be associated with mental and physical health among older adults (Mehta, *et al.*, 2008; Schure, *et al.*, 2013). Schure et al. (2013) have also demonstrated that higher levels of resilience are associated with better physical health and lower chronic pain. Resilience has also been shown to be associated with successful aging (MacLeod, *et al.*, 2016).

Surprisingly, the present study did not find a significant relationship of gratitude with coping and health, and there was no support for H1(c) and H2 (c). Gratitude is 'an emotional appreciation of and thankfulness for favors received' (Emmons & McNamara, 2006). None of the participants in the present study was affected by the Coronavirus, so they were not supported by the doctors, some other helpers, or family members. This may be a reason for not finding a significant relationship. Future studies comparing Covid-19 affected and not-affected individuals can shed significant light on this issue.

Sociodemographic groups indicated a vital pattern of relationships. Values of adjusted R^2 (which varies from 0. 233 to 0. 556) and F-ratio indicated that all except a couple of relationships were strong and significant. The value of adjusted R^2 for health for the low socioeconomic status was weak (0.166), though significant (F: 6.30, $p < .001$). In general, optimism and resilience showed significant relationships with coping and health. Gratitude showed a significant relationship with health ($\beta = -0.44$, $t = -2.41$, $p = 0.018$) in only males. Based on the relative values of standardized parameter β, two interesting inferences can be made: (i) the effect of optimism on health was much stronger (almost twice) as compared to that of resilience in all cases, except for females; and (ii) for coping, the effect of optimism

was weaker than that of resilience for high socioeconomic status, females, nuclear family, and the higher age group, while it was stronger in remaining cases. Previous studies support the current findings. Several studies prove a positive relationship between optimism and resilience (He, *et al.,* 2013 & Riolli, *et al.,* 2002).

In Government guidelines regarding the covid, individuals need to adopt other means of keeping safe and improving their quality of life. A long-term study reported that older people face anxiety, loneliness, depression, and mood swings during this pandemic, increasing the risk of cardiovascular, neurocognitive, autoimmune, and mental health disorders (Santini, *et al.,* 2020). Growing a mature sense of gratitude through acts of kindness, expressing gratitude for life and God, and taking pleasure in all the little things in life helps people deal with the current threats of COVID-19 and build resilience for the future (Jans-Beken, 2021).

Implications and Limitations

The present study was conducted during the prevalence of covid 19 when people, especially the elders, were highly concerned and anxious about their safety and well-being. Based on the result of the study, we can infer that optimism and resilience can help in coping and health in every crisis or pandemic situation. The older people, the younger population, and children are equally affected. Therefore, the youth and child population can be included as a research sample in future research. We can also include other variables like patience, positivity, psychological immunity, and other dimensions of physical health, providing us with pervasive and broader implications for society.

The present findings are new and beneficial for society, but some aspects could not be included due to the covid pandemic. Collecting extensive and diversified data from other populations, such as older people living alone, in old age homes, and in rural areas was impossible. Exploring those aspects that could illuminate new dimensions of personality correlates and knowledge to society was impossible. Due to covid, detailed face-to-face interviews were not conducted,

revealing certain emotions and hidden aspects of personality not visible in the online mode. Future research can be more extensive and diversified so that wider dimensions of personality can be explored in older people.

Conclusion

The present study revealed that optimism and resilience are positively correlated. It was also concluded that gratitude was not correlated with coping and health, but it was correlated with the health of males, so it is also an essential factor in achieving good health. A very substantial finding was that optimism and resilience are strongly correlated with coping and health among older people, indicating optimism and resilience are powerful personality determinants for healthy and happy aging. Based on the result, it can be concluded that the effect of optimism on health is almost twice as stronger as that of resilience in all cases except for females.

Furthermore, optimism and resilience are associated with better physical health and coping, which is good for successful ageing in every challenging circumstance. Therefore, these personality determinants would help older people maintain good health and coping behaviour.

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What Determines Co-residence of Older Adults with Married Children? An Empirical Study in Siliguri, West Bengal

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ABSTRACT

The purpose of this study was to investigate the relative importance of different background characteristics of the 256 older adults(148males, and 108 females),sixty years and above, in determining their co-residence with married children. The analysis of data revealed that elderly people with higher age, widowed elderly, and elderly assess their health as 'unhealthy' and have a higher chance to live with married children. Aged women are less likely to live with married children than elderly men, and income has no effect on living arrangements. However, the ownership of the house is likely to increase the possibility of living with married children only in the case of elderly women but not in the case of elderly men.

Keywords : Older Adults, Living Arrangements, Marital Status, Multigenerational Household, Familism.

The living arrangements of older adults have paramount importance for their overallwell-being.The range of care and support received by community-dwelling older adults largely depends upon the composition of the households of elderly persons.The elderly people who live with their unmarried and/or married children are expected to have better access to care and support from their family members than those senior citizens who live separately from their children. Particularly, in a country like India where a majority of the elderly population falls outside the ambit of social security measures,the bulk of the aged population depends solely on family for care and support. In this respect, anylarge-scale alteration in the living arrangements of older adults would have a long-term effect on their well-being.

In Indian tradition, the patrilineal multigenerational household has remained an ideal form of living arrangement from time immemorial. Under such living arrangements, sons after marriage are expected to continue their staying with their parents along with their wives and children. The primary responsibility of taking care of older persons,insuch multigenerational households,is bestowed upon the adult sons and their wives, in particular, and other younger members of the family, in general. However,it is not that the older adults only receive care and support from other family members but they also shouldera considerable amount of the family burden such as household chores, taking care of grandchildren, resolving familial conflicts, and directing the younger members of the family at the time of crisis, etc. (Panigrahi, 2013). In short, such a multigenerational joint household is built upon the principle of mutual rights and obligations of different generations towards each other.

However, under the influence of increasing urbanization, industrialization, and modernization of Indian society, such multigenerational households are splitting into several nuclear households. Adult children are establishing separate living arrangements from their ageing parents. Downsizing of the family, mobility of the younger members of the family to distant places for education and

employment, progressive participation of women folk in gainful economic activities, diminishing dependency of adult children on family income and resources, undermining of traditional values of familism and replacement of such values with individualism, expansion of social security measures for older adults, etc. are greatly influencing the care of elderly in the Indian Society (Gangrade, 1987; Bali, 1999; Khan, 2004; Panda, 2005: 20; Ghosh Maulik, 2006; Chakrabarti, 2007; Mohapatra, 2011). The longitudinal study to assess the validity of such a hypothesis in the Indian context, however, is still missing.

The large-scale nationwide surveys, like National Sample Survey, 60th Round (2004) or Building a Knowledge Base on Population Aging in India (BKBPAI) Survey (Jadav,*et al.*, 2013), on the elderly population in India reveals the fact that till date co-residence with children is the most prominent form of living arrangement for senior citizens in India. Simultaneously, the surveys also depict that about 15 per cent to 20 per cent older adult population either live alone or with a spouse only. The small-scale empirical studies conducted in different parts of the country also unveil similar tendencies of living arrangements of elderly people in India as demonstrated by nationwide surveys (Dandekar, 1996: 180; Kohli, 1996: 83; Panda, 2005: 63; Mohapatra, 2011; Agarwala and Saikia, 2014).

Further, there are some scholars who have tried to comprehend the living arrangements of senior citizens in India on the basis of some important socioeconomic and demographic factors (Audinaryana, *et al.*, 1999; Sudha, *et al.*, 2007; Muthukrishnaveni, 2011; Pal, 2004; Panigrahi, 2009, Panigrahi, 2013; Jadav, *et al.*, 2013; Pal and Varma, 2016). But the findings of these studies are often contradictory to each other. For instance, a broad range of studies has reported that older adults belonging to relatively younger age groups are more likely to live with children than their counterparts (Audinaryana, *et al.*, 1999; Sudha, *et al.*, 2007; Muthukrishnaveni, 2011; Jadav,*et al.*, 2013),whereas the opposite result has been reported by Panigrahi (2013) in his analysis of NSS 60th round data on elderly population from Kerala and Uttar Pradesh. Similarly, in respect of gender

differences while most of the studies found that elderlymales are more likely to co-reside with children (Sudha, *et al.,* 2007; Muthukrishnaveni, 2011; Jadav, *et al.,*2013), but, Pal and Varma (2016) observed that it is the elderly women who are more likely to live with children.

Living arrangements of older adults according to their marital status are very critical components for the overall understanding of their support system. An elderly person can afford separate living from children if the spouse is alive. But when her or his spouse is dead, she or he becomes more dependable on children and on others for different kinds of instrumental, associational, or emotional support, even in those cases where the person is financially self-supportive. At this point, if an older adult is bound to live separately from her or his children that might severely impend her or his overall well-being. Some studies in this regard suggest that married elderly persons have greater chance to live with children than widowed elderly persons (Audinaryana, *et al.,* 1999; Jadav, *et al.,* 2013), but the reverse tendency has been reported by Sudha, *et al.,* (2007) in their study on older adults in four states of South India.

The financial condition of the senior citizens as a determinant of living arrangements has received relatively greater attention from the scholars. It is often argued that older adults with better financial condition has to depend list on children for support which may encourage separate living (Panigrahi, 2009). There is also counter viewpoint, which argues that the resourceful older adults extract more support from family including co-residence with childrenthan their counterparts (Sudha, *et al.,* 2007) or the economic resources of the parents may attract the children particularly the unemployed to co-reside with their aging parents (Pal, 2004). The findings of some studies if uphold the first argument (Audinaryana, *et al.,* 1999; Pal and Varma, 2016; Panigrahi, 2013); there are also studies which strongly defend the later (Pal, 2004; Sudha, *et al.,* 2007; Muthukrishnaveni, 2011; Jadav, *et al.,* 2013)

Yet another important determinants of co-residence of older adults is their health status. Like all previous variables, findings of different

research works in this respect are also inconsistent with each other. While some studies observed that older adults with poor health condition are more likely to live with children (Audinaryana, *et al.*, 1999), Pal (2004) observed that aged people suffering from some kind of health problems are more likely to live separately from children. Sudha, *et al.*, (2007) have found no impact of the health status of elderly people on their living arrangements. However, the findings of most of the studies,on the question of how educational status influences the living arrangements of older adults, resemble each other. It is mostly found that increasing educational status reduces the possibility of cohabitation of senior citizens with their children (Panigrahi, 2009; Jadav, *et al.*, 2013; Agarwala and Saikia, 2014).

It is clearly evidenced from the above discussion that the findings of different research work on the question of how the living arrangements of elderly persons in India are influenced by different socio-economic and demographic factors are rather an inconsistency from each other, and more research is needed across the country to reach any definite conclusion. Further, most of these studies have not dealt with the issues of co-residence of elderly persons with married children separately from unmarried children. But, in the Indian context, the living of parents with unmarried children is quite universal. Most of the studies on aging in India implicitly recognize that the co-residence of aged persons with children becomes problematic only after the marriage of children, particularly after the marriage of sons, when the sons also develop another nuclear unit within the larger family. However, studies on the living arrangements of older adults in India hardly address the issue. Therefore, in the present study, a modest attempt has been made to investigate the phenomenon of co-residence of older adults with married children in order to reflect further on the issue of the living arrangements of elderly persons in India.

Objectives

In the light of the above discussion, the present study attempted to examine the following objectives:

(i) To find out the different forms of living arrangements of older adults;

(ii) To examine the significance of age, sex, marital status, health status, and economic condition of the elderly people, in determining the co-residence of older adults with their married children,

Method

Sample

The present study was conducted in four localities namely Vivekananda Pally, Sukanta Nagar, Deshabandhupara, and Pal Para come under jurisdiction of Ward No. 30 and Ward No. 38 of Siliguri (W.B.) Municipal-Corporation. In the study area total 858 older adults (60 years and above) were identified with the help of electoral roll, out of which, a sample of 256 aged (males = 148 and 108 elderly females) who had at least one married child, were randomly selected for interview.

Tool Used

A standard interview schedule was used to collect the demographic information, information related to their health, family life, and psychological aspects, and about their living arrangements.

Statistical Analysis

Initially, the patterns of living arrangements of the older adults and their background characteristics were analyzed with frequency distribution and percentage. In order to examine the net effect of each of the independent variables on the co-residence of older adults with married children, by controlling the other variables, binary logistic regression was applied. The following variables were taken into consideration for logistic regression analysis:

Dependable Variable

Living Arrangements of the Older Adults	('1' if Live with Married Children and '0' Otherwise)

Explanatory Variables	
Gender of Older Adults	('1' if Male and '0' if Female)
Age of the Older Adults	(In Completed Years)
Marital Status of the Older Adults	('1' if Married and '0' if Widowed)
Educational Status of the Older Adults	(In Completed Years of Education)
Income Statusof the Older Adults	(Actual Monthly Income of the Respondent and Her/His Spouse in Rupees)
Ownership of House	('1' if Having Sole/Share in Ownership Either of the Respondent or Her/ His Spouse or Both and '0' if Not)
Heath Status of the Older Adults	('1' if Fairly All Right and '0' if Unhealthy)

Result and Discussion

Socio-economic and Demographic Characteristics of the Respondents:

Table 1 presents the socio-economic and demographic characteristics of the respondents by sex. Considerable differences can be observed between female and male respondents. Eighty-eight per cent of male respondents contrasted to 36 per cent of women respondents who are found currently married, and 12 per cent of men versus 64 per cent of women report being widowed. The illiteracy rate is also found higher among female respondents than males; whereas, 32 per cent of elderly men have education up to U.G. level or above, but the corresponding figure for elderly women is only 6 per cent. Similarly, in terms of monthly family income or ownership of the house, women respondents lag behind men counterparts. But no significant difference was observed in between female and male respondents in terms of subjective health perception. Thus, it is found that widowhood is much common among the elderly women and they remain in more disadvantage position then elderly men in terms of education, income and control of resources.

Table 1

Socio-economic and Demographic Characteristics of the Respondents

Variables	Female (N= 108)	Male (N= 148)
Age:		
60-69 Years	51 (47)	69 (47)
70-79 Years	42 (39)	59 (40)
80 Years and Above	15 (14)	20 (13)
Marital Status:		
Currently Married	39 (36)	130 (88)
Widow	69 (64)	18 (12)
Educational Status:		
Illiterate	18 (17)	9 (6)
Primary Level	24 (22)	11 (7)
Middle School	24 (22)	17 (11)
Secondary Level	27 (25)	39 (28)
Higher Secondary	9 (8)	24 (16)
UG and Above	6 (6)	48 (32)
Monthly Income:		
< Rs. 5000/-	63 (58)	41 (28)
Rs. 5000/- to < Rs. 10000/-	20 (19)	48 (32)
Rs. 10000/- to < Rs. 15000/-	10 (9)	26 (18)
Rs. 15000/- e”	15 (14)	33 (22)
Sole/Share in Ownership of House:		
Yes	84 (78)	141 (95)
No	24 (22)	7 (5)
Subjective Health Perception:		
Fairly All Right	75 (69)	102 (69)
Unhealthy	33 (31)	46 (31)

* Figures in parenthesis indicate the percentage

Living Arrangements of the Respondents

The living arrangements of the elderly also depict considerable gender differences. The phenomenon of living alone is more prominent among female respondents than males. Similarly, 75 per cent of elderly women versus 57 per cent of elderly men live with married sons. However, living with unmarried children and with spouse only are more common among men than women respondents. Living with married daughters is very uncommon which corresponds that traditional mindset is still playing vital role in formation of living arrangements in India.

The reason for the gender differences of living arrangements can be attributed to the gender differential of age at marriage between husband and wife in Indian society, and consequently higher rate of widowhood among women than men. In India, most of the women usually marry a person with higher age. It is, therefore, quite obvious that husbands die before than wives in most of the cases. Those elderly women who live with spouse only, after the death of husband have a possibility to live alone, but such possibility in case of elderly men is relatively low because of the low rate of widowhood among them. This is one of the main reasons for higher incidence of living alone among elderly women, and 'living with spouse only' among elderly men.

Further, the vital events in life like marriage, birth of children or marriage of the children occur relatively in advanced age in case of men than women because of their relatively higher age at marriage. Therefore, when men reach the age of 60 years or above, some or all of their children may remain unmarried, but, such possibility in case of women is relatively remote because of early age of progeny. These differences can explain the phenomena of higher percentage of elderly men living with unmarried children and higher percentage elderly women living with married children. However, the significance of different factors in determining the co-residence of elderly people with married children will be discussed in next section. The living arrangements of elderly women and men have been portrayed in Table 2.

Table 2

Living Arrangements of the Respondents

Living Arrangements	Women	Men
Living Alone	9 (8)	1 (1)
With Spouse Only	12 (11)	30 (20)
With Unmarried Children	9 (8)	26 (18)
With Married Son	75 (70)	85 (57)
With Married Daughter	3 (3)	6 (4)
Total	108 (100)	148 (100)

* Figures in parenthesis indicate percentage

Determinants of Co-residence of Older Adults with Married Children

In this section, the relative contribution of different socio-economic variables in determining the co-residence of elderly people with their married children has been analyzed. Since, all these variables operate simultaneously, it is necessary to control the effect of other variables in order to find out the net effect of each of the individual variables.Hence, a multivariate analysis is needed to assess the magnitude of effect of each of the variables. Meanwhile, in the present analysis the dependable variable is dichotomous in nature (Whether living with married children '1' or otherwise '0'), therefore, binary logistic regression has been applied on the data. The results are presented in Table 3.

The results depict that with the augmentation of age, the likelihood of living of older adults with married children increases for both sexes, but, and it is statistically highly significant only in case of women in respect of men, the relationship is not statistically significant.The widowed elderly men has significantly a greater chance to live with married children then married aged men. Among the widowed elderly women have also a greater possibility to live with married children then married elderly women, but statistically turned out to be insignificant. Subjective health perception of the older adults is positively connected with living with married children (i.e. elderly who perceived

them as 'unhealthy' are more likely to live with married children than those who perceive their health as 'fairly all right') but statistically turned out to be significant only for elderly men.

Table 3

Logistic Regression Analysis of the Living Arrangements of Older Adults for Both Sexes

Explanatory Variables	Person		Female		Male	
	β	**Odds Ratio Exp. (β)**	**β**	**Odds Ratio Exp. (β)**	**β**	**Odds Ratio Exp. (β)**
Gender	-.181	.835	-	-	-	-
Age	.090	1.094**	.199	1.221**	.034	1.035
Marital Status (1)	1.011	2.750*	.268	1.307	1.795	6.022*
Education	-.051	.951	-.097	.907	-.020	.980
Income	.000	1.000	.000	1.000**	.000	1.000
Ownership/Share of House (1)	.045	1.046	-.384	.681	.589	1.801
Health Status (1)	.624	1.867	.011	1.011	.972	2.644*
Constant	-5.242	.005	-10.855	.000	-2.090	.124
N =	256		108		148	
Log Likelihood =	278.471		83.826		177.673	
P =	.000		.000		.002	

Note: ** = Significant at .01 level

* = Significant at .05 level

The results also reveal the effect of other variables on co-residence of older adults with married children but these results are statistically insignificant. Women are less likely live with married children then elderly men. Further, income has no effect on living arrangements of older adults, but ownership or share in house property increases the likelihood of co-residence of elderly women with married children, but not in case of elderly men. Grater the educational level of older adults, lesser the possibility to live with married children.

Conclusion

In the present investigation, living with married sons has been found as the most prevalent form of living arrangement among the senior citizens followed by 'living with spouse only'. The phenomenon of living alone is found more among elderly women whereas living with spouse only and living with unmarried children is more common among elderly men. Very few older adults are found who live with married daughters. This depicts the fact that the patriarchal values of the society is still playing a vital role in determining co-residence of older adults with married children.

The multivariate analysis reveals that increasing age, widowhood and poor subjective health perception increase the probability to live with married children. Income has no effect on living arrangements, whereas the ownership of house is only important in respect of elderly women. As per the result of present investigation, the higher level of education reduces the possibility of older adults to live with married children. If expansion of education is considered as an indicator of modernization, than it can be surely said that at least in this respect modernization hypothesis holds true.

Overall, the present investigation indicates that parental difficulties like widowhood, increasing age, or poor health playa more vital role in determining the co-residence of older adults with their married children than their control over economic resources. But, these findings should be read with great caution. Because the present study was conducted in an urban area with a relatively small sample size and the majority of the respondents belong to middle-class families. So the findings may not hold true in another social context. In order to get a larger picture of the determinants of living arrangements of older adults in India, rural-urban comparison and class wise comparative studies should be the imperative in future.

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Influence of Loneliness on Depression Among the Elderly Living in Chennai

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ABSTRACT

Loneliness and depression are common problems significant in a portion of the elderly population. The study's aim was to understand the relationship between loneliness and depression among the 100 elderly, (42 females, and 58 males), ages varying from 60 years and above, both living (N-50) and not living in old-age homes (N=50) in Chennai. Depressive symptoms were measured using Geriatric Depression Scale: Short Form (GDS: SF) and loneliness, using UCLA-R Loneliness Scale. Results revealed that there is a strong relationship between loneliness and depression in the elderly, and the elderly who do not live in old age homes felt lonelier than the elderly who live in old age homes.

Keywords: Loneliness, Depression, Elderly, Old age Homes.

Aging is a dynamic process that influences the biological, physiological, environmental, psychological, behavioural, and social aspects of a human being. From the mid-60s, it is the period of development known as late adulthood. According to Erikson's (1993) stages of development,this stage is called ego *integrity vs. despair.*

Late adulthood reflects on their lives and they feel either a sense of satisfaction or a sense of failure. People who feel proud of their accomplishments feel a sense of integrity, and they can look back on their lives with minimal regrets. On the other hand, people who are not successful at this stage may feel as if their life has been wasted. They focus on what "would have," "should have," and "could have" been. They face the end of their lives with feelings of bitterness, depression, and despair. Some age-related changes are benign, such as greying hair. Others result in declines in the function of the senses and activities of daily life and increased susceptibility to and frequency of disease, frailty, or disability. In fact, advancing age is the major risk factor for several chronic diseases in humans. There are many people who aspire to age gracefully with minimal suffering, however, reality proves otherwise.

Interaction with other humans is a powerful and universal need of human beings. The lack of interaction is detrimental to one's well-being. Loneliness has also now become a salient feature of aging that is understood as an emotion and an indicator of social well-being. A substantial literature documents that loneliness, a subjective psychological construct distinct from objective measures of social isolation, is related to a range of negative outcomes, including mortality, depression, and cognitive decline (Cacioppo, and Hawkley, 2009).

Loneliness is described as a state of emotional distress due to incongruity between actual and desired levels of social interaction (Peplau, and Perlman, 1982). Moreover, it is explained as a lack of meaningful social relationships (Fees, *et al.,* 1999). It is associated with decreases in health status and quality of life. (Laura Alejandra Rico-Uribe Laura Alejandra Rico-Uribe , *et al.,* 2016) One of the most obvious symptoms of loneliness is that it makes people feel sad, and research on the measurement validity of loneliness established the discriminant validity of loneliness from correlated constructs such as depressed affect. For instance, psychometric analyses have shown that loneliness and depressive symptomatology are stochastically and

functionally separable (Russell, *et al.,* 1980;Cacioppo,*et al.,* 2006; Vanderweele,*et al.,* 2011)

According to DSM 5, Depression, otherwise known as major depressive disorder or clinical depression, is a common and serious mood disorder. Those who suffer from depression experience persistent feelings of sadness and hopelessness and lose interest in activities they once enjoyed. Aside from the emotional problems caused by depression, individuals can also present with physical symptoms such as chronic pain or digestive issues. To be diagnosed with depression, symptoms must be present for at least two weeks (American Psychiatric Association, 2013).

It cannot be denied that depression and loneliness reduce the quality of life and make the elderly become dependent on others. They, in fact, suffer from impairment of major domains of life. This includes personal care, family responsibilities, and social and occupational capabilities. Since old age is a period of decline, many tend to live a sedentary lifestyle and are more socially withdrawn.

Need for study

The community-based mental health studies in India have revealed that the point prevalence of depressive disorders in the elderly Indian population varies between 13 percent, and 25 percent (Nandi, *et al.,* 1976; Ramachandran, *et al.,* 1982).

Considering the fact that loneliness and depression are commonplace among the elderly, it is integral to examine the levels of it and mitigate it in an effective manner as ageing population increases in a country like ours.

There is minimal research done on the correlation between loneliness and depression among the elderly in Chennai and comparing the levels among those living and not living in old-age homes. Hence, a study was undertaken to assess the extent and degree of depression in the elderly and find out how correlation like loneliness is associated with it.

Objectives of the study

- To measure the levels of loneliness and depression of the sample studied
- To find out the relationship, if any, between loneliness and depression
- To identify a significant gender difference in the scores of loneliness and depression
- To identify a significant difference in the scores of loneliness and depression among the elderly living in old-age homes and elderly not living in old-age homes.

Method

Sample

A total of 100 participants, 42 females, and 58 males, (50 participants were living in Old Age Homes and the other 50 participants were not living in Old Age Homes), ages varying from 60 years and above, were chosen through convenience sampling from Chennai, (Tamil Nadu).

General instructions were given to the participants and they were assured of the confidentiality of the data. The number of responses received was100 and the number of responses rejected was 14.

Tools used

1. The Geriatric Depression Scale(Short Form), consisting of 15 questions developed by Niederehe, G. (1986). Out of the 15 items, 10 indicated the presence of depression when answered positively, while the rest (question numbers 1, 5, 7, 11, 13) indicated depression when answered negatively. Scores of 0-4 are considered normal, depending on age, education, and complaints; 5-8 indicate mild depression; 9-11 indicate moderate depression; and 12-15 indicate severe depression. It takes about 5 to 7 minutes to complete.
2. UCLA Loneliness Scale (Russell, D., 1980) is a 20-item scale designed to measure one's subjective feelings of

loneliness as well as feelings of social isolation. Participants rate each item as either O ("I often feel this way"), S ("I sometimes feel this way"), R ("I rarely feel this way"), or N ("I never feel this way").

3. A questionnaire containing all the demographic details such as age, gender, educational background, and place of living, was also used.

Statistical Analysis

Tests of significance were used to find the gender differences and differences in loneliness and depression for the elderly living and not living in old age homes. Pearson product-moment correlation was used to find the relationship between loneliness and depression among the elderly using the software IBM SPSS Statistics 20.

Results and Discussion

Table I

Shows the Mean (M), Standard Deviation (SD), and t values in loneliness and depression values for the two genders

*p<.05

Variable	Group						t	Sig 2 tailed
	Male		Female		Overall			
	Mean	SD	Mean	SD	Mean	SD		
Loneliness	18.43	5.852	17.83	5.903	18.08	5.860	.504	.615
Depression	4.14	3.579	4.00	3.146	4.06	3.318	.212	.833

From Table I, it is seen that there is no statistically significant gender difference in the loneliness scores {t (98) = .504, p<.05. It is also seen that there is no statistically significant difference between the genders in the depression scores. t(98) = .212, p<.05. Hence hypothesis 2 and 2.1 is accepted.

Results reveal that there are no significant gender differences in the elderly persons with respect to loneliness and depression, i.e., both male and female elderly persons equally experience feelings of loneliness and depression. The lack of significant gender differences in loneliness reflects the fact that since both the groups contained elderly couples, with partners being alive, living with children, or peers at old age homes the chances of their feeling lonely were low. The lack of significant gender differences in depression is contrary to the often-held belief and research reports found strong empirical evidence for the gender difference in depression among older adults aged 60 and above. Older women scored higher than older men on dimensional measures of depressive symptoms and older women have higher rates of diagnosis of unipolar depression compared to older men (Girgus, *et al.*, 2017). This result is not in line with what has been reported in the literature. The findings of no significant gender differences with respect to depression may be attributed to the fact that this is rather recent research.

Table II

Shows the Mean (M), Standard Deviation (SD), and t values in loneliness and depression for the elderly living and not living in old age home

*p<.05

Variable	Group						T	Sig 2 tailed
	Elderly living in Old Age Home		Elderly not living in Old Age Home		Overall			
	Mean	SD	Mean	SD	Mean	SD		
Loneliness	16.80	6.269	19.36	5.170	18.08	5.860	.2.228	.028
Depression	3.78	3.234	4.34	3.408	4.06	3.318	-.843	.401

From Table II, it is seen that there is a statistical difference in the loneliness scores between the elderly living in old-age homes and the

elderly not living in old-age homes. { t(98) = -2.228, p<.05. It is also seen that there is no statistically significant difference in the depression scores between the elderly living in old-age homes and the elderly not living in old-age homes.{ t(98) = -.843, p<.05. Hence hypothesis 3 is rejected and hypothesis 3.1 is accepted.

Results indicate that the elderly who do not live in old-age homes feel lonelier than the elderly who live in old-age homes.Many elderly who do not live in old-age homes are often neglected. The elderly living in old age homes mostly have caretakers, peers, and activities to engage themselves in. On the other hand, the elderly living outside may lack a caretaker and have working children.Natural events such as losses and widowhood, and factors associated with aging (e.g., poor health and functional impairment), poor level of income leading to isolation, or societal changes such as the migration of younger people from the countryside to cities (Savikko, *et al.,* 2005).

Table III

Shows the correlation values between loneliness, depression and age

Variable	1	2	3
Loneliness	1	.504**	-.231*
Depression	.504**	1	.005
Age	-.231*	.005	1

From Table III, it is seen that there is a statistically significant positive relationship between loneliness and depression, r (98) = .504, p<.01. And hence, hypothesis 1 is accepted.

From the results above, it can be seen that there is a strong positive correlation between loneliness and depression. This means that as loneliness increases, depression is likely to increase. Loneliness is in fact considered to be one of the social risk factors according to (Fiske,

A. *et al.*, 2009). A possible explanation for this may be that feeling lonely not only depends on the number of connections one has with others but also on whether or not one is satisfied with his lifestyle. An expressed dissatisfaction with available relationships is a more powerful indicator of loneliness (Revenson, 1982). Wang, J., *et al.*, (2018) substantiates that there is substantial evidence that less perceived social support at baseline tends to predict greater symptom severity, poorer recovery/remission, and worse functional outcomes at follow-up among people with depression, and preliminary evidence of a similar relationship for people with bipolar disorder, or anxiety disorders. There is also some evidence that greater loneliness is associated with more severe depression and anxiety symptoms and poorer remission from depression.

It was also found that not all who are lonely are also depressed, and loneliness is not a necessary part of depression, but we may conclude that loneliness is a potential risk factor for depression in these independent-living residents. (Adams, K. B. *et al.*,2004)

Conclusion

- A significant positive correlation exists between loneliness and depression in the elderly living in old-age homes and not living in old-age homes in Chennai.
- No gender differences were found between loneliness and depression among the elderly
- Elderly who do not live in old-age homes feel lonelier than the elderly who live in old-age homes.

Implications

Mental health experts, families, and communities can take several measures to actively engage their elderly with activities and help them join social groups to combat loneliness and depression. Depression in late life is treatable, even among older adults with dementia. Empirical evidence indicates that behavioral therapy, cognitive-behavioral therapy, cognitive biblio -therapy, problem-solving therapy, brief psychodynamic therapy, and life review/reminiscence therapy are

effective but too infrequently used with older adults. Specialized, evidence-based approaches have been developed for individuals with dementia and for caregivers. Other prevention interventions target older adults at risk of depression due to physical illness and disability, bereavement, and caregiver status. Interventions that have the most empirical support include individual therapy for at-risk bereaved older adults, educational interventions for subjects with chronic illness, cognitive-behavioral interventions to reduce negative thinking, and life review.

Limitations

- The sample size was restricted to a few English-speaking elderly persons and surveyed on a small size in Chennai.
- Self-report inventory was used for determining the level of depressive symptoms in elderly persons.

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Effects of Pilates Training on Fear of Fall and Balance in elderly people

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ABSTRACT

This experimental study aimed to determine the efficacy of Pilates exercise on the fear of falls and balance in 30 elderly. They were divided into two groups, the Experimental Groupwith Pilates exercises [EG] and the Control Group with conventional balance training exercises[CG]. All participants were given 45 minutes exercises thrice/a week for 4 weeks. Outcome measures were Fall Efficacy Scale, modified CTSIB, Limits of Stability, and Tandem walk. The confidence interval was kept at 95 per cent. The results revealed that fear of falls was improved significantly for EG (p = 0.001) while for CG, there was no significant improvement (p= 0.942), was noticed. Mean COG sway velocity for EG was significantly reduced using a foam surface with eyes closed (p=0.003) whereas CG showed a significant difference on a firm surface with eyes closed (p = 0.02). Dynamic balance measured through limits of stability for movement velocity and directional control subcomponents showed mainly nonsignificant improvement in both groups except for

the left side. On the basis of the present findings, it may be concluded that 4 weeks of Pilates and Conventional balance training showed improvements in fear of falls whereas Static and dynamic balance need to be further studied with a longer duration of intervention for its efficacy.

Keywords :- Ageing, Balance Master, Balance training, Falls Efficacy Scale

Ageing is the process in which the number of cells comprising the body decreases, the activity of each cell degrades, physical adaptability is gradually lost and ultimately leading to death (Spirduso, W. *et al.,* 2005). Elderly people have many risk factors for contracting disease due to ageing and lack of exercise.(Hyun J, *et al.,* 2014) The major area of concern is the health of the elderly with multiple medical and psychological problems. Falls and unstable balance rank high among serious clinical issues and constitute two-thirds of these deaths. (Lord SR, *et al.,* 1991; Subramanian, and Premraja 2007). The risk of falls increases beyond 60 years of age (Rubenstein 2006).There is a strong association between fear of falling and measures of balance and mobility(Rubenstein LZ, *et al.,*1988). Thus balance assessment training and fall prevention are helpful in counteracting these age-related functional declines and aid in prolonging independence in elderly individuals.(Joshi K, *et al.* 2003) Psychological factors, such as fear of falling, may also contribute to these changes in balanceand mobility (Myers A, *et al.,* 1996, Maki, B.E.1997, Yoshida-Intern S. 2007).

In order to maintain stability and balance, a complex mechanical and neurological mechanism must work in synchrony to control the changes in motor output. Many health professionals educate older persons about how to prevent falls from happening. The educational advice recommends older people attend exercise classes such as Tai Chi, Pilates, and yoga to improve balance control (Whyatt, C *et al.,* 2015). Conventional balance exercise which includes strength training and endurance, maximizing flexibility, and postural control have been proven effective in improving functional ability in addition to reducing the risk of falls in elderly individuals (GusiN. *et al.*, 2012; Means KM *et al.,* 2005).

Pilates, developed by Joseph Pilates in 1920, is a popular exercise program of physical fitness that uses a combination of muscle strengthening, lengthening, and breathing to develop trunk muscles and restore muscle balance and it can be used by all age groups (Bernardo, LM. 2007; Cozen DM., 2000; Smith K. and Smith E, 2005). Older adults may benefit from Pilates through core strengthening, improvements in posture, postural stability, joint mobility, balance, and coordination (Segal NA *et al.,* 2004).Recent research explains the efficiency of Pilates in health, especially in physiotherapy and rehabilitation and also it has psychological benefits as well as improvements in elderly person's quality of life (Barrocal *et al.*, 2017; Da Silva and Mannrich, G. 2009; Fleming KM and Herring MP., 2018; Torales, *et. al.,* 2019; Goedert A. *et al.*, 2019; PucciGC. *et al.*, 2019). If balance improves then, it will reduce the incidence of falls in the elderly. Hence the objectives of this study were to determine the efficacy of Pilates exercise on the fear of falls and balance in elderly people.

Method

Participants were recruited from in and around Pune and the study setting was Dr. D. Y. Patil College of Physiotherapy Pune, Maharashtra, India, after the approval from Institutional Ethics Committee with reference No. DYPCPT/ISEC/05/2015. A total of 30 elderly participants were recruited after screening for Inclusion and exclusion criteria. Inclusion criteria for the selection were elderly people of age 60–70 years, not participating in any sports or physical therapy sessions, willing to do physical exercise thrice a week with regular attendance, and Fear of fall scoring > 20 on 16 item Falls Efficacy Scale – International. Exclusion criteria were neurological disorder (i.e. Parkinson's disease, multiple sclerosis, head injury, peripheral neuropathy, stroke, vestibular disorder) and musculoskeletal disorder (i.e. joint replacement, amputation, physically limiting arthritis, and fracture cases). Written Informed consent was obtained from all the participants. Demographic data were collected and they were asked about their past medical history of hypertension, and diabetes, and about any recent surgical history in the past year. This was documented for all the patients. A questionnaire form was filled out by all participants through the interview method for measuring fear of falls

through the Fall Efficacy Scale - International (FES-I). They were then divided into two groups, the Experimental Group [EG] and Control Group [CG] through randomization (Computer generated random numbers). Baseline parameters for static and dynamic balance such as modified CTSIB, Limits of stability, and Tandem walk were assessed for all individuals through NeuroCombalance master. Participants of the experimental group were given Pilates exercises (Table No. 1) for 4 weeks, 3 times a week 45 minutes foreach session. Mat Pilates, Ball Pilates, and Standing Pilates exercises were given to all the participants.The control group was given a conventional balance training exercise program during their first visit then they were instructed to do exercises 3 times a week for 45 minutes at home in a safe environment. A list of exercises written in a common language was given to them so that they can follow exercises at home, and instructed to maintain a log book regarding exercises performed, follow-up through phone calls was also taken. After completion of 4 weekly programmes, they were instructed to visit for post-assessment.

Outcome Measures

1. **Fear of Fall:-** Fall Efficacy Scale - International (FES-I) questionnaire assess Fear of Fall, the level of concern is measured on a four-point Likert scale (1 = not at all concerned to 4 = very concerned) (Yardley et al (2005)
2. **Balance**:- Static and Dynamic balance was assessed using NeuroCom Balance master through Modified Clinical Test of Sensory Interaction on Balance (mCTSIB), tandem walk (TW), and limits of stability(LOS). Tandem Walk was assessed with Step width, speed, and End Sway whereas mCTSIB was assessed on firm and foam surface with eyes open and closed. Limits of stability were assessed with movement velocity and directional control.

Statistical Analysis

Data were analyzed using MedCalc 18.2.1 version.The paired t-test was applied forthe assessment of pre and post-meanvalues for both groups. The independent t-test was used to compare both groups. The confidence interval was kept at 95 percent.

Data Analysis and Interpretation

Demographic details were analyzed and age and BMI matching was done. (Table 1) Participants from the experimental group were 15 and fromthe control group were 15. Age and Height of the group A and B participants were not significant indicating both groups are comparable. (Table 1). Pre and Post scores of Fear of falls were statistically significant for the experimental group ($p = 0.001$) while for the control group, there was no significant change in fear of falls ($p= 0.942$).(Table 2) Mean COG sway velocity for the Experimental group was significantly reduced using a foam surface with eyes closed ($p = 0.003$) whereas the control group showed a significant difference on a firm surface with eyes closed ($p = 0.02$). Other parameters showed non-significant differences. (Table 3) When the tandem walk was assessed,it was found that there was no significant difference observed in pre and post-parameters of both groups except for Endsway inthe experimental group and speed in the control group. (Table 4) The non-significant difference was seen in the Limits of stability through the assessment of movementvelocity and directional control for all directions in both groups except the left direction in the experimental group (Table 5 and Table 6).

Static and dynamic Balance measured through the balance master showed significant improvement in static balance assessed through mCTSIB for Foam Eyes Closed (for EG - $p = 0.03$) and for Firm Eyes Closed (CG- $p=0.025$) and tandem walk for End sway (EG - $p= 0.013$)and for speed (CG- $p= 0.018$). Dynamic balance measured through limits of stability for movement velocityand directional control subcomponents showed mainly non-significant improvement in both groups except for the left side. The above results indicate that Pilates and conventional training both need more intensive training to improve balance in the elderly.

Table 1

Shows the demographic details of the participants of both the groups

Particulars	EG	CG	p-value
Total Participants	15	15	
Males	10	6	
Females	5	9	
Mean Age	63.4 +2.8	64+ 4.2	p =0.651
Mean Height	5.23+ 0.32	5.24+ 0.29	p = 0.907
Mean BMI	26.24 ± 2.13	25.89 ± 3.18	p = 0.726

Table 2

Shows the Fall Efficacy Score in Both Groups Pre and Post Intervention

FES score	Pre mean ± SD	Post mean ± SD	Diff. and SD	P values
EG	20.4 ± 4.10	18.87 ± 3.02	1.66 ± 1.34	p = 0.001*
CG	22.73 ± 5.99	22.4 ± 5.79	0.33+0.72	p = 0.096
	p = 0.224	p=0.045*	p= 0.002*	

Table 3

Showsa Modified Clinical test of sensory interaction (m CTSIB) on balance measuring mean COG sway velocity values in the Experimental group [EG] and Control group [CG].

mCTSIB	Pre mean ± SD of EG	Post mean ± SD of EG	P values	Pre mean ± SD of CG	Post mean ± SD of CG	P values
Firm Eyes Open	0.38 ± 0.16	0.34 ± 0.1242	P = 0.334	0.42 ± 0.099	0.48 ± 0.187	P = 0.228
Firm Eyes Closed	0.33 ± 0.096	0.31 ± 0.083	P = 0.653	0.35 ± 0.1506	0.34 ± 0.078	P = 0.025*
Foam Eyes Open	0.97 ± 0.279	0.99 ± 0.17	P = 0.789	1.03 ± 0.179	1.06 ± 0.15	P = 0.762
Foam Eyes Closed	2.2 ± 0.37	1.82 ± 0.2484	P = 0.003*	2.1 ± 0.46	1.99 ± 0.43	P = 0.396

Table 4

Tandem Walk values for the experimental group [EG] and control group [CG].

Tandem walk	Pre mean ± SD of EG	Post mean ± SD of EG	P values	Pre mean ± SD of CG	Post mean ± SD of CG	P values
Step width	9.673 ± 3.49	8.08 ± 1.41	P = 0.110	10.46 ± 3.73	9.92 ± 4.72	P = 0.607
Speed	22.29 ± 5.97	24 ± 6.92	P = 0.157	18.75 ± 3.37	23.16 ± 5.65	P = 0.018*
End sway	5.8 ± 2.844	3.867 ± 1.943	P = 0.013*	6.067 ± 1.773	6.62 ± 4.442	P = 0.638

Table 5

Limits of stability values measuring movement velocity in degree/sec for Experimental and Control group.

LOS MVL	Pre mean ± SD of EG	Post mean ± SD of EG	P values	Pre mean ± SD of CG	Post mean ± SD of CG	P values
Forward	2.69 ± 1.797	3.28 ± 2.561	0.400	3.123 ± 1.639	3.292 ± 1.373	0.44
Right Forward	4.30 ± 1.7	5.06 ± 2.149	0.146	3.24 ± 1.66	4.74 ± 1.95	0.051
Right	4.46 ± 2.835	5.87 ± 2.556	0.134	3.6 ± 2.3	3.415 ± 1.769	0.594
Right Backward	3.82 ± 2.288	3.707 ± 2.103	0.875	3.715 ± 3.086	3.438 ± 2.3	0.794
Backward	2.547 ± 1.33	3.02 ± 1.656	0.309	2.415 ± 1.163	2.862 ± 1.423	0.336
Left Backward	5.33 ± 3.533	5.66 ± 2.01	0.726	3.854 ± 2.243	4.392 ± 1.895	0.521
Left	4.84 ± 2.55	6.607 ± 2.186	0.018*	3.977 ± 1.581	4.054 ± 0.9752	0.862
Left Forward	4.453 ± 1.66	4.76 ± 1.957	0.43	4.262 ± 2.501	3.215 ± 0.959	0.139

Table 6

Limits of stability values measuring directional control in percentage for experimental group and control group.

LOS DCL	Pre mean ± SD of EG	Post mean ± SD of EG	P values	Pre mean ± SD of CG	Post mean ± SD of CG	P values
Forward	77.67 ± 13.84	79.27 ± 7.196	0.707	63 ± 31.79	76.54 ± 16.78	0.146
Right Forward	80.87 ± 11.14	81.2 ± 12.53	0.893	76.77 ± 14.27	73.85 ± 20.24	0.924
Right	75.73 ± 10.58	76.93 ± 8.396	0.639	78.62 ± 12.31	75.54 ± 13.3	0.581
Right Backward	40.27 ± 25.12	46.73 ± 30.03	0.510	40 ± 23.45	49 ± 24.62	0.362
Backward	66.2 ± 25.19	73.47 ± 16.17	0.372	58.38 ± 22.82	60.38 ± 30.54	0.857
Left Backward	61.47 ± 19.63	57.47 ± 25.06	0.636	60.31 ± 20.98	63.38 ± 15.47	0.678
Left	84.2 ± 5.784	78.47 ± 7.945	0.020*	83.92 ± 10.05	82.31 ± 5.36	0.557
Left Forward	70.87 ± 22.04	69.87 ± 13.02	0.802	67.23 ± 17.49	58.15 ± 23.7	0.339

Table 7

Shows the comparison in differences between pre and post-intervention among both

mCTSIB	p-value of pre –pre difference in both groups	p-value of post–post difference in both groups
Modified Clinical test of sensory interaction (m CTSIB)		
Firm EO	0.417	0.022*
Firm EC	0.668	0.316
Foam EO	0.489	0.242
Foam EC	0.517	0.192
Tandem Walk		
Step width	0.556	0.159
Speed	0.055	0.718
End sway	0.760	0.036*
Limits of stability values measuring movement velocity in degree/sec		
Forward Direction	0.496	0.987
Right Forward	0.095	0.673*
Right	0.369	0.005
Right Backward]	0.916	0.741
Backward	0.774	0.781
Left Backward	0.183	0.086
Left	0.275	0.000*
Left Forward	0.807	0.010*
Limits of stability values measuring directional control		
Forward Direction	0.112	0.567
Right Forward	0.388	0.228
Right	0.496	0.865
Right Backward]	0.976	0.823
Backward	0.380	0.153
Left Backward	0.877	0.444
Left	0.926	0.132
Left Forward	0.620	0.104

Discussion

This study evaluated the effect of the Pilates exercise program on static and dynamic balance and fear of falls in healthy geriatric adults aged 60-70 years. Overall 30 participants were selected for the study who were equally distributed in two groups- Experimental and Control groups. This study showed that 4 weeks of training with Pilates exercises significantly reduces the fear of fall using fall efficacy scale.Pilates training has given confidence to the elderly with regards to strength and flexibility which improved the fall efficacy scale score. This result was supported by the study done by Cruz Diaz D. *et al.*, (2015) who performed Pilates on Spanish women over the age of 65 years with chronic low back pain.

This study showed non-significant improvement in almost all parameters of static and dynamic balance except Firm surface Eyes Open test, End sway on a tandem walk, and movement velocity in left and left forward direction. The results were in accordance with the study done by Irez*et al.*,(2011) and Bird *et al.*, (2012) where Pilates training exercises for 4-5 weeks showed non-significant improvement to unstable support surface exercise. Balance is a complicated process involving the integration of the senses, the musculoskeletal system, and the nervous system. Due to the aging process, elderly people undergo degeneration of these functions. Pilates exercises challenge these systems while focusing on breathing, control, centering, precision, concentration, and flow(Pereira MJ. *et al.*, 2022).Proper control of core muscles improves proprioception in the spine thus improving neuromuscular efficiency and thus leading to improvement in balance (Casonatto J andYamacita CM. 2020;Tinetti *et al.*, 1994). Pilates also improves core strength which is an important contributing factor for balance (Means KM. *et al.*, 2005;Kobayashi, *et al.*, 2006) But the interventions used in this study were for 4 weeks, this may be the reason for the non-significant improvement in this study

This study assessed static and dynamic balance measured through different parameters of balance like mCTSIB, Tandemwalk, and Limits of stability. Non—significant improvement on balance parameters may

be due to the insufficient duration of training as most of the studies showed significant improvement by giving pilates exercises training for more than 8 -12 weeks and some over the year. The population included in this study was from Semi-Urban areas.This was a new experience for them, so they felt difficulty understanding the exact pattern at this age and the mechanism of weight shifting or how to lean forward or backward in all directions to assess the limits of stability.

A study on Meta-analysis of pilates training on balance reported that the length of interventions which can be less than 8 weeks or more than 8 weeks is not related to the magnitude of the effect of pilates training on balance. But studies with more than 12 weeks of intervention are very few, similarly, studies with 4 weeks of intervention are rarely available, hence the ideal duration of interventions is still a research question.

Future studies can be performed on the elderly with more duration of pilates interventions on quality of life and balance.

Conclusion

This study concludes that 4 weeks of Pilates and conventional balance training showed improvements in fear of falls whereas Static and dynamic balance need to be further studied with a longer duration of intervention for its efficacy.

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The Pattern of Behavioural Manifestations in the Light of Widowhood

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ABSTRACT

The present study purports to examine whether there are any differences between widowers and widows with respect to their extroversive tone of personality dimension.A totalof 80 aged widowed elderlies (40 widowers and 40 widows) were selected.Eysenck Personality Questionnaire was used as a measuring device. Analysis of the result indicates that widowers are more extravert than their female subsample. To some extent, the ability to initiate their new means of expression after loss actually makes it possible for them to swindle in better ways than widows. An immense negative response from the closer ones may tempt a depressive tone within widows and stand them at the lowest point of this dimension of personality.

Keywords: Widowhood, Ageing, Extraversion, Personality

Considering several changes in life, the end stage of marital relations probably for women is widowhood. The extension beyond between commonness of widowhood and ageing is conspicuously high among women with serious economic and social outcomes. A

large number of elderly widows without many admissions to profits may be entirely dependent on family associates' support. Personality pattern and the way this subsample interact with the external world prove to be a major catalyst in deceiving the pattern of adjustment at a later age. Literature suggests that widows and widowers continue to knowledge lower standard points of personal well-being compared to their pre-loss levels numerous years following the loss of the partner (Lucas, *et al.*, 2003; Yap, *et al.*, 2012). Studies also pointed out evidence of individual differences in the degree to which they react and adjust to widowhood (Parkes, 1987; Bonanno, *et al.*, 2002; Lucas, *et al.*, 2003). It is sensible to think that admittance to compassionate social bonds may be especially significant for coping with the stress of widowhood since widowhood intrinsicallyrequires the loss of an imperative connection. Accommodating system members may offer social camaraderie to widows and widowers; they may help with domestic tasks or afford fiscal backing as well as offer guidance and indulgence that may assist to cope with the strain of widowhood (Cohen, and Wills, 1985). Individuals who receive a higher magnitude of extraversion tend to be sociable, cheery, upbeat, and self-assured, traits that are connected with positively understanding unenthusiastic events and practices (McCrae and Costa 1987; McCrae 1992). Extraverts tend to accept problem-focused rather than emotion-focused coping systems (McCrae and Costa 1986); the former is believed a more effective loom for dealing with sensible or "restoration-oriented" features of beating.

Embracing all these conceptual analyses, the objective of the current project was decided to be:

To locate the division, if there is any, among widower and widow elderlies with regard to their personality dimensions in terms of extraversion and lie score.

Method

Sample

Eighty aged persons (widowers and widows) consisting of forty widowers (n=40, x =53.87 years σ =1.69 years) and forty widows

(n=40, x=53.85 years σ =1.35 years) were selected by purposive sampling technique. The respondents per capita earnings ranged from (Rs 10,000/-13000/ per month), had Hinduism as their creed, were Bengali, were equaled with respect to their diverse ages and sleeted from municipal settings (different areas of Kolkata conurbation). None of the groups on the basis of age was found to be significant.

The contributors were picked on the basis of the subsequent criteria:

Tools Used

a) The Information Schedule :

An information schedule was developed for collecting the basic details of the participants. Information like personal details, occupational history was elicited to be extracted from this schedule.

b) The General Health Questionnaire (GHQ) :

The General Health Questionnaire (Goldberg and Hiller, 1979), is a self-administered screening test aimed at detecting psychiatric disorders among the participants. No time limit is given for completion of this questionnaire and the instruction to complete it precedes the questionnaire. GHQ-28 enclosing 28 items is obtained from factor analysis of GHQ-60 and consists of four subscales; each subscale assesses separate factors like somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression. The scoring procedure of GHQ as mentioned as suggested by Goldberg and William (1988) is 0-0-1-1. Cut-off point for case-recognition was considered as 4/5, i.e. score signifies a non-psychiatric case. Total score ranges from 0-28. In GHQ, correlation co-efficient of each item with total score is significant at 0.01 level. The split-half reliability is 0.97. Its sensitivity and specificity are 1 and 0.88 respectively. In the present work, it is used to rule out the existence of psychiatric morbidity among the participants.

c) Eysenck Personality Questionnaire (EPQ):

The Eysenck Personality Questionnaire (Eysenck and Eysenck, 1975) measures personality dimensions. EPQ assesses three

independent dimensions of personality Psychoticism (P), Extraversion (E) and Neuroticism (N). It also assesses a fourth dimension, namely the Lie (L) factor, which takes care of faking tendency of the subject but which is also an assessment of the personality dimension, namely social conformity. EPQ consists of a hundred and one items, among them twenty-five items assess P, twenty-three items assess N, twenty –items assess E, and twenty–items assess lie scale. In the present work, extraversion has been assessed in order to depict the personality type of the widowers and widows, particularly in dealing with the social situation. Lie score, on the other hand, pinpoints the social desirability of the individuals. It is a self-administering questionnaire and instructions are given at the beginning of the questionnaire. There is no time limit to complete it. Each item is dichotomous and contains either "Yes" or "No" responses. For some of the items, the "Yes" marking represents the '1' score, and for some "No" marking gets '1' score. Total scores are summed.

Extraversion (21)	**No**	22, 30, 46
	Yes	1, 5, 10, 15, 18, 26, 34, 38, 42, 50, 54, 58, 62, 66, 70, 77, 92, 96
Lie Scale	**No**	4, 8, 17, 25, 29, 41, 49, 53, 57, 65, 69, 76, 80, 91, 95
	Yes	13, 21, 37, 61, 87, 99

Reliabilities mostly lie in the .80 to.90 region. Internal consistency reliability for males and females are separately defined. For males, the reliability co-efficient for P is .74, E is .85, N is .84 and L is .81. The reliability co-efficient for P is .68, E is .84, N is .85 and L is .79 are considered for females.

Validity : There are many ways in which a scale such as the P scale can be validated; we have concentrated on two methods. The first of these refers to the examination of criterion groups. The theory fundamental for the edifice of the scales demands that definite groups, e.g. psychotics, should have mainly high scores on the P scale, and it would seem axiomatic that if this were not so, then it could not be

assumed to measure P. The second method of demonstrating the validity of the P scale consists of correlating P scores with variables which according to theory should show positive or negative correlations with questionnaire responses if these were in reality a measure of psychoticism.

Procedure

Rapport was established with the respondents, and then the information schedule, and General Health Questionnaire were administered to rule out the level of psychiatric morbidity among them. Finally Eysenck Personality Questionnaire was administered to assess the amount of extraversion manifested by them. Appropriate statistical tests were used to findout the inter group differences, if any.

Results

The collection of the information has disclosed the foundation of assessment obtained from the psychosocial variable depending on that suitable arithmetical system was employed to scrutinize necessary information to offer the aspire of the present scheme.

Table 1

$\bar{x}$, σ and t values of widower and widow elderly individuals equivalent to extraversion and lie scale

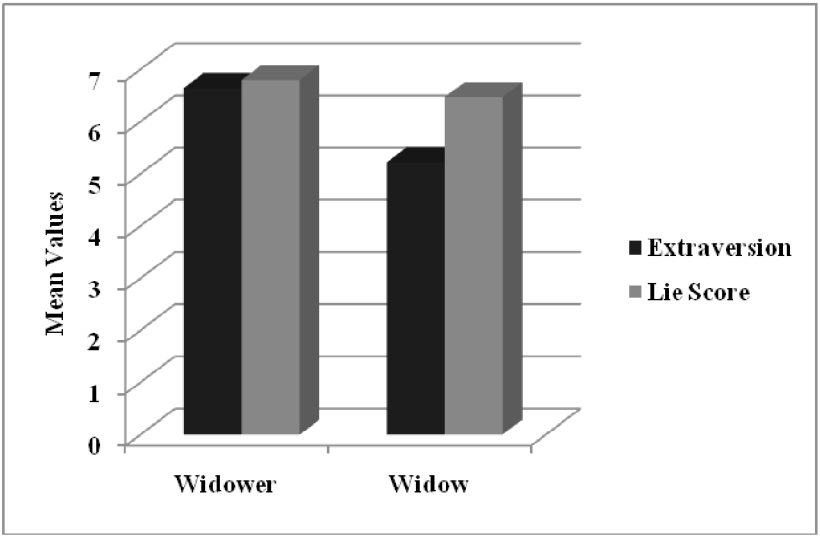
Variable	Widowers (n=40)		Widows (n=40)		t-values (df=78)
Personality Dimension	$\bar{x}$	σ	$\bar{x}$	σ	
Extraversion	6.65	.66	5.22	1.12	6.92**
Lie Scale	6.80	1.01	6.47	.75	.108

***p<0.05 level of significance; **p<0.01 level of significance**

The beyond table set apart significant mean differences between widower and widow elderly individuals with reference to extraversion and lie score of personality dimension. Widowers manifested higher extroversive trends and social desirability than the widow subsample. Though significant inter-group difference is found in the case of extraversion only.

Figure 1

represents graphically the position of each gender namely, widower and widow on the basis of extraversion and lie score



Discussion

In present exploration, significant diversities were derived to ensure the gender difference (i.e. widowers and widows) with respect to extraversion and lie score of personality dimension. Impending logic responsible for such findings are given in the ensuing manner.

Before explaining the tentative judgement of current findings, it is better to understand the basic conceptual analysis given by Eysenck with reference to the description of 'typical' extravert and introvert. In the process of developing of series of questionnaires, he mentioned some character patterns of typical extravert and introvert. The typical extravert is outgoing, akin to parties, has numerous friends, needs to have people to converse with, and does not like appraisal or studying by him. This type of individual desires exhilaration, takes probabilities, acts on the urge of the moment, and is generally an impetuous individual. He is fond of sensible gags, always has a prepared answer, cheery, easy-going, buoyant, and likes to 'laugh and merry'. This type of

person tends to be belligerent and lose their temper rapidly and fails to keep their feelings under taut control and is not always regarded as a steadfast person (Eysenck and Eysenck, 1975).

On the other hand, the typical introvert is a silent, timid sort of person, introspective, and fond of books rather than people, they are reticent and isolated except to intimate friends. They always tend to plan beforehand and disbelieve the whim of the moment. This type of person takes issues of every day with proper seriousness and prefers an organized mode of life. They are able to maintain their feelings under control, seldom behave in an impulsive manner, and proficiently maintain their temper easily. They are regarded as reliable, to some extent pessimistic, and put a great emphasis on ethical standards (Ibid).

In this current search, an attempt was made to find out the difference between widower and widow elderly individuals in terms of the extraversion they exhibited in order to deal with the external reality. Gender difference indicates a significantly higher mean magnitude in the case of widowers ($x=6.65$ and $\sigma=.66$) than widow counterparts ($x=5.22$ and $\sigma=1.12$). Tentative logic reveals the fact that becoming a widow and having non-accessibilityto partner's worshipcrafts a sort of poignant paralysis in their lives (Parsons, 1954; Becker, 1965, 1991). The entire worlds of widowers are also in tenors of gray. They try to begin their expedition in new paths at times (Sinnott, 1977;Gurtmann, 1999;).A positive correlation was found between extraversion with adequacy and satisfaction with social support in the case of elderly male individuals (McCrae, 1985). Widowers actually undergo a conscious process of adaptation in which they have to take on routine responsibilities as a result they get adapted to the social spectrum more easily than widows. Due to flexibility in character patterns, they may be comfortable in mutual interaction and receive maximum support in the time of emergency (Sun, 2002) and exhibit a lack of distortion in relationships.

In widowhood, the process of mourning is long and often a torturous one, where grief returns again and again in cycles, their shock and numbness fade and get replaced by a deep and at times, desperate

awareness of the immensity of their loss (Costello, *et al.*, 2000; Harris, *et al.*, 2008). Gradually though, the reality is transformed into acceptance, yet it leaves greater levels of fatigue, anxiety, lack of interest, and reduced functioning (Van Groenou, 2001; Finley, 2003;Fry, 2003). In the case of widows, whenever they want to enter into a new structure of lives, they receive an immense rejection from the closer ones (Silverman and Cooperband, 1975) as a result prominent tone of depression may come into them, hence higher introvertive trend may be prevalent in them (Eysenck and Eysenck, 1969).

Lie Score

Lie Score basically indicates the level of social desirability which is required for every individual in order to maintain their social image. In this present exploration basically, no difference was found between widower and widow elderly individuals with respect to lie score. In widowhood, after loss emotional trauma seems to be near its peak after separation, and in order to get social and mental support from others both widower and widow elderly individuals try to maintain a balance between their inner needs and outer manifestations (Hud, 1999). A slightly higher numerical trend on the part of widowers ($x=6.80$ and $\sigma=1.01$) reveals the fact that they try to rediscover or reconnect their identity and find their way beyond their grief (Ibid) to some extent better way than widow counterparts ($x=6.47$ and $\sigma=.75$).

Conclusion

- Current investigation reveals that widowers are more extravert than their female subsample. Ability to commence their new conduits after slaughter in a different way actually facilitates them to fiddle with to some extent better ways than widows. Immense rejection from the closer ones may invite a depressive tone within widows and position them at the lowest point of this dimension of personality.
- Considering social desirability both samples are positioned more or less at a similar point because in order to deal with

the veracity after their loss they have to expand the balance between their inner needs and outer appearances which actually mould their personality pattern.

Limitations of the Study

Research in any gamut can't be unshackled from inaccuracies

- Avoidance of the rustic population deter the study from making better oversimplification
- Insertion of more samples belonging to diverse marital statuses brings a more precious picture of this present venture of aged inhabitants
- Assemblage of another psychosocial variable would be more advantageous for drawing the entire picture of this venture
- Larger sample size also helps in making better generalizations for this study

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Mental Health Profile of Elderly of Uttarakhand : Analysis across Their Educational Level and Financial Status

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ABSTRACT

The present study was undertaken to analyze the mental health of the elderly, that is, stress, anxiety, and depression across their educational qualification and financial status. 200 elderly (n=200) were randomly selected from two representative populations, that is, institutionalized elderly (n=100) drawn from the SRA (Society Registration Act) recognized old age homes of Uttarakhand and non-institutionalized elderly (n=100). Self-Structured Performa was used to assess the socio-demographic and socio-economic status of the respondents. The mental health of sampled elderly was assessed using the Anxiety, Depression, and Stress Scale (Megha Singh, and Pallavi Bhatnagar, 2016). Analysis across educational status revealed that elderly who were

illiterate or educated up to primary or high school/ intermediate exhibited significantly higher levels of stress, anxiety, and depression in comparison to those who were educated up to graduation or above, irrespective of their being institutionalized or non-institutionalized. Perusal across financial status indicated that regardless of their residential status, elderly who had no income exhibited higher levels of stress, anxiety, and depression in comparison to elderly having income from any source. Thus, it is of particular relevance in terms of policy planning to identify population characteristics that influence the need for interventions to prevent stress, anxiety, and depression in the elderly in institutional care and to schematize social and health-care services.

Keywords : Ageing, Depression, Education, Institutional care, Income

Stress is an inevitable thread in the fabric of life. Just like ripping off one thread can dismantle the whole fabric, trials to avoid adversities can create make us even more vulnerable to psychological distress and hamper our mental health at a later age. Stress is simply the body's response to changes that can be physically or emotionally taxing. It can be positive (eustress) or negative (distress) when seen in the context of its consequences. Eustress motivates us and helps us focus our energy on improving our performance, while distress makes us anxious and lowers our spirits. Every individual has a different tolerance level and means of handling pressure. Some individuals give in to stressful situations which leads to anxiety and later depression in life. Anxiety is a feeling of uneasiness or worry about anything regarding uncertainty in its outcome.Depression is a mental health disorder characterized by persistent low spirits and loss of zeal and motivation. An individual who can cope with stressors in life and

develop his/her potential through them can be termed mentally healthy. It is a state of well-being where along with individual development, an individual can make active and fruitful contributions to society. With increasing age, an individual tends to have diminishing resilience to anxiety, decision-making ability, concentration, and restorative sleep as opposed to when he/she is young. This may lead to exaggerated worries in any circumstance in life. Moreover, the elderly people are gradually incapacitated by reduced functioning of vitals, endurance, strength, and other age-related medical conditions, physiological and psychological changes which altogether make it even more challenging for them to recover and pave the way for stress, anxiety and ultimately depression

Symptoms of stress, anxiety, and depression may manifest differently in the elderly because stress does not affect the young and old alike. This makes it less likely to detect depression in the elderly because the symptoms may vary with age. Depressive symptoms at a young age may involve difficulty in forming and maintaining social relationships, feelings of worthlessness, and self-loathing. Whereas in old age, these may manifest as loss in appetite and weight, disrupted sleeping patterns and so on which are usually associated with medical problems rather than being seen as deficits in mental health. The elderly may not realize that they are depressed because they may feel that they are feeling low because of medical conditions associated with old age and not accept their condition because of the social stigma associated with it. Retirement from work can bring along with it the loss of a sense of self-worth and self-identity. The elderly tend to lose a sense of purpose in life. Financial constraints also lead to a change in lifestyle which encompasses changes in both physical as well as emotional domains for the elderly. They become more passive, less vibrant, and engage less in activities that can help in venting out their stress. Volunteering in social work for the less privileged can help broaden their outlook on life and serve as a medium for acknowledging emotional changes and also being grateful for what they have. Such activities can be cathartic on many different

levels. Social engagements may also prove to be instrumental in strengthening their social network or social support system. Sudha, *et al*., (2006) reported that it is more productive in terms of health if one bond strongly and engage constantly with a neighbour or child than having numerous weaker relationships with various members of the family and society.

Family serves as a support system by providing nursing care, emotional support, a sense of belonging, and meaning to life for the elderly. A family is a group of individuals playing the role of being an important source of communal ties and communal influence for individuals during their life course (Umberson, *et al.,* 2010). Family provides endurance for dealing with not-so-pleasant situations in life and moderates the stress or anxiety experienced. In India, traditional ancient culture with joint families by no means posed complexities for elderly care. With the advent of modernization, family structures are rapidly changing and the role of family members as principal caregivers for the elderly is declining. There is a gradual erosion of the tradition of family support in India. According to Kumar, *et al.,* (2011), the emerging prevalence of nuclear family set-ups in recent years is more likely to expose the elderly to emotional, physical,and financial insecurity in the years to come. The absence of apt physical, financial, and psychological conditions, such as;inefficient housing structure, migration of youth for employment opportunities, financial crisis, and the change in family structure have altogether made the elderly more vulnerable to stress, anxiety, and depression.

In India, incidences of financial deprivation, material exploitation, property snatching, desertion, verbal humiliation, and emotional and psychological distress lead to poorer mental and physical health consequences in the elderly (Shankardass, 2009). According to Mane (2016), background characteristics such as age, socio-economic status, health, residential status, and others significantly influencethe needs and problems of the aged. Socio-economic status viz., education, occupation, income, and socio-demographic factors viz., age, gender, and so on are the decisive

factors that govern an individual's employment, resource distribution, social support, medical care, and so on. According to Castro-Costa, *et al.*, (2008), demographic and societal characteristics, such as gender, marital status, age range, educational level, and economic class are often related to depression in the aged. Findings of a study conducted in Hyderabad by Sudhir, and Pappathi, (2005) revealed that stress was highest in women because of the death of a spouse, gender roles, and poor health status. In their study, Kim *et al.*, (2012) reported that the elderly are more likely to have suicidal ideas when they have a low educational level and financial status.With the increase in the educational level, psychological resilience and coping mechanisms (Christensen, *et al.*, 2006) and social relationships (Lasheras, *et al.*, 2001) improve. Evidence from a study by Van Oort, *et al.*, (2004) suggests that healthy behaviours are probably exhibited more by individuals with higher educational level as opposed to the ones with a lower level of education which help in improving their physical health.The elderly with low financial status may be less likely to have well-furnished and equipped housing arrangements that may assist them in effectively dealing with their functional deficits. Individuals with low educational levels and economic status have restricted access to healthcare services and rehabilitation programs.Low SES is also likely to be associated with persistent psychological stress and lack of societal support which prove to be significant barriers to improving physical ability (Adler, 2002).

The studies quoted above establish that socio-economic factors play a significant role in governing the availability of resources and opportunities to individuals and prove to be consistent predictors of a vast array of outcomes across the lifespan, including physical and mentalwell-being. There have not been many studies in India, and in Uttarakhand in particular, on how the mental health of the elderly is affected by dominating individual factors like educational level and financial status.Thus, the proposed study has been taken up with the purpose of enhancing our knowledge about interacting forces that

shape an individual's mental well-being and promote mental health in old age.

Objectives:

1. To study stress, anxiety, and depression among the elderly across their educational level
2. To assess stress, anxiety, and depression among the elderly across their financial status

METHOD

Sample

Uttarakhand state was purposively selected as the locale because it is the mandate of G.B. Pant University of Agriculture and Technology to carry out research and extension activities for state welfare. In Uttarakhand, out of the total old age homes registered under the Society's Registration Act, directors of only five old age homes granted permission to conduct the study, and thus these old age homes served as a research base for the present study.

The sample for the present study comprised two groups of elderly population viz., institutionalized elderly who were drawn from the SRA recognized old age homes in Uttarakhand through complete enumeration method (n_1=100) andnon-institutionalized elderly (n_2=100) who were drawn randomly from the neighbouring localities of the old age homes. Thus,the total population of the elderly for the present study comprised 200 respondents.

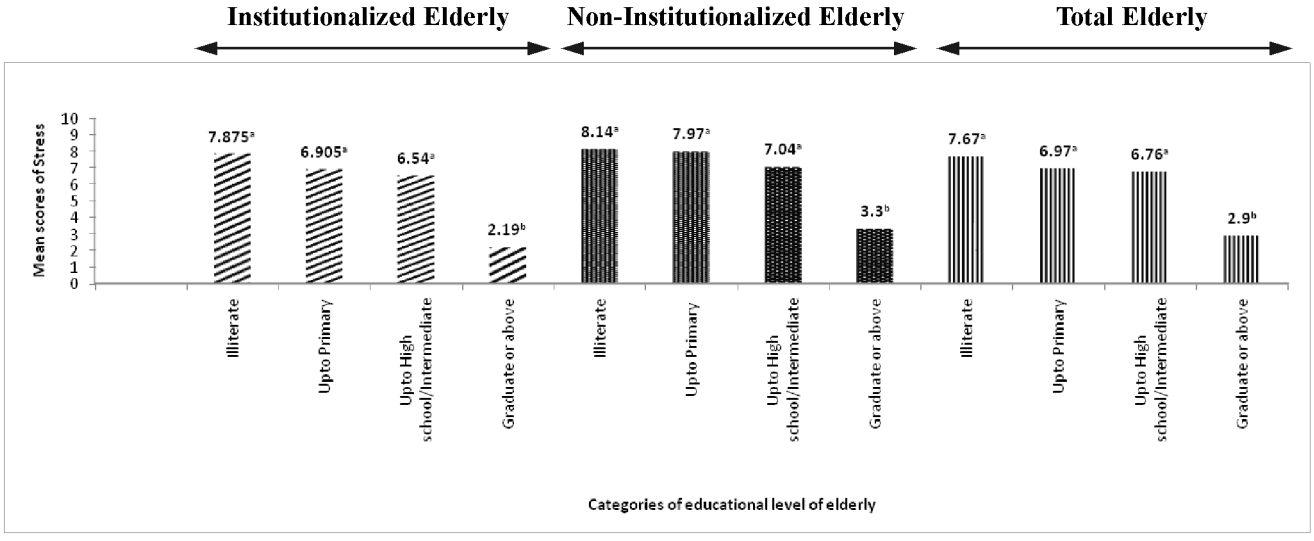
Tools for data collection

The mental health of the elderly was assessed by employing the Anxiety, depression, and Stress Scale by Megha Singh, and Pallavi Bhatnagar (2016). The scale comprises 48 items divided into 3 subscales - The anxiety subscale-comprises 19 items indicating various symptoms that display clear expressions of anxiety. Depression subscale-It consists of 15 items signifying the different signs of depression.Stress subscale-It is a scale containing 14 items displaying the symptoms that manifest when one experiences stress.

Data Collection and Analysis

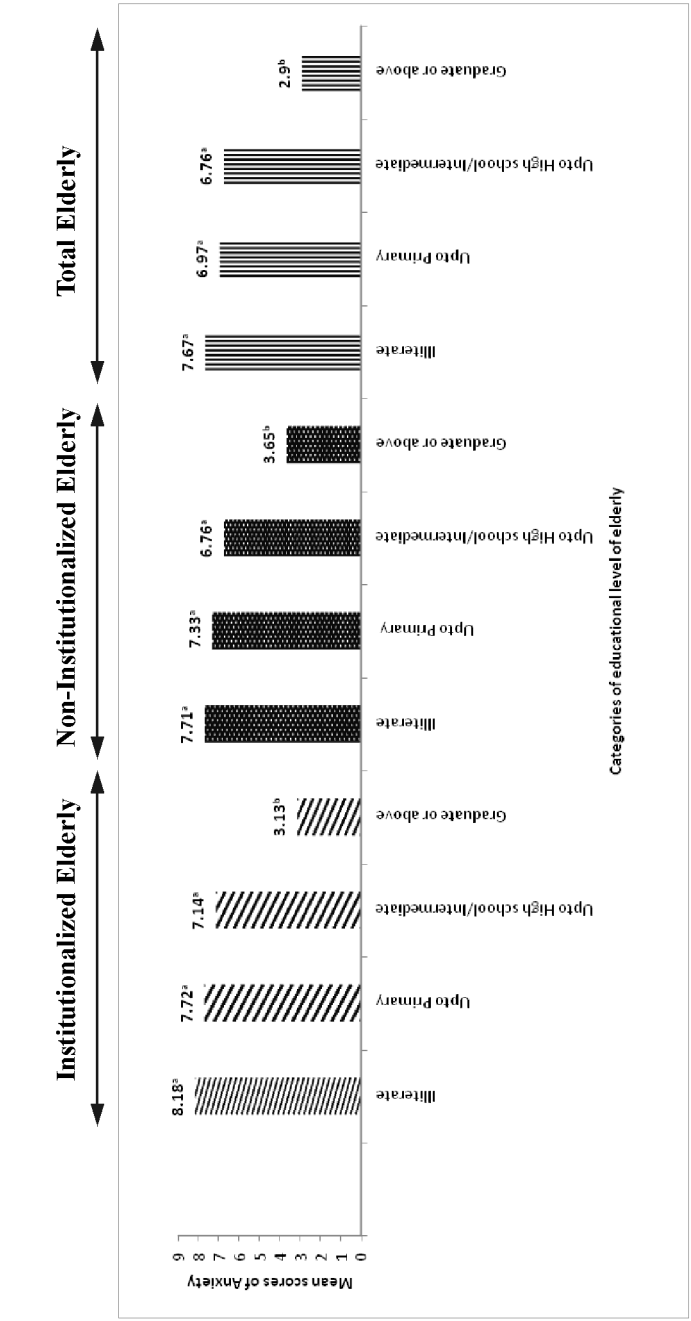
The investigator approached the Directors of the concerned institutions and briefly clarified the purpose of the study. After receiving permission from the respective directors, the researchers approached and engaged directly in conversation with the respondents. A Hindi version of the scale was used. Respondents were given questionnaires for a limited amount of time and were asked to fill them under the strict supervision of the researcher.The interview method was employed for the respondents who were illiterate. Along with that, participatory observations were made to gain insights into their stressful life experiences and coping mechanisms. The collected data was analyzed by classifying and tabulating it in accordance with the objectives to arrive at meaningful conclusions. Univariate analysis was employed to assess the respondents' characteristics. The study hypothesis was tested using the mental health of the elderly as the dependent variable and their educational level and financial status as independent variables. The other statistical techniques used were frequency, percentage, mean, standard deviation, and z-test.

Results and discussion



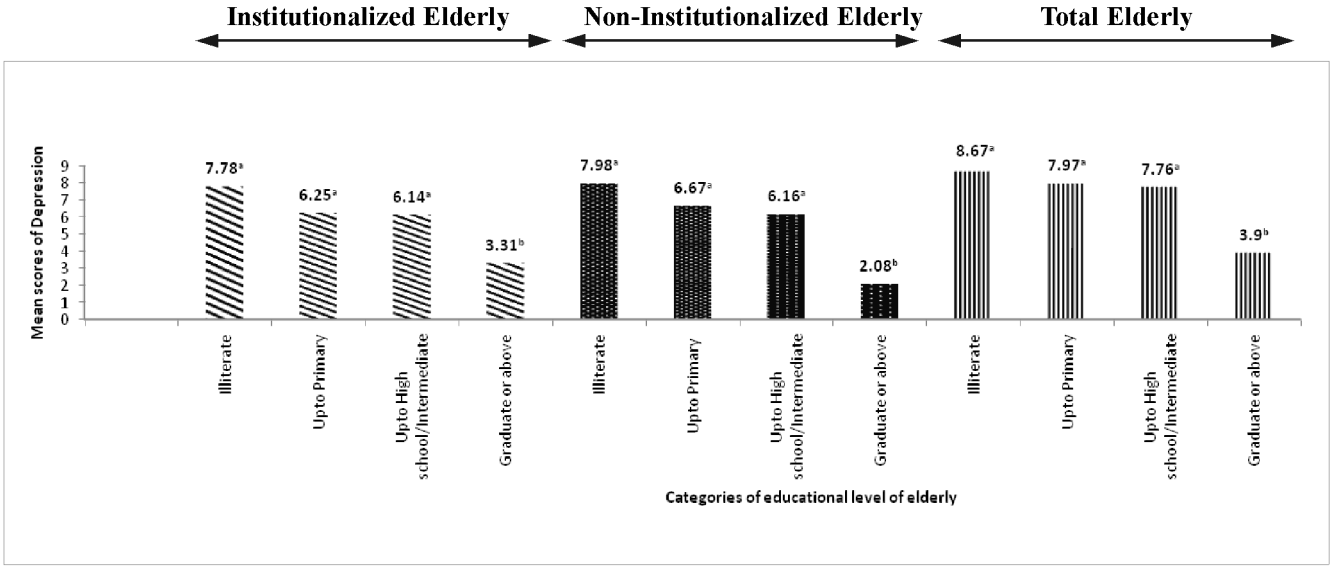
Note: Means with different superscripts are significant at $p<0.05$ for each group of the elderly population

Fig1 (a): Mean scores of stress among elderly across their educational level



Note: Means with different superscripts are significant at $p<0.05$ for each group of elderly population

Fig1 (b): Mean scoresof anxiety among elderly across their educational level



Note: Means with different superscripts are significant at $p<0.05$ for each group of the elderly population

Fig1 (c): Mean scoresofdepression among elderly across their educational level

A close perusal of Fig 1 (a), (b), (c) clearly depicts that elderly who were illiterate or educated upto primary or highschool/ intermediate exhibited significantly higher levels of stress, anxiety, and depression in comparison to those who were educated upto graduation or above, irrespective of their being institutionalized or non-institutionalized. The possible explanation for this might be that higher education enables an individual to have an optimistic view of the stressors in life and turn them into opportunities to develop capabilities that make them become a better version of themselves. Educated individuals, who are not able to cope with stress on their own understand reaching out to psychologists and learning about positive ways such as going for walks or engaging in other recreational activities as surrogates to metabolize the stress hormones. Ross and Zhang (2008)in their study established that higher educated elderly exhibited lower levels of stress as opposed to the elderly with comparatively lower education because education enables individuals to engage in activities that are physically and cognitively stimulating.

Education is a core indicator of the socioeconomic status of an individual and has a high significance in determining prospects of life including employment. Educational qualifications of an individual can moderate the effects of stressors since highly educated individuals have a better chance of ultimately landing jobs with healthier salaries and thus eventually being more stable throughout the life course. Whereas, the effect of everyday stressors is much more devastating for less educated individuals because they are less advantaged, and consistent financial hardships make it even more difficult for them to deal with stress positively. Also, individuals with lower educational qualifications are less likely to conceptualize the idea of stress, anxiety, and depression positively because of fear of being stigmatized or labeled as "insane". Mroczek and Almeida (2004) in their study suggested a stronger association between daily stress and negative affect for older as compared to younger adults. A similar picture was seen in the levels of anxiety among the elderly where anxiety was found to be highest in the elderly who were less educated. The elderly

with lower educational level are more likely to depend on their family members and relatives for managing chores such as; consultation with doctors, filling out forms (especially in English), managing their finances, and so on. Education provides a sense of mastery and self-efficacy which in turn help people deal with stress effectively. If there is a lack of availability in physical, emotional, and spiritual care for the elderly, as is the case in the nuclear family setup, it would heighten the anxiety levels in the aged.

The findings of the study by Gautam,*et al.,* (2013) revealed that anxiety was significantly correlated with depression and alienation and negatively correlated with expression (sub-component of mental health status). In the present study, depression levels were found to be significantly higher in less educated elderly as opposed to their counterparts who are comparatively highly educated. A study by Taqui,*et al.,* (2007) reported that low educational level is directly associated with levels of depression in the aged. According to Erikson's theory of psychosocial development, age above 60 is a stage of conflict between two perspectives viz., ego integrity and despair where the elderly look back into their life and retrospect if they have lived a productive and fulfilling life or not. Less educated individuals are more likely to lack the perspective of looking back on their life with a sense of closure and completeness. Disparities in terms of resources, employment, income, and so on are compounded as the effect of low education becomes even more consequential with age. Individuals with low educational qualifications might lag behind probably due to a lack of cognitive functioning, engagement in religious or recreational activities, and other protective factors that help lower the effect of risk factors and reduce psychological vulnerability in old age. Individuals from disadvantaged backgrounds may have less social support to draw upon for smooth sailing in tough times. Whereas, higher-educated individuals contemplate their achievements and develop the virtue of wisdom which leads to a greater sense of self-worth in old age. According to a study by Jose (2009) acceptance of death, a sense of value and meaning for life,

and ego integrity increase with the level of educational achievement in the elderly. Better education compensates for the preexisting disadvantages due to low financial status and career opportunities. In India, the traditional family structure reinforces the higher status of senior citizens in both family and society. Educated elderly can adequately suit the role of being "wardens of culture" protecting and sustaining the culture and values by transmitting the knowledge, skills, and experiences and integrating the generations together.

Figure 2: Mean scores of stress, anxiety and depression among elderly across their financial status

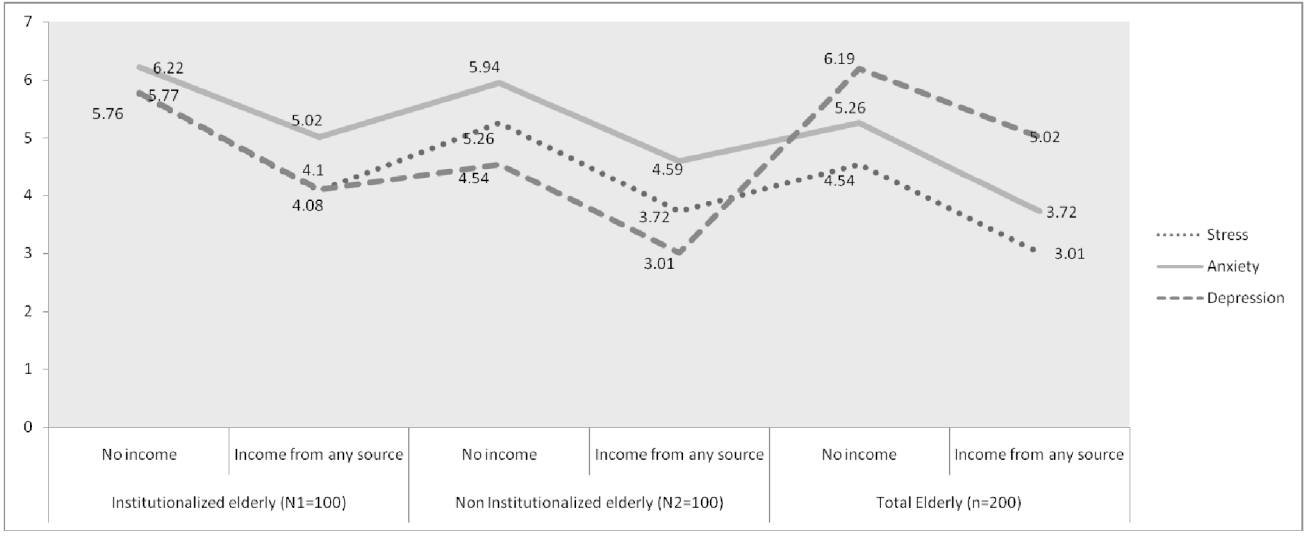


Figure 2 depicts the level of stress among the elderly across their financial status. It can be seen clearly that the elderly who did not have any source of income reported significantly higher stress as compared to the elderly having income from any source like pension, house/shop rent, part-time job, interest from deposited funds, etc. This finding is in line with the study conducted by Agrawal *et al.*, (2002) who reported that elderly belonging to low per capita income experienced more traumatic life events than the ones belonging to a high per capita income. It may be because of the financial independence and stability that respondents have, they take their own decisions, won't neglect their health check-ups, and can afford their daily expenses. A similar picture was seen in the anxiety levels of the elderly where the elderly who did not have any sources of income reported higher levels of anxiety as compared to the elderly having income from any source. Probable reasons could be that financial distress disturbs the satisfaction of the elderly and incapacitates the elderly to make decisions and plan their lives accordingly, thus elevating anxiety levels. On the other hand, the elderly who have a regular source of income plan their retirement, and are more independent in taking their decisions are less higher levels of anxiety. The overall analysis of the levels of depression in the elderly shows that the elderly with no income were found to have significantly higher levels of depression as compared to the elderly having income from any source. This finding is in line with Lee and Kim (2005) who reported that low income in the elderly affected their depression levels in them. The probable reason behind it could be diminishing financial independence that compromises autonomy in decision-making. According to Pinxten and Lievens (2014), income is associated with health outcomes because of the material and resources it provides. The elderly having lower financial status cannot afford age-friendly residence modifications, assisted living facilities, and so on.

Individuals who are in the formal sector have the benefit of availing of insurance and pension schemes in old age. Whereas, individuals who are engaged in casual labour or are self-employed

are not entitled to retirement benefits. This is because most of the time during jobs, they are struggling to make ends meet, pay bills, and manage daily chores which leaves them with very little or no money for savings for the future. Inadequacies in receiving pension benefits further pose financial stress in old age. Lower socioeconomic status (SES) is associated with increased felt age (Barrett, 2003). The probable reason for this might be that stress takes a great toll on the health of individuals and that can accelerate the process of ageing. Moreover, they are likely to have little voice in public policy decisions which further aggravates their stress and makes them more anxious. According to Johnson *et al.*,(1999), low family SES was associated with a risk for offspring anxiety, depression, disruptive, and personality disorders. It means that individuals with low financial status encounter undue psychological stress and comparatively fewer rewards resulting in mental distress. Communities with people having lower educational levels and financial status are more prone to having adverse life circumstances often associated with higher crime rates, low quality of medical care, and so on. The high financial status allows affordability, access, and efficient use of communal and individual resources. It means the educational level and financial status of an individual have the power of moderating the effects of adverse circumstances in life.

Conclusion

With the world's elderly population continuously growing at an unprecedented rate, it is becoming increasingly difficult and challenging to cater to their needs. As we have outlined, financial and social security is essential for ensuring both physiological and mental well-being in old age. India, being a developing country, faces enormous challenges in bridging the gap in equitable access to age-specific healthcare services, for the elderly, which further compounds stress, anxiety, and depression in them. Low educational level affects the individual's employment status, which in turn affects overall income and limits access to resources. There is a strong need to sensitize and orient people regarding the need for special care and attention

in old age. Provisions for recreation centers, and community and activity centers by the government can serve therapeutic purposes along with social networking benefits for the elderly. It is also essential for the government to find the right balance between providing benefits through schemes and making certain of their sustainability in the long term. This will aid in reducing the risk of mental disorders associated with social inequalities.

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Nutritional and Health-related Survey of Elderly People Living in Sub-urban Areas of Kolkata

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ABSTRACT

150 elderly persons comprising 70 males and 80 females, ages varying from 65 years to 75 years, living in the sub-urban areas of Kolkata were selected randomly. A pre-tested questionnaire containing questions related to an anthropometric assessment, major health-related issues, and a mini-nutritional assessment was administered individually. The major findings revealed that these elderly, despite being educated and having some or other sources of income, are not much conscious about their health. They have a high risk of malnutrition and hypertension which is statistically significant.

Keywords: Malnutrition, Socio-demographic, Health status, Anthropometric data

Physiological and psycho-social changes during ageing make it difficult to meet the nutritional needs of the elderly. Physiological changes such as diminished taste and smell, xerostomia, sarcopenia, and malabsorption of various essential nutrients lead to reduced food intake and there is an overall reduction in basal metabolic

rate.Deficiencies of micronutrients especially shortfalls in intakes of vitamin C, calcium, vitamin D, folate, zinc, and magnesium were evident in most of the studies.

Psycho-social factors such as bereavement, illness, disability, and social isolation can influence dietary practices. Older people are vulnerable to malnutrition which is associated with an increased risk of morbidity and mortality (Margetts, *et al.,* 2003).Increased falls, vulnerability to infection, loss of energy and mobility, poor wound healing, and confusion are reported consequences of undernutrition (Kenkmann, *et al.,* 2010). Social deprivation is one of many factors likely to contribute to this. Those with low incomes are known to have a poorer diet than the more affluent and are often patients at risk of malnutrition on admission to the hospital. Whilst undernutrition may be considered a greater risk to health in older people; obesity also increases morbidity and mortality from diabetes, hypertension, and cardiovascular disease. The prevalence of overweight and obesity continues to rise amongst the population as a whole, and current evidence indicates that the prevalence in those aged 65+ is increasing.

Thus, meeting the diet and nutritional needs of elderly people is of utmost importance and is crucial for the maintenance of health, quality of life, and functional independence.

Objectives of the study

As more individuals are able to achieve old age, they enter a period of increased susceptibility to age-related chronic diseases, particularly cardiovascular diseases, cancer, and diabetes mellitus. Moreover, India's demographic changes bring massive challenges of a growing burden of an increasingly female older adult population and their income security. This study will present an overview to develop a strategy that will address problems with the following objectives:

1. To study the socio-demographic profile of the elderly population.
2. To find out the major health-related issues prevalent in the elderly population.

3. To assess the nutritional aspect of the elderly people using MNA

METHOD

Sample

A sample size of 150 subjects comprising both males (N=70) and females (N=80), ages varying from 65 years to 75 years, staying in sub-urban areas of Kolkata (district South 24 Parganas) were selected randomly in this study.

The socio-demographic data of the elderly in this study revealed that 81.42 percent of males and 80 percent of females were married. 71.42 percent of males and 66.25 percent of females were having education equivalent to graduation or above. 38.57 percent of males were retired from a government job and were receiving a pension and 43.75 percent of females were homemakers. 52.2 percent of females were dependent on their family members for their expenses.

Tool used

A pre-tested questionnaire was administered to collect the following information:

(a) Socio-demographic profile includes information like age, marital status, education, income source, addiction, aversions, type of family, living arrangements, social aspects, etc.

(b) Nutritional anthropometric data such as height, weight, and BMI were collected

(c) Common ailments present in elderly people, and

(d) Validated **Mini Nutritional Assessment Tool** (Rolland, *et al.*, 2012), for identifying malnutrition among the elderly.

Data obtained were analyzed qualitatively and quantitatively. SPSS software package was used for the purpose of statistical analysis. The study was limited to the urban and rural areas of south 24 Parganas and Kolkata, West Bengal

Results, and Discussion

Table 1

Anthropometric data

Parameters	MALES n= 70 (Mean ± SD)	FEMALES n=80 (Mean ± SD)	t-value	P-value	Significance ($p < .05$)
Age (years)	69.24 ± 2.13	67.89 ± 1.63	4.3882	<.0001	S
Height(cm)	176.40± 3.65	161.55± 5.37	19.5213	<.0001	S
Weight(cm)	59± 3.11	50± 5.9	11.4440	<.0001	S
BMI (kg/m^2)	19±2.55	19.3±1.30	0.9242	.3569	NS

The above table represents the anthropometric results of the elderly.The mean age of males and females are 69 and 67 years respectively and there was a significant difference (<0.0001) between the age of the two groups.

The mean height and weight of males were 176.40 cm and 59 kg whereas the mean height of females was 161.55 cm and weight was 50 kg. Both height and weight of the males and females were statistically significant but there was no significant difference between their BMI.

Table 2

Common Ailments and Diseases of the Elderly

Ailments	MALES n= 70	FEMALES n=80	Chi-square Value	P value	Significance ($p< 05$)
Visual Impairment	64	68	1.461	.226	NS
Low Back Pain	56	63	0.035	.850	NS
Hypertension	58	47	10.33	.001	S
Osteoarthritis	54	62	0.0027	.958	NS
Diabetes Mellitus	42	39	1.902	.167	NS
Hearing loss	23	19	0.544	.460	NS

Significant (S); Not Significant (NS)

The table represents the common ailments of both elderly males and females. The major diseases or co-morbidities present in order of prevalence in males were: Visual Impairment, hypertension, low back

pain, and osteoarthritis followed by diabetes, and hearing loss respectively. The result is nearly the same for females with Visual Impairment, low back pain, osteoarthritis, hypertension and diabetes, and hearing loss. The disease level of the two groups has no significant difference between them, in other words, both groups have more or less the same problems except for hypertension which was significant ($p<.05$)

Table 3

Mini Nutritional Assessment (MNA)

	MNA Scores = 24 Adequate nutrition	MNA Scores 17-23.5 Risk of malnutrition	MNA Scores <17 Malnutrition	Chi-square Value	P value	Significance ($p<.05$)
Males (n=70)	2	54	14	12.578	<.001	S
Females (n=80)	1	41	38			

The mini nutritional assessment tool (Guigoz, *et al.*, 996; NNI, 2009) comprises two well-validated combinations for the assessment of the elderly. It has two parts -screening and assessment. The screening part has six questions (A-F) where the maximum score is 14. If the points are >12,there is no need to proceed to the next part of the assessment and it should be assumed that the person is normal but if the point is below 11 there is the possibility of malnutrition, and the person should be assessed using the 12 assessment questions (G-R) where the maximum score is 16. Thus, the full Mini Nutritional Assessment comprises of 18 questions with maximum marks of 30.

Scores $\geq$ 24 show adequate nutrition, scores between 17-23.5 show the risk of malnutrition, and scores below 17 show malnutrition. Table 4 shows the maximum frequency among males and females in the risk category where the score is between 17-23.5 and was found significant ($p<.05$)

India thus acquired the label of **"An Aging Nation"** with 7.7 percent of its population more than 60 years old. In India, elderly people suffer from both communicable as well as non-communicable diseases. A decline in immunity, as well as age-related physiologic

changes, leads to an increased burden of communicable diseases. ICMR reported on the chronic morbidity profile in the elderly, states that hearing impairment is the most common morbidity followed by vision impairment. Studies in developing countries show that multiple chronic illnesses, nutritional deficiency, and functional disability are common features of old age that can cause malnutrition also (Rolland, *et al.*, 2012). There are a number of conditions frequently associated with age (i.e., arthritis, limited vision and hearing, and depression) that potentially create risk factors for the elderly. Nonetheless, these elderly were found unwilling to recognize or accept their physical limitations (Singh, and Shrestha, 2016). Weakness of the eye is an eminent problem for the elderly. Arthritis and diabetes are also found to be highly prevalent diseases in older age. The greatest causes of disability in old age worldwide are estimated to be sensory impairments, such as hearing and vision loss, back and neck pain, chronic obstructive pulmonary disease, depressive disorders, falls, diabetes, dementia, and osteoarthritis. According to the National Health and Nutritional Survey, National Health Interview and the Compressed Mortality File Hypertension is the most prevalent condition among older adults, affecting 71 percent of the population. Women are more likely to have hypertension than men (77% vs. 58%) arthritis is the third most prevalent condition among older adults, affecting 60 percent of older women and 42 percent of older men. The Indian elderly are more likely to suffer from chronic than acute illness. There is a rise in NCDs, particularly cardiovascular, metabolic, and degenerative disorders, as well as communicable diseases. Inadequate diet and malnutrition are associated with a decline in functional status, impaired muscle function, decreased bone mass, immune dysfunction, anemia, reduced cognitive function, and poor wound healing (Shrestha, 2000; Kosuke, and Samir 2004; Alam, 2006; Ingle,and Nath, 2008).

Conclusion

It can be concluded that the elderly in this study, despite being educated and having some or other sources of income, were not much conscious about their health. They thought of it as a common

phenomenon and were not eager to improve their health conditions by incorporating changes in their lifestyle. They have a high occurrence of malnutrition and hypertension. Visual Impairment, low back pain, osteoarthritis, diabetes, and hearing loss are also common. The health care services should be based on the "felt needs" of the elderly population. Felt needs may vary depending upon gender,and socio-economic status, as well as differences that would exist in the rural and urban areas but the concern about their well-being is our priority.

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Spirituality as a Mediating Factor of Mental Health of the Elderly : A Review

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ABSTRACT

The purpose of this review paper was to understand the relationship between spirituality,and mental health, and the role played by spiritual practices in enhancing the mental health of elderly people. For this purpose, 24 studies, related to the subject, published in various journals were systematically reviewed for better understanding and analysing a multitude of factors with the aim of alleviating the suffering of elderly people.The reviewed literature revealed that people who practiced spirituality live a more productive life and they also age more efficiently. They are inclined towards spirituality and religion which help them cope with the changing life dynamics.

Keywords: Ageing, Elderly, Mental health, Religion, Spirituality.

Mental health issues among the elderly are becoming more prevalent every day. In the United States, the suicide rate among people aged 65 and above is more than in any other age group

(Coren & Hewitt, 1999), and mental health is shown to be closely linked to the ageing process in older people (Mirowsky, and Reynolds, 2000). India traditionally adopted joint family systems in which everyone shared responsibilities, financial rewards, social considerations, and so on, and seniors were honoured by all family members (Tiwari, and Pandey, 2012). However, with modernization and the rise of nuclear families, there is a gradual weakening of traditional living patterns. The health and care of older adults, as well as the growth of health care services for them, are being negatively affected by demographic and socioeconomic changes.

Spirituality is a mediating factor for mental health of elderly. A recent systematic review based on Meta-analysis on the relationship between spirituality and depressive symptoms analysed the findings of 147 independent studies involving a total of 98,975 subjects, and it was moderately found that the spirituality is significantly associated with a reduced level of depressive symptoms (Smith, *et al.*, 2004). Spirituality also appears to have a higher protective effect for those who are facing psychosocial stress.

People often turn to spirituality as a way to face or deal with their grief (Rosenstiel and Keefe, 1983; Keefe, and Dolan, 1986; Ashby, and Lenhart, 1994; Keefe, *et al.*, 1997). Spirituality is said to provide wisdom to an individual that he or she can adopt throughout their lives. It also keeps a person's negative thoughts away (Suhail, and Chaudhry, 2004). Many studies have found that spirituality is associated with feelings of fulfilment, contentment, and high morale. It is thought to have a protective effect against a variety of mental illnesses (Cohen, and Koenig, 2004). Spirituality has also been recognised as a resilient effect on an individual's rationality and reactions, as well as playing a critical role in healing and moulding an individual's personality to their surroundings (O'Neill, and Kenny,1998). Spirituality motivates people to engage in positive habits and routines (Hadzic, 2011). It

enables a person to handle life's harsh facts and issues in a calm and sensible manner. It is thought to be a complicated and intimate part of human upliftment in which an individual gradually moves to a better domain of well-being, realisations that aid in recognising one's identity or purpose of existence (Derezotes, 1995). It refers to a set of positive traits and beliefs that bring calm and knowledge into one's life while keeping one away from rigid and ludicrous religious activities (Wulff, 1996).

Keeping in view all these studies the authors decided to analyse 24 studies related to spirituality and mental health in the elderly conducted in various countries that were reviewed in this paper. For details of these studies see the table given below :

Table 1. *Details of Studies reviwed in the paper*

S. No.	Author and Year	Title	names of Journals	Study Design	Study subject	Sample size (n)	Screening Tools
1.	Amir, *et al.*, (2021)	Impact of Religious Activities on Quality of Life and Cognitive Function Among Elderly	*Journal of Religion And Health*	Cross-sectional Study	60 years or above	432	Malay version of Short Form (36) Health Survey (SF-36), Geriatric Depression Scale (GDS-15), Older Americans Resources and Services's Instrumental Activities of Daily Living (OARS's IADL), and the Montreal Cognitive Assessment (MoCA) questionnaire
2.	Vaigankar, *et al.*,(2021)	Religious Affiliation in Relation to Positive Mental Health and Mental Disorders in a Multi-Ethnic Asian Population	*International Journal of Environmental Research And Public Health*	Cross-sectional survey	Above 65 years	2270	Self-administered Positive Mental Health instrument interview
3.	Papathanasiou, *et al.*, (2020)	The Effect of Spirituality on Mental Health Among Hypertensive Elderly People: A Cross-sectional Community-based Study	*Materia Socio-Medica*	Descriptive, Cross-sectional Study	65 years and above	134	FACIT-Sp-12 scale, GHQ-28
4.	Lima, *et al.*, (2020)	Spirituality and quality of life in older adults: a path analysis model	*BMC Geriatrics*	Cross-sectional Study		604	The Barthel Index, The Spiritual and Religious Attitudes in Dealing with Illness, Satisfaction with Social Support Scale, Short Form Health Survey

5.	Villani, *et al.*,(2019)	The role of spirituality and religiosity in Subjective Well-Being of Individuals with different religious status	*Frontiers in Psychology*	Online Survey	18-77 years	267	Spirituality Assessment Scale, U-MICS, SWLS, PANAS
6.	Singh & Bisht (2019)	Spiritual and Psychological Well-Being of Elderly	*Current Journal of Applied Science and Technology*	Comparative Study	Above 65 years	200	The Spiritual Belief Scale (SBS), Psychological Well-Being Scale
7.	Kumari & Sharma (2018)	Spirituality: A tool for learning, change and adaptation of elderly in changing Indian family	*International Journal of Learning and Change*	Case Study Design	60 years and above older adults	20	Self-constructed questionnaire, observation and semi-structured interviews
8.	Malone & Dadswell (2018)	The Role of Religion, Spirituality and/or Belief in Positive Ageing for Older Adults	*Geriatrics (Basel, Switzerland)*	Qualitative Study	63-92 years	14	Self-made semi-structured interview schedule
9.	Scortegagna, *et al.*, (2018)	The experience of spirituality among institutionalized elderly people	*RevistaBrasileira de Geriatria e Gerontologia*	Exploratory and Descriptive	60 years or older	30	Semi-structured questionnaire
10.	Vitorino, *et al.*, (2018)	The association between spirituality and religiousness and mental health	*Sci Rep 8*	Cross-sectional Study	18-60 years	1046	WHOQOL-BREF, PHQ-9, GAD-7 LOT Revised, DUKE Religion (DUREL) Index, FACIT-SP12
11.	Saleem & Khan (2015)	Impact of Spirituality on Well-Being among Old Age People	*International Journal of Indian Psychology*	Comparative Study	50-65 years	100	Spirituality Attitude Scale and Well-Being Scale

12.	Hajbaghery & Faraji (2015)	Comparison of Happiness and Spiritual Well-Being among the Community Dwelling Elderly and those who Lived in Sanitariums	*International Journal of Community Based Nursing and Midwifery*	Comparative Study	60 years and above	384	SWBS, OHQ
13.	Rahimi, *et al.,* (2013)	Exploring spirituality in Iranian healthy elderly people: A qualitative content analysis	*Journal of nursing and midwifery research*	Qualitative	65-86 years	17	Self-made semi-structured interview format
14.	Palaniswamy & Ponnuswami (2012)	Spirituality and Mental Health among the Elderly practising Spirituality	*Journal of Research, Extension and Development*	Descriptive	60 years or above	30	DASS, Spiritual Well-Being Scale, Religious Well-Being Scale, Existential Well-Being
15.	Palaniswamy & Ponnuswami (2012)	Spirituality, Stress and Wellbeing among the Elderly practising Spirituality	*SamajaKaryadaHejj egalu*	Qualitative, Descriptive research design	60- 75 years	30	DASS (Depression, Anxiety and Stress Scale), Spiritual wellbeing scale (SWB) developed by Paloutzian and Ellison (1982)
16.	Derezotes & Evans (2010)	Spirituality and religiosity in practice: In- depth interviews of social work practitioners	*Social Thought*	In-depth Interview	Mean age = 43 years	56	In depth Interview Instrument
17.	Cohen, *et al.,* (2010)	The role of religion in the well-being of older adults with schizophrenia	*Psychiatric services*	Cross-sectional study	55 years and older	113	CES-D, PANSS, Strain Scale, Multi-level Assessment Inventory

18.	Mc Farland (2009)	Religion and Mental Health Among Older Adults: Do the Effects of Religious Involvement Vary by Gender?	*The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*,	Longitudinal Study	66-95 years	1500 (1st wave) 1024 (2nd wave)	Core Study measures
19.	Low & Elliott (2009)	The Role of Religious Activity and Spirituality in the Health and Well-being of Older Adults	*Journal of Health Psychology*	Qualitative	50 to 95 years	425	Religious involvement Scale, Spiritual Well-being Scale (Ellison, 1983), Psychological Well-being (PWB; Ryff, 1989; Ryff& Keyes, 1995), Health Behavior Check List (HB; Vickers, Conway, &Hervig, 1990), Social Provisions Scale (SPS; Cutrona& Russell, 1987)
20.	Boscaglia, *et al.,* (2005)	The contribution of spirituality and spiritual coping to anxiety and depression in women with a recent diagnosis of gynecological cancer	*International Journal of Gynecological Cancer*	Cross-sectional study	20-70 years	123	Beck Depression Inventory, State Anxiety Scale, Spiritual Involvement and Beliefs Scale-Revised
21.	Kirby, *et al.,* (2004)	Spirituality and Well-Being in Frail and Non-frail Older Adults	*The Journals of Gerontology*	Comparative	65 to 95 years	233	Frality measure of Strawbridge, Psychological Well-Being Scale, Spiritual Scale

22.	Meisenhelder & Chandler (2002)	Spirituality and Health Outcomes in the Elderly	*Journal of Religion and Health*	Cross-sectional survey	Over 65 years	250	SF-36, Religious Coping Index, Self-made questionnaire for measuring dimensions
23.	Mackenzie, *et al.,* (2000)	Spiritual support and psychological well-being: older adults' perceptions of the religion and health connection	*Alternative therapies in health and medicine*	Qualitative research (i.e., focus groups and interviews)	66 to 92 years	41	Religious Belief Scale, Spiritual Support Scale
24.	Ashby &Lenhart (1994)	Prayer as a coping strategy for chronic pain patients	*RehabilPsychol*	Descriptive, Cross-sectional study	Mean age = 45 years		MCMQ, CSQ, WHYMPJ

Discussion

The study aimed to investigate the role of spirituality on the mental health of the elderly. As revealed by all the studies, spirituality has a significant positive impact on the mental health of hypertensive elderly people. Higher levels of spirituality among hypertensive elderly significantly correlated with lower levels of somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression (Papathanasiou, *et al.*, 2020). The results are also in line with a study by Rahimi, *et al.*, (2013), which revealed that prayer has a significant relationship with the meaning of life and spiritual health. Spirituality has a considerable effect on the health and life of elderly people and is a major supportive resource for their physical and psychosocial health. It can reduce mental distress and induce inner peace and hopefulness. Higher levels of spiritual belief are associated with better quality of mental health among the elders practicing spirituality. Spiritual beliefs and practices help many physically and mentally, reducing both symptom severity and relapse rate, speeding illness up and enhancing recovery, as well as rendering distress and disability easier to endure. Spiritual care is a way of helping older people in their search for hope and meaning, especially as they face issues of grief, loss, and uncertainty (Palaniswamy & Ponnuswami (2012). Spirituality and spiritual coping are important (Boscaglia, *et al.*, 2005) and have a favorable impact and relationship with well-being among old age people. Spiritual people have good well-being and they are well-adjusted in society. Spiritual well-being and prayer contributed to the prediction of psychological well-being, subjective well-being, alleviation of physical symptoms, and easing of depression, even when the contributions of age, gender, healthy behaviours, and social support were included (Lawler-Row, and Elliott, 2009). Spirituality works as a coping mechanism and a tool to manage their daily lives in a happier and more peaceful way (Kumari, and Sharma, 2018). Kirby, *et al.*, (2004) conducted a comparative study on Frail and Non-frail Older Adults which revealed that spirituality is a resource

in maintaining psychological well-being (PWB) and that the use of this resource is more significant for individuals with greater levels of frailty. Spirituality and satisfaction with social support as modifiable variables, in the quality of life of older people (Lima, *et al.*, 2020) and there is a significant association between the level of Subjective Well-Being and happiness among the elderly (Hajbaghery, and Faraji, 2015).

The result of the study unveiled that spirituality had a positive impact on subjective well-being and this relation is unaffected by the individual's religious status. Relationship between religiosity and subjective well-being changes across religious status (Villani, *et al.*, 2019), and religion, spirituality, and/or belief were found to play a number of roles in every life of the older adults (Malone, and Dadswell, 2018). Although clients show a diversity of experiences and opinions, spirituality and religion are important issues in the lives of postmodern students, practitioners, and their clients (Derezotes, and Evans, 2010). Having higher levels of both spirituality and religiousness were more correlated to better outcomes than having just one of them or none of them. Likewise, having higher levels of religiousness to the detriment of higher levels of spirituality was also associated with better outcomes in comparison to others (Vitorino, *et al.*, (2018). When describing the experience of spirituality as an important strategy for finding meaning in life, the elderly persons in this study revealed it to be psychic and emotional support for coping with existential challenges (Scortegagna, *et al.*, (2018).

Religious affiliation is significantly associated with higher Positive Mental Health, but not with mental disorders in an Asian community setting. Different religions showed unique patterns of association with Positive Mental Health subcomponents (Vaigankar,*et al.*, 2021). Religious belief may have a significant influence on the psychological well-being of older adults, and the subjective experience of spiritual support may form the core of the spirituality-health connection (Mackenzie,*et al.*, 2000). Religiousness may have a favorable impact

on the quality of life of older adults with schizophrenia, and it must be considered along with other therapeutically important agents (Cohen,*et al.,* 2010). The relationship between organizational religious involvement and mental health is found to be mostly a non-linear one such that those with the highest levels of religiosity receive all the benefits (McFarland, 2009). The elderly who were remarkably engaged in religious activities had better Quality of Life and cognitive function as compared to those elderly who were either less engaged or did not practice religious activities (Amir, *et al.,* 2022).

Conclusion

Spirituality as a meaningful engagement leads to active and joyful ageing. Spirituality is a journey that begins with self-discovery. One of the major problems during this phase of life is loneliness which creates anxiety and depression in elderly people. Spiritual practices may help the elderly to overcome their loneliness.

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Understanding Place Concepts for the Ageing – A Research Review

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ABSTRACT

The objective of this review paper was to investigate the current status of place research. The paper briefly traces the beginnings of place research since the mid-20th century and discusses the research outcomes of the last 30 years in developing theoretical concepts. The significance of place identity concepts with respect to the elderly is highlighted and the practical implications of the research are discussed.

Keywords: Place identity, Phenomenology, Lifeworld, Place attachment, Meanings, Ageing

Place is a universal concept in the human-physical world relationships and is studied in the fields of geography, psychology, sociology, architecture, and urban design. The place is not just a physical or geographical concept, but a psychological precept of our understanding of our physical world. Place is a mental construct of

physical reality entwined with meaning. Kevin Lynch (1960), in exploring the image of the city, analyses identity, structure, and meanings as the components that people associate with places and elements in the urban realm. The meanings may be social, historical, functional, economic, or personal and these associations are often beyond the physical attributes of the elements, though the meanings can be reinforced by the actual physical attributes.

1. Domain of Place

It was Lukermann (1964) who, in the humanist tradition, brought geography out of the physical location domain to its inherent link with human thought, events, and perceptions. The physical attributes of the area with its cultural and historical experience of mankind are, what he concluded as, the 'study of places'. The place thus became central to the field of environmental psychology. Edward Relph (1976)'s 'Place and Placelessness', brought place concepts into the mainstream of research in geography, psychology, and architecture.

Yi-Fu Tuan's writings expounded on the human experience of this world bringing together the sensory, cognitive, and perceptual experiences in understanding place. While he has articulated how architecture is defining place, his astute reasoning into the concept of place through time shows an in-depth understanding of human perceptions and temporal measures. Objects, including city elements, anchor time and place for us, as man is a creation of his past. (Tuan, 1979)

Schulz (1980) very explicitly brought place into the scope of phenomenological study defining it as "a qualitative total phenomenon which we cannot reduce to any of its properties". He proposed that places have a character defined by their function or use while being a function of time, material, and elements. Alexander (1979) aptly recognises that every place is given its character by certain patterns of events that keep happening there. Relph (1976) identifies physical setting, activities, and meanings as the 3 distinguishable but intertwined components of place.

Phenomenologists interpret the person-environment relationship as 'an un-dissolvable unity', as against the person-world dualism of the realist, since consciousness, cognition, and experience are mutually intertwined. (Seamon, 1982)

A place has different images for different people, and again a place can have multiple different images of one person depending upon the mixing of experience, emotion, memory, imagination, situation, and intention (Relph, 1976). Lynch (1960) defined the common overlay of images of a place as the public image or the imageability of a place.

2. Place concepts

Concepts and attributes of place have often been termed differently in the various disciplines of study. Terms and traditional research methods are discussed herein.

2.1 Sense of place and spirit of the place

Sense of place is a psychological construct of our experience with our environment. Steele (1981) defines a sense of place as "the particular experience of a person in a particular setting (feeling stimulated, excited, joyous, expansive, and so forth)." Tuan (2003) describes an individual's sense of place as both a biological response to the surrounding physical environment and a cultural creation. Sense of place is the faculty by which we grasp the spirit of place and which allows us to appreciate differences and similarities. The Spirit of place exists primarily outside us, (but is experienced through memory and intention), while the sense of place lies inside us (but is aroused by the landscapes we encounter) (Relph, 2008).

Schulz (1980) contends that the genius loci or spirit of place is an intrinsic character of the natural site and presupposes its basis in places' inherent qualities of the site and physical environment.

2.2 Identity of place and place identity

It needs to be clarified that place-related identity has two related, yet different, concepts: 'place-identity' as a subset of self-identity is a

socio-psychological concept, and 'identity of place' as a spatial-cultural concept is anchored in the physical and experiential attributes of the place. Identity of place is a perception by individuals but characterised by its attributes – be it physical features, spatial forms, historical associations, or cultural characteristics such as language, food, and art (Peng , *et al.,* 2020). It is undeniable that both these concepts influence each other in more than one way.

We grow up in multiple environments and our identity presupposes the identity of place (Relph, 1976). Pros Hanky, *et al*., (1983) expound on place-identity as a subset of self-identity and, just as any of the self-concepts, it modifies over an individual's lifecycle. While generally, individuals tend to be unaware of cognitive structures with reference to self-identity, in the case of place-identity it is even more so, as the physical settings are 'backdrops' to the social events or interactions which are the more conscious experience. A basic property of place identity as a cognitive sub-structure of self-identity is that it consists of innumerable cognitions related to past, present, and anticipated physical settings, at conscious and subconscious levels. And thus it influences what each of us sees, thinks, and feels in our situational transactions of the physical world. Four functions of place-identity with reference to integration with our self-identity have been theorised: recognition function, meaning function, expressive requirement function, mediating change function, anxiety, and defense function. (Proshanky, *et al.*, 1983).

Proshanky (1983) voiced in his theoretical formulation that place-identity is not one but a variety of identities, influenced by the multiple social roles and social identities of persons. Sense of belonging and identification with a city or an urban setting can be different for different social groups and at different ages in a life cycle.

2.3 Place attachment

Place attachment is defined as one's emotional or affective bonds with a place. While the concept has been researched in psychology and geography, it has gained importance through its practical

implications in migration studies and spatial design. (Low & Altman, 1992)

2.4 Measuring place concepts

Since the 1960s, researchers in psychology and geography have been studying these concepts for empirical validity. The observation study, perception surveys, and psychometric scales have been the main research tools. Empirical measurement of place concepts and scales have been well documented and reviewed in Shamai (1991), Lalli (1992), Bonaiuto, *et al.,* (2003), Giuliani (2003), Kyle, *et al.,* (2004 a,b, 2005), Lewicka (2008, 2011b). Williams & Vaske (2003), Raymond, *et al.,* (2010) have tested the psychometric scales in measuring place attachment.

Stedman (2002) has empirically tested a model of sense of place and behavioural implications. He has used symbolic meanings, evaluative perceptions, place attachment, place satisfaction, and behaviour intention as measures tested through a Likert-based questionnaire to residents of a lake property in the US. The study confirms the theory of place satisfaction strongly based on cognitive attributes of the setting and emphasises symbolic meanings in the sense of place. He also remarks on the role of people–environment studies as a precursor for understanding and moulding pro-environment behaviour. In his research on the physical aspects of the place, Stedman (2003) concludes that the applicable model considers characteristics of the physical environment as the basis of meanings, which in turn affect attachment and satisfaction, rather than the physical environment by itself.

Bernardo, *et al.,* (2012) have interlinked the social and psychological aspects of place and the study contributes to the systemization of the concept of place identity. The study is carried out with four localities of Lisbon as well as validated with a study of two groups of university campus students. Fornara, *et al.,* (2010)'s cross-validation study gives a reduction in the number of items of Perceived Residential Environmental Quality (PREQ) and

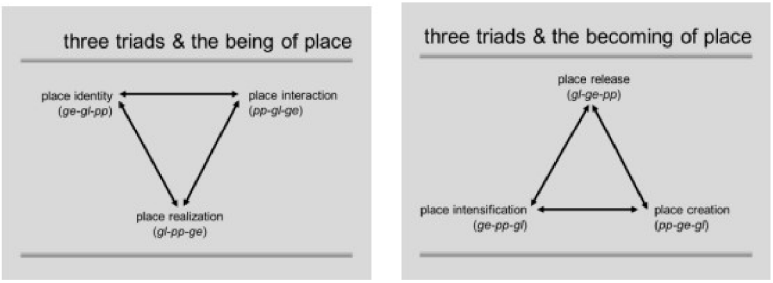
neighbourhood attachment. Choi, *et al.*, (2016) test a model of place attachment to conclude that place attachment to the home environment is formed on the basis of housing satisfaction, and is more affected by physiological and psychological satisfaction than physical satisfaction.

Herzog (1992), and Mehta (2007, 2014) have sought to work with the characteristics and features of urban spaces and people's perceptions. The Public Space Index uses the five dimensions of meaningful activities, inclusiveness, pleasurability, comfort, and safety. (Mehta, 2014). Evans, *et al.*, (2019) have carried forward Mehta's Public Space Index with reference to public parks, testing its versatility. Gokce & Chen (2021) have used an empirical assessment of the sense of place over three spatial scales – building, street, and neighbourhood.

3. Towards a phenomenological approach

Seamon (1982) argues for a phenomenological approach beyond the conventional approach to explore the links of emotional experience with the world that it occurs in – environments, places, and landscapes. He takes up the concept of the lifeworld of Husserl and expands it with reference to the built environment. Lifeworld is our everyday realm of experiences taken for granted and not perceived specifically as a phenomenon. The lifeworld is accepted as a given and accepted unquestionably as a 'natural attitude'. The phenomenological study aims to pay attention to lifeworlds to understand how human life incorporates a lived complexity and 'place is the lived component of lifeworld that is most relevant for examining architectural experience and meaning'. In a triadic understanding of place experience, he explores the people–place relationship through the terms of the geographical ensemble (ge), people in place (pe) and *genius loci* (gl). (Fig 1). Place has the potential through the triad of realization to transform a material setting into a lived geography with its *genius loci*. (Seamon 1982, 2000, 2008, 2012, 2017)

Fig 1
Triads of place



(Source: Seamon 2012)

Buttimer (1980) explains the lived reciprocity of rest and movement, of territory and range for living forms, which should show up in the context of our places. She questions the outsider approach of urban planning for people who 'dwell' within. The temporality of place in perceptions and memories of urban dwellers is well discussed by Blunt, *et al.*, (2020), underlining the notion that the process is not always passive. Mazumdar (2004, 2005) discuss the issues of place identity with reference to sacred places.

4. Developing theoretical basis of place attachment

The human attachment to place has been studied by various known researchers. Tuan & Bachelard called this bond 'topophilia' involving "all affective ties with material environment" Tuan(1974). Graber (1976) and Engel (1983) linked this attachment with sacred places. Relph (1976) has theorised most eloquently on the typology of place and place attachment, ranging from existential insideness, empathetic insideness, behavioural insideness, incidental outsideness, objective outsideness, existential outsideness to placelessness.

The cognitive behavioural approach to place identity draws on the social cognitive theory that human behaviour is not determined via unidirectional causation but is multidirectional through the interaction of personal factors including cognition, the environment, and behaviour. Place attachment, self-esteem, self-efficacy, continuity, distinctiveness, familiarity, security, sense of belonging, rootedness, commitment to

place, and experiential value are identified as the key sub-dimensions of place identity. (Fresque-Baxter 2012, Uzzell, *et al.*,, 2002, Twigger-Ross, 1996, 2003, 2013).

Hauge (2007) reviews three identity theories and highlights the gaps in research to explore relationships with reference to place and identity. Scannell & Gifford (2010a) propose the person-process-place framework to explain place attachment and its functions as manifest through affective, , and behavioural psychological processes. Gustafson (2001) investigates the meanings of place through open interviews bringing out themes in how meanings are formed.

Hernandez, *et al.*, (2007) point to variation in the intensity of place attachment and place identity with reference to natives and non-natives, which signifies place attachment is developed before place identity. Casakin, *et al.*, (2015) carried forward Hernandez, *et al.*, (2007)'s framework with reference to cities in Israel, wherein this variation in intensity between place attachment and identity was not pronounced. Hull, *et al.*, (1994) identified place identity as a significant construct with possible causal links to human coherence, health, and a sense of community through place icons as symbols. Rollero & De Piccoli (2010) studied place attachment and identity with reference to social relationships, gender, and age in the town of Turin in Italy, wherein a higher tendency was observed in women to develop and maintain social bonds in the local area.

Simandan (2011, 2016) directs the theory on how memory systems create our place concepts and the need for a multi-disciplinary approach to understanding place and well-being, as well as the need to anchor the studies in different cultural contexts. Aguila, *et al.*, (2019) hypothesize affect, cognition, physical setting, and behaviour as four facets in the theory of place in public space and test it using facet theory with recommendations for place-making.

5. Reviewing place research:

Lewicka (2011a)'s exhaustive review of place attachment is an ideal starting point for place research today. Manzo (2003), in his

review, has taken the discussion to how places outside of the residence are significant and can alter our self-concept. Ardoin (2006) has emphasised the need of a holistic multidimensional concept for a sense of place emerging from the multidisciplinary basis of the concept. Korpela (2012) has discussed in detail the process of place attachment and the consequences of attachment. Vidal, *et al.*, (2012) review research works and provides a theoretical framework highlighting the importance of the relationship between place identity, landscape, and restorativeness. Peng, *et al.*,(2020) have used scientometric analysis to assess the current level of place research.

6. Place research in a broader sociological context:

Hayden (1995) contends the place is a repository of the people and their individual and group histories and hence its role as an artifact of public history cannot be denied. Creswell (1996) elaborately discusses the ideological precepts implicated by place and how 'appropriateness' or 'order' can signify access, equity or marginalisation. Massey (1994) puts up a broader way of looking at places and migrations in terms of networks whether at a street or regional scale. Forced displacements have a direct relationship to the strength of place attachment (Lewicka, 2008; Fried,2000). In localities with ethnic groups and contended socio-political histories, simplifying place-based struggles in the context of large-scale development is unwise (Dupka, *et al.*,, 2018). In the context of globalisation, consumerism, and media creating a transnational capitalist class, Adam (2012) puts an iota of responsibility on the architectural profession in ignoring the identity of place.

7. Researching Place and the Elderly

With increasing life expectancy and larger elderly populations, research on aging and its aspects gain increased importance. Place attachment is especially significant to older people in multiple ways (Rubinstein & Parmelee, 2012):

- feelings of experiences with key former places can be instrumental in remembering and accessing one's life course

- attachment to current place can be a way of strengthening self-image
- attachment to current place acts as a way of representing independence and continued competence in daily life

Later age person-environment relations are important as they change with a person's changing abilities. As personal competencies decline, the importance of the objective physical environment as an influence on behavior increases. 'Normal' environments become more constraining as one's capacity to act upon them wanes; the locus of primary agency or control shifts from person to the environment as one's activities begin to be dictated not by what one wishes, but by what one is able to accomplish. (Rubinstein & Parmelee, 2012).

Rowles (1983)'s empirical study on place attachment hypothesizes the levels of adaptation of the concept in the elderly: besides physical and social insideness, autobiographical insideness is a typical feature of how persons get attached to place and plays a role in adaptation in old age. The comparative study of professionals and older adults in a province in the Netherlands points to the differences in the ways that meanings are associated with elements by the older adults, ranging from autobiographical memories, intangible associations, and environmental care (Hees *et al.*, 2017). De Alba (2012) has used a mixed ethnographical phenomenological research methodology with the elderly in Mexico City to explore how social meanings are constructed into biographical urban memory. The study uses thematic analysis of the discourses of senior residents to catalog the perceived changes in the memories of the city. She acknowledges the limitations of the tools (*Atlas.ti, Alceste*) to handle large amounts of text or geographical and spatial data.

Empirical studies with older adults regarding place concepts and linkages with life satisfaction have shown a strong desire to age in familiar settings. The studies point to the interactions with the place creating personal and social meanings. (Casakin & Neikrug, 2008, 2012; Cook, *et al.*, 2007; Wiles, *et al.*, 2012). Smith & Cartlidge

(2011) emphasise the needs of ageing in place: such as the comfort of familiar landmarks aiding to reinforce self-identity.

Even within the senior population, gender differences exist considering the roles and choices available. A study of places in Rome points to pre-dominant confinement of older persons, especially women, to home residence vis a vis other urban places, but whether this has a relationship to accessibility is not tested herein (Bonnes, *et al.*, (1990). Retired elderly women rate freedom of choice as an important characteristic of leisure themes, and leisure activities range from meaningful social activities, fun, and travel to 'self' time. (Gibson, *et al.*, 2003).

McHugh & Mings (1996) bring into discussion the changing facets of elderly mobility and migrations. Their study looks into the lives of seasonal elderly migrants and the concept of multiple place attachments. It is noted that attachment to the home, neighbourhood, and city shows no major difference among the elderly group, whereas the young show a stronger affinity to the city, and the middle-aged group shows a higher attachment to home (Hidalgo & Hernandez, 2001).

Rioux & Werner (2011) have attempted to understand the way in which the elderly perceive residential and neighbourhood satisfaction in semi-rural European settlements. Burholt (2012) has developed a model of place attachment for older persons in rural areas of U.K.

Longitudinal studies of the elderly pre- and post-street intervention have shown a positive link between interventions and perception of walkability and safety (Thompson, *et al.*, 2012). Sun, *et al.*, (2020) have investigated the mediating factors including the built environment, community facilities, residential design, and social attributes for place attachment among older citizens in dense urban neighbourhoods in China.

Mitchell & Burton (2006) have studied the use of urban outdoors by people with dementia to bring in recommendations for design implications for dementia-friendly urban spaces. Their research points to six characteristics of space: familiarity, legibility, distinctiveness,

accessibility, comfort, and safety. McLaughlan, *et al.*, (2018) advocate diversifying the approaches to urban design for dementia citizens beyond wayfinding and safety, with an emphasis on the retained abilities of persons with dementia, such as direct sensations and their capacity to participate in social life.

Cassarino and Setti (2016) have reviewed the complexity of an environment with reference to aging in place. They emphasise the need for exploring relations between different measures of complexity at the micro, meso, and macro environmental scales: such as understanding whether complexity at a micro-scale (e.g., perceptual load) is correlated with complexity at a meso scale (e.g. neighborhood legibility). Philips, *et al.*, (2011) have demonstrated ways to measure the urban dimensions of placelessness and attachment for the elderly and the design implications therein. Lewis & Buffel (2020) point out that the relationships between 'places of aging' and 'ageing in place' change with time and is often dependent on personal competencies and life histories.

8. Implications and Scope of Place research with reference to ageing

The most relevant part of place research is its applicability in directing the creation of places beneficial for life satisfaction. Since all our life is anchored in places, research can go a long way toward our understanding of better places. In a fast ageing society, insights into place attachment with reference to the elderly gain significant practical relevance. Globally the 60+ age group constitutes 11 percent (2015) projected to be at 22 percent by 2050. In India, this 60+age group constitutes about 10 percent (2021) and is projected to be at 13.1 percent by 2030, and 19 percent by 2050 with nearly 300 million elderly. (NSO, 2021; UNPF, 2017).

With increasing nuclear family set-ups even in Asian countries, the adaptation levels to the proximate environment become a prerequisite for living. Hence the need to make the environment conducive for the elderly to function is a primary need for the

transgenerational design of neighbourhoods. Rapid transformations in the urban fabric can be stressors, especially for the elderly. Migration from a place of attachment due to flailing health or limitations in mobility or healthcare requirements can create further mental stress of deprivation. Hence assuring place continuity for elders through planning, providing daily services at walkable distances, and providing for walkability are strategies that can help integrate the elder population as a 'social asset' (Iecovich 2014).

Low attention to the physical nature of places and processes of meaning formation, and lack of development of theory despite active research are the major gaps identified in place research (Lewicka 2011a; Hauge, 2007). The thrust now is towards a 'non-positivist' (Mazumdar, 2005) research approach with 'qualitative/subjectivist/ critical reflexive approaches' (Manzo & Carvalho, 2021) to place attachment to understand the phenomenon in all its ramifications, acknowledging socio-political equations and researcher outlook. In the context of ageing-related place identity and attachment premises, longitudinal studies can have a prominent role in the development of grounded theory.

As Rubinstein & Parmelee (1992) posit, place attachment is not a state but a process that continues throughout life, and with aging and a decline in personal competencies, the suitability of the environment to support one's functions gains importance. Place research has valuable potential for planning and designing for 'aging in place' not only at the residential unit level but the neighbourhood level and city level.

Most research is converging on the importance of how meanings of the physical environment are woven into psychological perceptions; thus the process of meaning formation needs to be understood. The author also suggests the need for place-meaning research to link childhood experiences and the development of place-related constructs through longitudinal studies. Naturally, causal relationships are difficult to establish in real-life situations with multiple variables; yet an in-

depth look is a pre-requisite to the development of theory not only in environmental psychology, but developmental psychology and social psychology as well. While cyber-space and global mobility change our perceptions, place research gains importance in understanding personal psychology and stability in social and socio-political systems. Virtual reality has scope in enriching experiences of places and activities for the elderly with decreasing competencies (Chaze, *et al.*, 2022; Tasoff, 2021)

An important aspect in research and policy-making for the elderly is to work 'with' the target group rather than 'on' them, to understand their perception of their environment rather than evaluating the problems as outsider experts (Wiley 2012, Hees, *et al.*, 2017). In the Indian context, there is a need for research to develop and support policies and their implementation strategies. The concepts of mixed-age neighbourhoods, local caregiving facility centres, elderly support groups, and seniors' involvement in renewal or redesign projects are acceptable practical solutions for an aging society. The challenges of ageing in place have to be dealt with at public policy and strategy levels.

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Prevalence of Cognitive Frailty and its Association with Activities of Daily Living among Community-dwelling Older Adults: Evidence from LASI Wave

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ABSTRACT

This study intended to determine the prevalence of cognitive frailty and describes its association with activities of daily living in older adults.This was an analysis of secondary data from the Longitudinal Aging Study (LASI) in India wave-1. A total of 23,678 respondents aged e"60 years were included. Frailty was assessed using modified Fried criteria and cognitive impairment using various domains derived from the cognitive module of the Health and Retirement Study. The co-occurrence of physical frailty and cognitive impairment was termed cognitive frailty. The analysis of the data revealed that the prevalence of physical frailty, cognitive impairment, and cognitive frailty was 27.9 per cent, 10per cent, 5.4per cent, respectively. The prevalence of cognitive frailty was higher in women, advanced age, and illiterate respondents. After adjusting

for possible confounders, cognitive frailty remained significantly associated with ADL and IADL functions. The highest odds were observed for picking up a coin (OR:3.55 CI:3.0-4.21), carrying weight (OR:3.12 CI:2.74-3.56), and grocery shopping (OR:3.48 CI:3.04-3.98). On the basis of these findings, it may be concluded that cognitive frailty is a vital indicator for identifying older adults at high risk of developing severe disabilities. Development of screening tools using daily activities involving fine motor skills and including cognitive components in the care plan can prevent or delay cognitive frailty and functional decline.

Keywords: ADL, Cognitive frailty, Functionality, IADL, Older adults

Cognitive frailty is the coexistence of physical frailty and mild cognitive impairment. (Kelaiditi, *et al.*, 2013). Physical frailty is known to increase the vulnerability of older adults to adverse health outcomes such as falls, disability, hospitalization, restricted mobility, and mortality (Clegg, *et al.*, 2013). Cognitive impairment is an intermittent stage between age-related cognitive decline and dementia and has accelerated adverse health consequences for an individual (Geda, 2012). The co-occurrence of these two conditions further accelerates physical and cognitive functional decline(Avila-Funes, *et al.*, 2009; Feng, *et al.*, 2017). Cognitive frailty is considered a physiological precursor to degenerative nervous system diseases, which could play a key role in predicting short term and long term all cause mortality and adverse health outcomes. Thus, it could also offer a new target for the prevention and intervention of pathological ageing (Bu, *et al.*, 2021). Research shows that cognitive frailty is related to an increased risk of hospitalization, mortality, disability, and dementia (Lu, *et al.*, 2022). Due to its catastrophic health outcomes, knowledge of the burden and associated factors of cognitive frailty is important for geriatric care management.

The literature provides a wide range of prevalence estimates for cognitive frailty. It ranged from 2.4 percent to 50.1 percent in Asia, 5.4 percent to 12.1 percent in North America, 1 percent to 22.6 percent in Europe, and 3.1 percent in South America (Qiu, *et al.*, 2022). India, the second-most populous country in the world, has about 138 million people above 60 years of age, which is projected to increase by 56 million in 2031(ELDERLY in INDIA, 2021). Due to a large number of older adults in the country, cognitive frailty may emerge as a significant problem in the near future. Compared to high-income countries, the adverse consequences of cognitive frailty in low and middle-income countries will be more significant, mainly because of the lack of a specialized and trained workforce and health care facilities especially rehabilitation care to cater to the specific needs of this group (Evans, *et al.*, 2011). Literature suggests that closer attention to the elderly with low income and poor self-care ability may play an important role in the early prevention of cognitive frailty. Early intervention for the population with cognitive frailty can help prevent dementia and other aggravations (Lu, *et al.*, 2022). Therefore, recognizing the issue and generating evidence to create relevant services is a priority.

Cognitive frailty is reported to acceleratethe functional decline. (Brigola, *et al.*, 2020) Functional decline increases the risk of dependence, which leads to shrinking social networks and low life satisfaction among older adults (Asakawa, *et al.*, 2000; Sugimoto, *et al.*, 2020). Individuals with cognitive frailty experience the highest risks of IADL limitations (Shimada, *et al.*, 2016). However, little is known about the link between cognitive frailty and functional decline. More literature from low-middle-income countries will help in a deeper understanding of this association. Further research in this domain may reveal possible early indicators of both functional and cognitive decline. Therefore, the current study aims to determine the prevalence of cognitive frailty and examine the association between cognitive frailty and activities of daily living (ADL) and instrumental activities of daily living (IADL) among

Indian older adults using secondary data collected for Longitudinal Ageing Study of India (LASI) wave -1.

Material and Methods

Sample and Data

The present study is based on the analysis of baseline data collected for the Longitudinal Ageing Study in India (LASI) wave 1 in the year 2017-19. LASI is a nationally representative survey using a multistage stratified area probability cluster sampling design. It covered 72,262 individuals aged 45 and above and their spouses, irrespective of age, across all states (except Sikkim) and union territories in India. Within each state, a three-stage sampling design in rural areas and a four-stage sampling design in urban areas were adopted. The rural sample was selected using multistage sampling at sub-districts, village and household levels. While in the urban area, the sample was taken by randomly selected sub-district, cities, Census Enumeration Block and households. Data were collected by trained interviewers who received 35 days, including five days of field training. LASI provides vital scientific information on demography, family economy, physical health, social health, mental health (cognition and depression), functional health, biomarkers, healthcare utilization, health insurance and life expectations. Further details regarding the sample size, survey design and instruments, fieldwork, data collection and processing, and response rate are publicly available in the LASI report. (LASI Wave-1 Executive summary, 2021)

The present study included individuals aged 60 years. Out of 72,262 individuals in the original dataset, 31,477 fulfilled the selected age criteria. Further, the present study considered respondents with complete records of handgrip strength, walk test, height, weight, and cognitive variables as frailty and cognitive frailty assessment is based on this data. Respondents who received assistance with cognition-related questions were excluded. Therefore, the final sample included in the analysis is 23,678 individuals from across the country.

Study variables:

1. *Demographic variables* : Age was classified into three categories which were 60-69 years, 70-79 years and ≥80 years. Responses on education were recoded into three categories: illiterate, up to high school (primary, middle school, secondary and higher secondary) and graduate and more (degree/certificate/diploma, post graduate/professional).
2. *Physical Frailty* : Physical frailty was assessed using modified Fried phenotype criteria (Fried, *et al.*, 2001), which include deficits in five domains: Shrinking (BMI < 18.5 kg), slowness (gait speed < 0.8 m/s assessed using a 4-meter walk test), weakness (handgrip strength below 20th percentile on the dominant hand), low physical activity (hardly or never performing moderate and vigorous activities), low endurance (frequent experience of tiredness and resting in bed during day). Based on Fried phenotype criteria, individuals with three or more deficits were categorized as frail.
3. *Cognitive impairment* : Cognitive impairment was assessed using five broad domains derived from the cognitive module of the Health and Retirement Study (HRS). It includes a memory (assessed using immediate and delayed word recall), orientation (assessed using time [date, month, year, day] and place [district, village, landmark, place used for]), arithmetic function (measured through backward counting, serial seven, and computation method), executive function (assessed using paper folding and pentagon drawing method), and object naming (assessed by asking to name the shown objects). Adding all the measures produced a cognitive function score between 0-43, with a higher score indicating better cognition. The present study used the lowest 10th percentile to measure cognitive impairment (Muhammad, and Meher, 2021)
4. *Cognitive frailty* : Based on the definition laid by the international consensus group (Kelaiditi *et al.*, 2013), cognitive frailty was defined as the co-occurrence of physical

frailty and cognitive impairment. Therefore, respondents reporting a frailty score of ≥ 3 and a cognition score below the 10^{th} percentile were considered to have cognitive frailty.

5. *ADL* : The assessment included a total of nine daily activities, which were walking for 100 yards, sitting for $\geq$2 hours, arising from a chair, climbing one flight of stairs, stooping/kneeling/ crouching, extending arms above shoulder level, pulling or pushing large objects, lifting or carrying weights over 5 kg and picking up a coin from a table.
6. *IADL* : A total of 6 activities-managing money, grocery shopping, meal preparation, medication use, working around the home or garden, and using a telephone, were included in the IADL assessment.

The original dataset recorded each ADL and IADL activity as a dichotomous variable coded as 1= difficulty in performing the activity and 2= No difficulty and used as it is in the current study.

Statistical analysis : The prevalence of physical frailty, cognitive impairment, and cognitive frailty was calculated using descriptive statistics. For analysis, respondents were categorized into four categories (i) Robust (without frailty or cognitive impairment), (ii) only physical frailty, iii) only cognitive impairment iv) cognitive frailty. Chi-square statistics were used to study the association between the study variable and population characteristics. Multinomial logistic regression was used to study the association of physical frailty, cognitive impairment and cognitive frailty with difficulty in ADL/IADL functions with reference to robust category. In the adjusted model, the odds of each ADL and IADL function were calculated separately, adjusting for possible confounding factors (age, gender, education, co-morbidity, chronic pain, and fractures of bones/joints). A p-value of <0.05 was taken to define statistical significance. All statistics were performed using IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp.

Ethics : Although this paper is based on secondary data analysis, the original study reports compliance with research ethics. The LASI study received ethical clearance from the Indian Council of Medical

Research. Participants were provided with information brochures explaining the purpose of the survey, and consent forms were administered to each eligible individual. All the personal identifiers were removed from the dataset to ensure confidentiality. Other details are available in the report published on the website (LASI Wave-1 Executive summary, 2021).

Results

Table No 1

Population characteristics and their association with cognitive frailty.

Variable		Robust (No physical frailty no cognitive impairment)	Only Physical Frailty	Only Cognitive Impairment	Cognitive Frailty (both Physical frailty and cognitive impairment)	p-value
Age in years	60-69	11405(76.3)	2529(16.9)	628(4.2)	393(2.6)	<0.001
	70-79	3861(57.7)	1985(29.6)	344(5.1)	506(7.6)	
	80+	704(34.7)	821(40.5)	120(5.9)	382(18.8)	
Gender	Male	9196(77.4)	2083(17.5)	332(2.8)	268(2.3)	<0.001
	Female	6774(57.4)	3252(27.6)	760(6.4)	1013(8.6)	
Ever attended school	Yes	9254(79.4)	2180(18.7)	104(0.9)	123(1.1)	<0.001
	No	6716(55.9)	3155(26.3)	988(8.2)	1158(9.6)	
ADL difficulty§	Yes	10660 (62.9)	4422(26.1)	772(4.6)	1106(6.5)	<0.001
	No	5310(79)	913(13.6)	320(4.8)	175(2.6)	
IADL difficulty¶	Yes	4928(53.7)	2850(31)	541(5.9)	864(9.4)	<0.001
	No	11042(76.2)	2485(17.1)	551(3.8)	417(2.9)	
Comorbidity	Yes	3575(67.6)	1313(24.8)	177(3.3)	224(4.2)	<0.001
	No	12395(67.4)	4022(21.9)	915(5.0)	1057(5.7)	
Chronic pain	Yes	6062(64.0)	2319(24.5)	484(5.1)	608(6.4)	<0.001
	No	9908(69.8)	3015(21.2)	608(4.3)	673(4.7)	
Fracture of bones/joints	Yes	505(60.2)	255(30.4)	30(3.6)	49(5.8)	<0.001
	No	15465(67.7)	5080(22.2)	1062(4.6)	1232(5.4)	

§ ADL difficulty- difficulty in performing one or more ADL functions;

¶ IADL difficulty- difficulty in performing one or more IADL functions

Table No. 2

Association of physical frailty, cognitive impairment and cognitive frailty with ADL, IADL functions (Adjusted OR)

Variable	Only Physical Frailty	Only Cognitive Impairment	Cognitive Frailty (both Physical and cognitive impairment)
	OR (95% CI)	OR (95% CI)	OR (95% CI)
Difficulty in ADL functions			
Picking coin	2.15(1.91-2.41)**	1.68(1.35-2.10)**	3.55(3.0-4.21)**
Carrying weight	2.08(1.94-2.23)**	1.45(1.26-1.66)**	3.12(2.74-3.56)**
walking	1.97(1.84-2.12)**	1.28(1.11-148)**	2.89(2.54-3.29)**
Pushing/pulling objects	1.86(1.74-1.99)**	1.21(1.06-1.38)**	2.25(1.96-2.58)**
Extending arms	1.83(1.69-1.99)**	1.41(1.20-1.66)**	2.37(2.06-2.72)**
Climbing	1.85(1.72-1.98)**	1.03(0.91-1.18)	2.13(1.85-2.45)**
Sitting	1.81(1.68-1.93)**	1.29(1.13-1.48)**	2.21(1.94-2.51)**
Arising from chair	1.77(1.66-1.90)**	1.07(0.94-1.23)	2.11(1.85-2.39)**
stooping/kneeling/crouching	1.63(1.52-1.75)**	1.08(0.94-1.23)	1.99(1.73-2.29)**
Difficulty in IADL functions			
Grocery shopping	2.31(2.12-2.51)**	1.57(1.34-1.84)**	3.48(3.04-3.98)**
Managing money	2.07(1.91-2.25)**	1.81(1.57-2.09)**	3.41(2.99-3.88)**
Meal preparation	2.31(2.10-2.53)**	1.41(1.16-1.70)**	3.40(2.94-3.94)**
Working around home/garden	2.21(2.04-2.39)**	1.38(1.18-1.62)**	2.84(2.49-3.25)**
Using medication	1.84(1.66-2.03)**	1.65(1.38-1.96)**	2.61(2.24-3.03)**
Telephone use	1.67(1.55-1.81)**	1.33(1.15-1.52)**	2.23(1.97-2.54)**

**p-value < 0.05

Table 1 describes population characteristics and their association with cognitive frailty. A total of 23,678 respondents were included in the present analysis. The participants' age ranged from 60 to 111 years, with a mean of 68.29±6.98 years. Prevalence of physical frailty, cognitive impairment, and cognitive frailty was 27.9%, 10%, and 5.4%, respectively. The prevalence of cognitive frailty increased with

increasing age. Cognitive frailty was significantly associated with female gender, illiteracy, and difficulty in ADL and IADL functions.

In the next step, multinomial regression analysis was conducted to ascertain the association of difficulty in ADL and IADL function with physical frailty, cognitive impairment, and cognitive frailty. In the first step of regression analysis, crude odds were calculated for each ADL and IADL function. Each function is significantly associated with cognitive frailty with higher odds of IADL than ADL functions (supplementary table 1). In the second step of regression analysis, adjusted odds were calculated for each ADL and IADL function, adjusting for possible confounding factors. Table 2 describes the association between ADL, IADL functions, and cognitive frailty using multinomial regression adjusted for age, gender, education, comorbidity, fracture of bone/joints, and chronic pain. All ADL and IADL functions remained significantly associated with physical and cognitive frailty. Cognitive impairment also showed significant association except for three ADL functions; climbing, stooping/kneeling/crunching, and arising from a chair. However, the odds for each function remained higher in cognitive frailty than physical frailty and cognitive impairment. Picking up a coin from a table (OR:3.55 CI:3.0-4.21), carrying weight (OR:3.12 CI:2.74-3.56), and walking (OR:2.89 CI:2.54-3.29) showed highest odds with cognitive frailty. At the same time, grocery shopping (OR:3.48 CI:3.04-3.98), managing money (OR:3.41 CI:2.99-3.88) and meal preparation (OR:3.4 CI:2.94-3.94) were some of the IADL showed higher odds with cognitive frailty.

Discussion

Based on the nationally representative data presented here, the prevalence of cognitive frailty was 5.4percent, comparable with the findings from China (6.3%) and Italy (4.4%) (Roppolo, *et al.*, 2017; Ruan, *et al.*, 2020) However, the prevalence was notably lower than that reported in the only Indian study (21.8%) conducted among rural elderly in West Bengal (Das, 2022). The vast difference in prevalence can be due to different study tools, the inclusion of both rural and urban participants, and the number of participants in the present study.

Similar to previous studies, advanced age, female gender, and lower education were significantly associated with cognitive frailty (Das, 2022; Seesen, *et al.*, 2021)

The present study compared the association of ADL and IADL functions with physical frailty, cognitive impairment, and cognitive frailty. Even after adjusting for possible confounding factors (age, gender, education, co-morbidity, chronic pain, and fractures of bones/joints), the odds of having difficulty in ADL and IADL functions remained higher in people with cognitive frailty. This finding agrees with previous observations about accelerating functional decline in older adults with cognitive frailty (Feng, *et al.*, 2017; Tsutsumimoto, *et al.*, 2020). Previous longitudinal studies also show that lower performance in ADL is an outcome of cognitive frailty. After eight years of follow-up, a study by Aliberti, *et al.*, (2019) found that people with cognitive frailty had the highest risk of ADL dependence compared with people without cognitive frailty (Aliberti, *et al.*, 2019). A similar study was conducted in china by Ma, *et al.*, (2021), where the incidence of ADL disability was 6 percent after three years, and that was 10.48-fold (CI:2.98-36.80) higher as compared with the robust older adults (Ibid). Therefore, periodic assessment for cognitive frailty may help identify older adults with a high risk of developing functional limitations. Functional abilities are essential for healthy ageing as their loss can lead to dependency, social isolation, and low quality of life(Asakawa, *et al.*, 2000).The literature discusses different interventions focusing on nutrition and exercise to prevent or delay functional decline in older adults (Gill, *et al.*, 2002; Stuck, *et al.*, 2002; Mareschal, *et al.*,2020). However, including cognitive components in these intervention programmes may increase its potential to prevent both cognitive frailty and functional decline.

Fauth, *et al.*, (2017*)* in their study among non-demented older adults, showed that cognitive speed is associated with ADL-related fine motor ability. Fine motor ability is the coordination of muscles, bones, and nerves to carry out precise movements. In the present study picking up a coin showed the highest odds (OR:3.55) for

cognitive frailty. This observation indicates a need for further research on the association of cognitive frailty and daily activities involving fine motor abilities. Such research will help to develop screening tools which will be simple, quick and require minimum resources and training. In a community setup, especially in resource-limited settings, such assessment will be economical, convenient and valuable to identify older adults needing further assessment and interventions. However, more studies with prospective designs are required to confirm the observation.

The study's main strength is the extensive population-level data, which enabled a nationally repetitive estimate of cognitive frailty. Secondly, the study's findings are internationally comparable as LASI collects information conceptually comparable to that gathered by the Health and Retirement Study in the United States and its sister surveys in Asia, Europe, Mexico, and elsewhere. To the best of the authors' knowledge, this is the first Indian study that showed an association of cognitive frailty with functional decline in such details. The study identified possible research area for further studies. There are several limitations to the study. The study was analysis of a cross-sectional data enabling only a descriptive study and no causal relationship possible in this design. Data on ADL and IADL were recorded as dichotomous responses in the original dataset, limiting the ability to understand finer differences in limitations and their association with cognitive frailty.

Conclusion

The study reported 5.4% prevalence of cognitive frailty among Indian older adults. Advanced age, female gender, and lower education are associated with higher prevalence of cognitive frailty. Cognitive frailty was strongly associated with difficulty in ADL and IADL functions with highest odds for picking up coin from table, grocery shopping and managing money. Incorporation of daily activities involving fine motor skills such as 'picking up coin from table' in screening tools may improve its sensitivity. Development of interventions with cognitive components can help to prevent or delay both cognitive frailty and functional decline.

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