Contents

FOR OUR READERS

ATTENTION PLEASE

Those who are interested in becoming a member of *Indian Geronto-logical Association* (IGA) are requested to send their Life Membership fee, Rs. 2000/- (Rupees Two thousand) and Annual Membership Rs. 500/- (Rupees Five hundred only). Membership fee is accepted only by D.D. in favour of Secretary, Indian Gerontological Association or Editor, Indian Journal of Gerontology. Only Life members have the right to vote for Association's executive committee. Members will get the journal free of cost. Life Membership is only for 10 years.

REQUEST

Readers are invited to express their views about the content of the journal and other problems of senior citizens.Their views will be published in the Readers' Column. Senior citizens can send their problems to us through our web site: www.gerontologyindia.com Their identity will not be disclosed. We have well qualified counsellors on our panel. Take the services of our counselling centre - **RAHAT.**

Helpline : 0141-2624848

VISIT OUR WEBSITE : www.gerontologyindia.com
You may contact us on : gerontoindia@gmail.com

*NEW LIFE MEMBER*S

L 606, Dr Geetika Vasisht
928/GH–14
Paschim Vihar
New Delhi–87

L 607, Dr Bikas Deka
Assistant Professor, Department of Sociology,
Dibrugarh University,
Dibrugarh - 786004 (Assam)

Age and Gender Related Test Performance in Community Dwelling Older Adults on Physical Performance and Balance

Ruchi Choudhary, Shefali Walia, Majumi M. Noohu[*]

ISIC Institute of Rehabilitation Sciences, Vasant Kunj, New Delhi, India
*Centre for Physiotherapy and Rehabilitation Sciences,
Jamia Millia Islamia, New Delhi, India

ABSTRACT

The purpose of this study was to investigate aging related changes in balance and functional capacity performance and to determine criteria values depending on age in community dwelling elderly people. Sixty elderly subjects, age varying from 60 to 89 years were included in this study. These subjects were divided into 3 groups: Group 1, (60–69), Group 2 (70–79), and Group 3, (80–89). Each group consisted of 20 subjects with 10 males and 10 females. The subjects were assessed for physical capacity and balance on Six minute step test (6MST) and four square step test (FSST) respectively. The number of steps taken by the subjects in 6 minutes was recorded in 6MST and the times taken by the subjects to complete the FSST were recorded using stopwatch. The data obtained was analyzed using independent t-test and one way ANOVA. It was found that 6MST and FSST scores were significantly different in all 3 age groups. The results showed that there is a progressive decrease in the 6MST and progressive increase in the time taken to complete FSST with increasing age. However, there was no significant difference between males and females performance in 6MST and FSST. From the results it can be concluded that there is a progressive decrease in the test performance (6MST & FSST) with

age in community dwelling elderly people. The results of this study can be used as reference values while performing performance tests for elderly people in the community.

Keywords: Physical capacity, Balance, Community, Older adults

There is a decrease in the physical capacity, balance control and gait, because of ageing, even in the absence of diseases. (Manckoundia *et al.,* 2008). Balance impairment in older adults increases the fall risk. Loss of confidence, or fear of falling often result in decreased physical activity leading to further decline in their postural stability and quality of life (Arfken *et al.,* 1994). The ability to perform activities of daily living and leisure is determined by the physical capacity of the individual (Van Velzenet *et al.,* 2006). However ageing results in an important decrease of muscle power and exercise capacity (Marcell, 2003). Therefore, elderly often function at the limit of their capacity in order to fulfill the activities of daily living (Hortobágyi *et al.,* 2003).

For people with balance and mobility deficit, restoring function or preventing further dysfunction are priorities for health care providers. To perform this rehabilitation service effectively, one must be able to identify the impairment, to provide appropriate treatment, and to evaluate outcomes using assessment tools with known measurement properties (Dite & Temple, 2002) and further more determination of the remaining physical capacity can be important in clinical decision-making.

The Four square step is a simple balance assessment tool in which the subjects have to rapidly change direction while stepping forward, backward, and sideway, over a low obstacle and the time to complete the test is measured (Ibid.). The most accurate way of assessing physical and discriminating the cause of exercise intolerance is maximal cardiopulmonary exercise testing (Casas *et al.,* 2005; Leung *et al.,* 2006). However, the complexity of the equipment, the high operating costs and the need for trained technicians, making its use limited in clinical practice (Cataneo & Cataneo, 2007). Six minute step test is considered a good alternative for assessing exercise capacity (Dal Corso *et al.,* 2007) since it requires only a small room and is portable. It is also a low cost test with better monitoring. The test starts from a standing position and the patients are instructed to step up and down the step at their own pace for 6 minutes). The legs should climb the

step in an alternate manner without the support of their arms, which remained stationary at their sides. The patient performed the tests at a freely chosen cadence. Step up and step down is considered as 1 complete step (Marrara *et al., 2012*)

However, there is little data available in literature in test performance for older adults who are functioning independently among Indian population. Thus the aim of the study was to investigate ageing related changes in balance and functional performance and to determine criterion values depending on age in community dwelling older adults in India.

Method

A sample of 60 community dwelling older adults subjects who were aged between 60 to 89 years were included in the study. The subjects were able to walk independently without the use of an ambulatory aid (cane or walker) and a mini mental state examination (MMSE) score more than or equal to 25 (De Bruin *et al., 2009*) was conducted. They were divided into 3 groups based on their age. (Group 1, 60–69 years, group 2: 70–79 years and group 3, 80–89 years). The source was an urban population in Delhi. Subjects with known neurological disordered were excluded.

Demographic data of the subjects were collected. This includes sex, age, height and weight. Subjects who fulfilled the inclusion criteria were taken for the study. All procedure was adequately explained to the subjects and written consent was taken from each one before starting the test.

Procedure

Six Minute Step Test (6MST)

The 6 minute step test (6MST) was performed on a 20 cm high step, which was 80 cm in length and 30 cm in width with no handles. The objective of this test was to record the number of steps the subject could climb during six minutes. Subject may get exerted, can slow down, stop and even rest in a chair, but resume climbing as soon as he can. Even if the subject stop, the countdown timer was not stopped. (Pessoa *et al., 2014*)

Four Square Step

The Four Square Step required the subjects to rapidly change direction while stepping forward, backward, and sideway, over a low obstacle. The time to complete the test is measured. The square was formed by using four canes of 90 cms each resting flat on the floor. The aim was to observe the step as fast as possible into each square in the following sequence, square number 2, 3, 4, 1, 4, 3, 2 and 1. The score was recorded as the time taken to complete the sequence. Recording was started when the first foot contacted the floor in square 2 and ended when the last foot came back to touch the floor in square 1 (Dite & Temple, 2002).

Data Analysis

Statistical analysis were performed using SPSS Software Version 21. One way analysis of variance (ANOVA) with post-hoc analysis was used to find out the difference among scores of six minute step test, four square step test and demographic data for subjects in all the 3 age groups. An independent t-test was used to analyze the difference between the performance of males and females on six minute step test and four square step test an each group. The significance level of $p = 0.05$ was fixed.

Results

The group wise, age, height and weight of the subjects and result of analysis for difference in age and body parameters is given Table 1. There was significant difference between subjects in terms of age, but not for height and weight between the groups.

Table 1

Demographic Data: Comparison among Group 1
(60–69 years), Group 2 (70–79 years) and Group 3 (80–89 years)

Background Information	Group 1 Mean ± S.D. (n=20) M–10 F–10	Group 2 Mean ±S.D. (n=20) M–10 F–10	Group 3 Mean ± S.D. (n=20) M–10 F–10	F	p
Age (yrs)	63.95 ± 2.50	73.35 ± 2.36	83.35 ± 2.25	333.16	0.001
Height (cm)	157.85 ± 5.16	157.25 ±5.52	158.45 ± 3.54	0.31	0.73
Weight (kg)	63.85 ± 6.25	66.15 ±7.13	62.50 ± 6.87	1.48	0.23

The mean$\pm$ SD of six minute walk test and four square step test for different groups is tabulated in Table 2. It contains the ANOVA and post-hoc analysis results of the tests between the groups. There was significant difference between the groups for six minute walk test and four square step test (p=0.001). In post hoc comparison, there was significant difference between group 1 and 2 (p= 0.001), group 2 and 3(p= 0.04), and group 1 and 3 (p=0.001) in six minute walk test. In four square step test there was only significant difference between group 1 and 3(p= 0.001).

Table 2

Comparison of 6MST, FSST Between Groups (significant at 0.05 level)

Variable	G 1 (N=20)	G 2 (N=20)	G 3(N=20)	AVOVA		Post-hoc		
	Mean ± S.D.	Mean±S.D.	Mean±S.D.	F	P	G_1 V_S G_2	G_2 V_S G_3	G_1 V_S G_3
6MST	101.65±17.07	88.70±18.28	68.40±11.90	21.96	0.001	0.04	0.001	0.001
FSST	16.30±3.56	18.13±1.75	20.04±2.74	8.97	0.001	0.13	0.10	0.001

The gender wise; age, height and weight of the subjects and result of analysis for difference in age and body parameters is given Table 3 and the mean $\pm$ SD, of six minute test and four square step test is given in Table 4. There was no significant difference in age, height and weight between males and females between the groups (Table 3). There was also no significant difference in six minute walk test or four square step test between males and females (Table 4).

Table 3

Comparison between Males and Females of Group 1, 2 and 3 for age, Height and Weight

Groups	Background Information	Males Mean ± S.D	Females Mean ± S.D	t	p
Group 1					
n=20	Age (years)	63.80 ± 2.39	64.10 ± 2.72	0.26	0.79
M=10	Height (cm)	157.60 ±3.97	158.10 ±6.36	0.21	0.83
F=10	Weight (kg)	62.50 ± 7.09	65.20 ± 5.30	0.96	0.34
Group 2					
n=20	Age (years)	72.70 ± 2.21	74.0 ± 2.44	1.24	0.22
M=10	Height (cm)	157.90 ±5.23	156.60 ±6.00	0.58	0.61

Cont'd...

Cont'd...

F = 10	Weight (kg)	67.10 ± 8.78	65.20 ± 5.30	0.58	0.56
Group 3					
n = 20	Age (years)	83.70 ±2.58	83.0 ± 1.94	0.68	0.50
M = 10	Height (cm)	158.30 ±3.79	158.60 ±3.47	0.18	0.85
F = 10	Weight (kg)	63.40 ±7.22	61.60 ±6.76	0.57	0.57

Table 4

Comparison of 6MST, FSST between Males and Females in Different Groups

Variables	Group	Males (N=10) Mean ± S.D	Females (N=10) Mean ± S.D	t	p
6MST	1	100.80 ± 16.96	102.5 ± 18.05	0.21	0.83
	2	93.50 ± 17.82	83.90 ± 18.34	1.18	0.25
	3	73.20 ± 14.95	63.60 ± 4.90	1.92	0.07
FSST	1	16.98 ± 3.72	15.626 ± 3.43	0.84	0.40
	2	17.96 ± 1.97	18.31 ± 1.58	0.43	0.67
	3	19.26 ± 3.14	20.81 ± 2.18	1.28	0.21

Discussion

The six minute step test and four square step test showed a trend towards age related reduction in the test scores. Our study confirmed previous findings of, Steffen *et al.,* 2002, and Steffen *et al.,* 2005, on functional capacity for each of three age cohorts. Performance on the six minute step test depends on the muscular strength, postural balance, general health, nutritional status, orthopedic and cognitive function. Cardiopulmonary fitness and skeletal muscle mass progressively decline in aged population and both factors contribute to weakness and functional disability in elderly. As compared to western population, the nutritional status, muscle strength and general health are comparatively lower in Indian population (Janardhan, 2014). This could be the possible reason for lower values of six minute step test in our study. The differences among studies that evaluate functional capacity are due to the diversity among populations possibly as a result of the different conditions of life such as type of occupational activity, access to health care services, unequal income distribution and educational level (Chen *et al.,* 1994).

Our findings of four square step test scores showed poorer scores with increasing age. There was a progressive increase in the time taken

to complete FSST with age which indicates poor performance in elderly subjects. Due to age related changes, elderly are weaker, slower and less powerful and hence, there is poor performances requiring the regulating and coordinating functions of the nervous system, i.e., balance, reaction time, agility and coordination (Janardhan, 2014) This might be the reason for increase in FSST time.

Maciel and Guerra (2005), found that elderly over the age of 75 years were 6.2 times more likely to have balance deficits when compared to younger individuals (between 60 and 75 years). In a study, conducted with individuals aged 50 years and above, it was observed that elderly individuals aged 80 years or more were 6.99 times more likely to have balance deficits compared to those aged 65–69 years (Stevens, *et al.,* 2008)

Result obtained in our study showed that there is no significant difference between male and female performance on functional capacity (six minute step test) and balance (four square step test) in all the age groups. Thus, indicating gender was not a factor affecting performance on these tests. Similar results were obtained by Steffen *et al.,* (2002), and Steffen *et al.,* (2005), who also reported that gender is not a factor in determining performance on functional capacity and balance test. Chen *et al.,* (1994), also found no age and gender effect on success in stepping over obstacles. Although, some study has shown an association between balance and gender (Maciel and Guerra, 2005). However, a study with elderly individuals showed significant association between sex and balance deficit observed in 46.1 per cent of subjects. The study also showed that females were 3.7 times more likely to have balance deficits when compared to males (Ibid.). Literature reveals better performance of males in the balance test (Daly, *et al.,* 2013).

The main limitations of the study was sample size. However, sample was recruited from one region. It was a cross sectional study. The sample for the age and gender cohorts was too small to serve as definite reference Studies are needed to define the performance level of the community dwelling elders with assertive devices.

Conclusion

It can be concluded that there is a progressive decrease in the physical capacity and balnce performance with age in community

dwelling older people. The findings lead to the point that they need regular exercise programmes to offset the effects of ageing on balance and physical performance.

References

Arfken, C.L., Lach, H.W., Birge, S.J., & Miller, J.P. (1994). The prevalence and correlates of fear of falling in elderly persons living in the community. *American journal of public health*, 84(4), 565–570.

Casas, A., Vilaro, J., Rabinovich, R., Mayer, A., Barbera, J. A., Rodriguez-Roisin, R., & Roca, J. (2005). Encouraged 6-min walking test indicates maximum sustainable exercise in COPD patients. *Chest Journal*, 128(1), 55–61.

Cataneo, D. C., & Cataneo, A. J. M. (2007). Accuracy of the stair climbing test using maximal oxygen uptake as the gold standard. *Jornal Brasileiro de Pneumologia*, 33(2), 128–133.

Chen, H. C., Ashton-Miller, J. A., Alexander, N. B., & Schultz, A. B. (1994). Effects of age and available response time on ability to step over an obstacle. *Journal of gerontology,* 49(5), M227-M233.

Dal Corso, S., Duarte, S. R., Neder, J. A., Malaguti, C., de Fuccio, M. B., de Castro Pereira, C. A., & Nery, L. E. (2007). A step test to assess exercise-related oxygen desaturation in interstitial lung disease. *European Respiratory Journal*, 29(2), 330–336.

Daly, R. M., Rosengren, B. E., Alwis, G., Ahlborg, H. G., Sernbo, I., & Karlsson, M. K. (2013). Gender specific age-related changes in bone density, muscle strength and functional performance in the elderly: a–10 year prospective population-based study. *BMC geriatrics*, 13(1), 1.

De Bruin, E. D., Swanenburg, J., Betschon, E., & Murer, K. (2009). A randomised controlled trial investigating motor skill training as a function of attentional focus in old age. *BMC geriatrics*, 9(1), 15.

Dite, W., & Temple, V. A. (2002). A clinical test of stepping and change of direction to identify multiple falling older adults. *Archives of physical medicine and rehabilitation*, 83(11), 1566–1571.

Hortobágyi, T., Mizelle, C., Beam, S., & DeVita, P. (2003). Old adults perform activities of daily living near their maximal capabilities. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences,* 58(5), M453-M460.

Janardhan, M. P. (2014). Effect of age on test performance in community dwelling elderly people: 6 minutes walk test and ten steps test. *International Journal of Medical Research & Health Sciences*, 3(2), 228–232.

Leung, A. S., Chan, K. K., Sykes, K., & Chan, K. S. (2006). Reliability, validity, and responsiveness of a 2-min walk test to assess exercise capacity of COPD patients. *CHEST Journal*, 130(1), 119–125.

Maciel, A. C. C., & Guerra, R. O. (2005). Prevalência e fatores associados ao déficit de equilíbrio em idosos. *Rev. Bras.* 13(1): 37–44.

Manckoundia, P., Thomas, F., Buatois, S., Guize, L., Jego, B., Aquino, J. P., & Benetos, A. (2008). Impact of clinical, psychological, and social factors on decreased Tinetti test score in community-living elderly subjects: A prospective study with two-year follow-up. *Medical Science Monitor Basic Research*, 14(6), CR316-CR322.

Marcell, T. J. (2003). Review article: sarcopenia: causes, consequences, and preventions. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, 58(10), M911-M916.

Marrara, K. T., Marino, D. M., Jamami, M., Oliveira Junior, A. D. D., & Di Lorenzo, V. A. P. (2012). Responsiveness of the six-minute step test to a physical training program in patients with COPD. *Jornal Brasileiro de Pneumologia*, 38(5), 579–587.

Pessoa, B. V., Arcuri, J. F., Labadessa, I. G., Costa, J. N., Sentanin, A. C., & Di Lorenzo, V. A. P. (2014). Validity of the six-minute step test of free cadence in patients with chronic obstructive pulmonary disease. *Brazilian journal of physical therapy*, 18(3), 228–236.

Steffen, T. M., & Mollinger, L. A. (2005). Age-and Gender-related Test Performance in Community-dwelling Adults. *Journal of Neurologic Physical Therapy*, 29(4), 181–188.

Steffen, T. M., Hacker, T. A., & Mollinger, L. (2002). Age-and gender-related test performance in community-dwelling elderly

people: Six-Minute Walk Test, Berg Balance Scale, Timed Up & Go Test, and gait speeds. *Physical therapy*, 82(2), 128–137.

Stevens, K. N., Lang, I. A., Guralnik, J. M., & Melzer, D. (2008). Epidemiology of balance and dizziness in a national population: findings from the English Longitudinal Study of Ageing. *Age and ageing*, 37(3), 300–305.

Van Velzen, J. M., van Bennekom, C. A., Polomski, W., Slootman, J. R., van der Woude, L. H., & Houdijk, H. (2006). Physical capacity and walking ability after lower limb amputation: a systematic review. *Clinical rehabilitation*, 20(11), 999–1016.

Understanding Hearing Impairment : A Shift towards Measuring Hearing Impairment in Terms of Social and Emotional Functioning

Prakash Babu Kodali[*], Anitha CT[1], and Swarajya Kopparty[2]

School of Health Systems Studies, Tata Institute of Social Sciences, Mumbai–400088

[1.] School Of Medical Sciences, University of Hyderabad, Hyderabad–500046

[2.] Center for Health Psychology, University of Hyderabad, Hyderabad–500046

ABSTRACT

This study was planned to measure hearing impairment of in randomly selected 1,160 individuals of both the sexes (Male = 565 and female = 595) age varying from 20 years to 50 years. These subjects were divided in three groups on the basis of their age (20–30, 31–40 and 41 to 50) to see the age changes in hearing disability. The study also aimed to measure HI in terms of Social and Emotional functioning of these subjects. These Individuals were administered a Hearing Handicap Inventory for Adults (HHIA) to measure hearing impairment and its emotional and social effects. The data was analyzed by using Statistical package for Social Sciences (SPSS) version 21. It was found out that 51.7 per cent of total respondents were females, and 48.3 per cent were males. It was found that Males have a higher prevalence of HI than Females. 84.6 per cent of the total population had no hearing Impairment, where as 13.7 per cent had mild to moderate, 1.7 per cent had significant Hearing Impairment. The total impairment

score obtained by the individuals was divided in to Social Impairment Score and Emotional Impairment Score. Correlation and Multivariate regression analysis was used. Correlation- Age and Social Dimension Score r= 0.609, p=0.01, n=1160, R^2= 0.370; Age and emotional dimension score: r= 0.622, p=0.01, n=1160, R^2= 0.386; Regression-Gender and Social Dimension Score b= 0.703, t (1160) = 2.988, p < 0.05; Age and Total HI score b= 0.787, t (1160) = 27.096, p < 0.01. On the basis of the findings it may be concluded that the Measuring HI in terms of Social and Emotional functioning of individuals is more holistic, and cost effective. In resource poor settings it could be used to measure HI and for Initial screening HI in large scale studies.

Disability in its all forms accounts for one of the most prominent public health challenges faced by countries worldwide. World Health Organization's (WHO) estimates showing the estimated 1,000 million people in the world with some or other form of disability with at least 110 to 190 million facing significant disabilities reflect on the magnitude of the problem (John *et al*., 2014), in the light of global demographic transition and increasing burden of chronic Non Communicable Diseases (NCD's) the magnitude is likely to rise higher. The concerns of this raising prevalence of disability are thought to be high in low and middle income countries (LMIC) with India being no exception, where the magnitude of disability is a significant public health threat. The country's census enumeration (2001) and sample surveys (2002) have shown a repeatedly high prevalence of disability of 2.2 per cent (21.9 million) and 8.4 per cent respectively (SACDIR, 2014). The difference observed between these two surveys is not uncommon and is a general phenomenon, in south-east Asia itself the disability prevalence ranges between 1.5 per cent to 21.3 per cent (World Bank 2015) which can be attributed to the difference in defining disability and it's severity in each country/region (Colin Mathers *et al*., 2000). In India itself variations in defining disability can be seen; Census enumeration uses self-reported information to collect disability related data, and NSSO considers an individual to be disabled if he/she had any of the five types of disabilities, i.e., mental,

visual, hearing, speech and locomotor. It is evident that data from such sources could be severely underestimated as most of the times they miss-out early and moderate levels of disability. Even the legalized definition from persons with disability act defining disability as "person suffering from not less than 40 per cent of disability as certified by medical authority" is considered to be non-holistic and inadequate. This difference and inadequacy in defining disability has called for looking and defining disability from the other side of the coin. Looking into this aspect, and with idea to develop a unique platform to define and measure disability WHO advocated the use of International classification of Functioning and Disability (ICF) as a framework for measuring disability at both the individual level and community level, this ICF approach voiced for shift from the traditional idea of disability as physiological and pathological basis of impairment to more vibrant "social model of disability" where individuals functioning is given more importance, with domains classified from Body, Individual and Societal perspectives.

Considering various dimensions of disability certain forms of disability are focused most often than their counter parts. Example: Disabilities like blindness often receive more attention than the types like speech impairment and Hearing impairment. Hearing impairment though not considered as a serious form of disability possess a serious threat as an emerging public health challenge and accounts for hundreds and thousands of DALYs lost adding up to the global burden of disease. Studies indicate that as the result of growing burden of NCDs the prevalence of hearing impairment (caused due to complications) could raise significantly (AS Kashyap, and S Kashyap; 1999, Luciana *et al.*, 2006). According to 2005 estimates of WHO (2015) 278 million people worldwide has disabling hearing impairment (i.e., >41 db Hearing loss) of which more than 50 per cent is preventable and 30 per cent is manageable, over all showing that 80 per cent of hearing loss is avoidable (WHO, 2003). In India even though it is known that majority of HI is avoidable, the preventive programmes are known to have only limited success which is mainly attributable to the limitation caused by the scarcity of data. Other than the data from census and NSSO any other data which gives proper idea of exact prevalence of HI is not available. Though certain studies tried to

quantify the data, most of them are limited to particular geographical region or occupation and majority of them are more oriented towards traditional physiological/pathological based audiometric analysis which are most of the times neither holistic nor affordable which limits there utilization for the large scale studies (Anupam Mishra *et al.,* 2011).

Most of the times the examination of hearing impairment is limited to audiometric tests (Physical/Physiological dimension) and the functional adversity of hearing impairment (both physical and role functioning) and psychological wellbeing are grossly ignored (Halvik *et al.*, 2006). Moreover there are very minimum/no studies which tried to quantify the prevalence basing on the ICF classification of disability by giving priority to social dimension of hearing impairment thereby, limiting our understanding of application of ICF approach to under-stand the distribution of HI, and its demarcation from that of the traditional physiological/pathological based audiometric idea of HI. In India no studies have properly touched upon the aspects like under-standing HI in terms of physical comfort and other psycho-social aspects of hearing impairment which account for the major functional limitation in this form of disability. In this study taking the account of the dimensions of social and emotional functioning (which are key components of ICF classification), we tried to bridge this knowledge gap by estimating the prevalence of HI, and by quantifying to what extent the factors like gender and age would affect the individual's functional status of HI.

Objectives

- To estimate the prevalence of HI in the sample population using HHIA
- To determine the severity of HI in accordance with age and gender
- To understand the variation in levels of HI between the current study and 2011 census.

Materials and Methods

Study population: the study population is the population of 2 villages in the geographical area of the study. According to 2011 census

the villages have 2,625 households with a total population of 9,478 individuals. The population is normal population with no prior exposure to specific industries/environmental influences which could cause HI.

Sampling: The electoral roll was obtained from the panchyat office and the sampling frame was made by applying inclusion and exclusion criteria. The sampling was done by the means of Systematic random sampling from the obtained sampling frame.

Inclusion Criteria: All the individuals both males and females aged between 20–50 years residing in the study villages were included in the study.

Table 1

Gender of Respondents	Age Groups			
	20–30	*31–40*	*41–50*	*Total*
Male	226	224	115	565
Females	134	241	220	595
Total	360	465	335	1,160

Exclusion Criteria: Individuals who are less than 20 years of age, and More than 50 years of age are not included in the study. Individuals who are not the actual residents of the proposed geographic location, and the migrant population who are not in the electoral roll/government list of the particular villages are not included in the study. People above the age of 50 years are excluded from the study as it was felt that, presbycusis (Age induced hearing impairment) could overestimate the HI prevalence in higher age groups.

Since the age wise distribution of population was not available, considering 61 per cent of age specific distribution according to India's 2011 census, the approximate population is adjusted within the age group (20–50). With 95 per cent Confidence level, 2.5 Confidence Interval, and population 6,495 (adjusted according to 2011 census) Sample size calculated to be 1,243 using an online sample size calcu- lator at http://www.surveysystem.com/sscalc.htm. The Sample was selected randomly from the electoral roll which served as a sampling

frame and was obtained from panchayat offices of the respective villages. Individuals in the electoral roll who does not come under inclusion criteria were excluded from the sampling frame.

Study Design: since the study tries to estimate the prevalence at a single point of time, the study design opted for this study is cross sectional study design.

Questionnaire: Due to the limitation of time to develop, test and validate a questionnaire the study utilized a questionnaire which was already validated as a tool for the data collection. The questionnaire used is Hearing Handicap Inventory for Adults (HHIA). HHIA is a 25 item questionnaire which was developed from the original Hearing Handicap Inventory for Elderly (HHIE) developed by Ventry and Weinstein in 1982. It is divided in to two sub-scales, i.e., a 13 item emotional subscale and 12 item social subscale, and two questions as replacement questions from HHIE focus on occupational effects of hearing loss. The questionnaire is validated and used in multiple numbers of studies by translating it in to various languages where it was proven reliable and valid. The questions are scored to the total of 100, with social and emotional aspects having the sub-total scores of 48 and 52 respectively. Score of "0" denotes "No Handicap" and Score of "100" Indicates "Total Handicap". The scores are weighted as "0–16= No Handicap", "18–42=Mild-Moderate" and "44 and above = Significant HI". The tool was translated in to the local language Telugu and then administered. The questionnaire is freely available on net and no permission to use the tool in the study was obtained.

Data Collection: the Data collection was done from the sample obtained by systematic random sampling from the sampling frame. The total sample which was obtained was 1,160 which was slightly less than that of calculated sample size. For making the data collection easy and quick 5 other individuals belonging to the same geographical area were recruited. All the individuals were adequately trained and well instructed about the study, the questionnaire, and the way to conduct the interviews and are asked to collect the data. Reliability of the data obtained by them was crosschecked by the Researcher at random intervals of time during data collection. The whole data was collected in 20 days' time.

Data Analysis: data was analyzed by using statistical package for social sciences (SPSS) version 20. The data was analyzed by using descriptive statistics, Pearson's correlation and multiple linier regression analysis. The total impairment score is divided in to two components "social dimension score" and "emotional dimension score" which is justified by high correlation of these variables with "total impairment score"(r= 0.978 & r= 0.981 respectively), and the previous studies which were done in similar manner. Pearson's correlation was run between the variables Age of the respondents and "Score for the Social Dimension", "Score for the emotional dimension" and the "Total impairment score" obtained by the respondents.

Multivariate regression analysis was done separately with "the score for social dimension", "the score for emotional dimension" and "The total impairment score" as dependent variables and "the age of the respondents' and "the Gender of the respondent" as independent variables. Since the variable Gender is dichotomous it is recoded into dummy variable and the dummy variable is utilized for the regression analysis.

The Predicted Scores of Multivariate regression analysis are calculated by using the formula

$y = b_0 + b_1x_1 + b_2x_2 + \ldots\ldots + b_nx_n$

where y= value of dependent variable, b_0 is the intercept (Constant in the regression table), b_1, b_2, b_n etc., are the gradient or the slope of the independent variables, and x_1, x_2, x_n are the values of independent variables. The total Impairment score which is a continuous variable was the dependent variable and the variable age and gender were the independent variables. The scores of the social and emotional dimensions are scored separately and are used as independent variables and multivariate linear regression analysis was done with age and gender as independent variables. For variables age groups and gender, regression analysis was done after creating dummy variables for each of the age group and gender separately.

Ethical Approval: The Ethical Approval for the Study was obtained from Institutional Review Board (IRB) of School of Medical Sciences, University of Hyderabad. The Participants of the study were

explained about the study in the language they understood (Telugu) and Informed consent was obtained from the Participants.

Results

Table 2
Table Showing the Composition of Sample with Respect to Gender and Different Age Group

Gender of Respondents	Levels of Impairment			
	No Impairment	Mild Impairment	Significant Impairment	Total
Male	487	78	0	565
Female	494	81	20	595
Total	981	159	20	1,160

Table 3
Table Showing the Distribution of Different Levels of HI According to Gender

Levels of Impairment	Age Groups			
	20–30	31–40	41–50	Total
No Impairment	360	428	193	981
Mild Impairment	0	37	122	159
Significant Impairment	0	0	20	20
Total	360	465	335	1,160

Table 4
Table Showing Distribution of Different levels of HI in accordance with Different Age Groups

	Correlations against each variable			
	Units	Social Dimension Score	Emotional Dimension Score	Total impairment Score
Age of the Respondent	Pearson correlation	0.609	0.622	0.624
	Sig. (2 tailed)	.000	.000	.000
	n	1,160	1,160	1,160

The total sample size was 1,160 individuals out of which 565(48.7%) are males and 595(51.3%) are females (Table 1). The age of the respondents was between 20–50 years with mean age of 34.07 years and standard deviation of 8.645. Graphically the age of the respondents in the sample roughly follows the normal distribution curve. According to the scores obtained by the individuals they are categorized into three categories 1) no impairment, 2) mild-moderate impairment and 3) significant impairment. 981 individuals (84.6%) had no impairment, 159 individuals (13.7%) had mild impairment and 20 individuals (1.7%) had significant impairment (Table 3). It was observed that the number of females in the sample is slightly higher than that of males which was also visualized in the results of impairment levels where 81 females to 78 males had mild impairment and 20 females had significant impairment which none of the males had (Table 2). Considering the age groups and the levels of impairment it was seen that individuals in the age group 20–30 didn't had any kind of hearing impairment whereas individuals in the age group 31–40 years predominantly had mild hearing impairment (n=37) with none having any significant hearing impairment and the individuals in the age group 41–50 years had both mild hearing impairment and significant hearing impairment (n= 122 and 20 respectively) (Table 3).

Correlation Analysis

Table 5

Table Showing the Correlations between Age of the Respondent and Impairment Scores

Variables	Unstandardized Coefficients		Standardized Coefficients	t value	Sig.
	B	Std. Error	Beta		
Constant	−8.833	.510		−17.330	.000
Age of Respondents	.358	.014	.621	26.340	.000
Gender	.703	.235	.070	2.988	.003

Correlation analysis was done between the variables Age of the respondents and Social dimension score. The results yielded statistically significant (p=0.01) positive correlation between the variables age of the respondents (Mean= 34.07, SD= 8.645) and Social dimension Score (Mean=3.72, SD=4.987), r= 0.609, p=0.01, n=1160, R^2= 0.370.

Correlation analysis was done between the variables Age of respondents and Emotional dimension score, the results yielded statistically significant (p=0.01) positive correlation between the variables age of respondents (Mean= 34.07, SD= 8.645) and emotional dimension score (Mean=4.16, SD=5.907), r= 0.622, p=0.01, n=1160, R^2= 0.386.

Correlation analysis was done between the two continuous variables Age of the respondents and the Total Impairment score. The results yielded statistically significant (p=0.01) correlation. There was a positive correlation observed between the variables Age of Respondents (Mean= 34.07, SD= 8.645) and Total Impairment Score (Mean= 7.72, SD=10.785), r= 0.624, p= 0.01, n=1160. R^2= 0.3893 which reflects that around 38.93 per cent of variance is explained and 61.07 per cent of variance is to be explained.

Regression Analysis

Table 6

Showing Results of Regression Analysis with Social Score as Dependent Variable and Age and Gender as Independent Variables

Variables	Unstandardized Coefficients		Standardized Coefficients	t value	Sig.
	B	Std. Error	Beta		
Constant	−10.139	.598		−16.949	.000
Age of Respondents	.423	.016	.619	26.482	.000
Gender	−.217	.276	−.785	−.785	.433

Table 7

Table Showing Regression Analysis with Emotional Score as Dependent Variable and Age and Gender as Independent Variables

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	−19.497	1.089		−17.912	.000
Age of the Respondents	.787	.029	.631	27.096	.000
Gender	.813	.502	.038	1.619	.106

Score for social dimension of HI: The variable age of the respondents significantly predicted the change in the score for the social dimension of hearing impairment. $b = 0.358$, $t(1160) = 26.340$, $p < 0.01$. The variable gender also predicted significant change in the score for social dimension of hearing impairment for which $b = 0.703$, $t(1160) = 2.988$, $p < 0.05$. The intercept $b_0 = -8.833$, $t(1160) = -17.330$, $p < 0.01$. For female with every year increase in age the HI score increases by 0.358 units. Whereas for males the increase is similar with an addition of 0.703 units. *Score for emotional dimension of HI*: The variable age of the respondents significantly predicted the change in the score for the emotional dimension of hearing impairment. $b = 0.423$, $t(1160) = 26.482$, $p < 0.01$. The variable gender predicted the change in score for emotional dimension with $b = -0.217$ but the p value is not significant. The intercept $b_0 = -10.139$, $t(1160) = -16.949$, $p < 0.01$. For a female with every year increase in age the HI score increases by 0.423 units, the increase is similar with males where 0.217 is subtracted from. *Total score for impairment*: the variable age of the respondents significantly predicted the change in the total score for impairment. $b = 0.787$, $t(1160) = 27.096$, $p < 0.01$. The variable gender predicted the change in total score for impairment $b = 0.813$, $t(1160) = 1.619$, but the p value is not significant. The intercept $b_0 = -19.417$, $t(1160) = -17.912$, $p < 0.01$. For a female with every one year increase in age the HI score increases by 0.787, for males the increase is similar with an addition of 0.813 to the product of age and b_1.

Discussion

HI is one of the most neglected forms of disability and the data related to HI is sparsely available. With shifts in understanding disability from the traditional pathology based understanding of impairment to the more holistic ICF classification of disability, there has been an increased need to understand disability from ICF perspective. Several studies were focused towards advocating this shift for understanding HI from social and emotional functioning perspective. The tool used for this study is HHIA which is validated and utilized in several studies earlier and has good correlates with audiometric tests which establish its validity and reliability for its use in this study. This study has its primary focus in understanding the prevalence of disability from ICF point of view and looking at to what

degree does HI is influenced by factors like Age and Gender when looked through the lens of social and emotional functioning.

The sample comprises of 565 males and 595 females, depending on the scores obtained the respondents were categorized in to "No impairment", "Mild-Impairment" and "Significant Impairment". it was observed that overall the females had significant levels of impairment in terms of mild and significant impairment and the number of cases with mild impairment is higher in females. Though it appears to be like this, it could be because of the higher number of females in the older age groups, i.e., 31–40 and 41–50 which are generally expected to have higher prevalence of HI, similarly it was seen that HI prevalence is less in males which could be because of high number of males in the lower age group 21–30 and lesser number of males in higher age group.

Table 3 which talks about distribution of Age groups and hearing impairment shows that the sample in between the age group 20–30 years didn't had any kind of hearing impairment which is evidenced in the table where there are no cases of mild or significant hearing impairment. It shows that the age group 31–40 years had good number of individuals having mild hearing impairment in terms of their social and emotional functioning and there are no individuals with significant HI in this age group. In the age group 41–50 years there are sufficiently good number of individuals having mild hearing impairment and 20 individuals had significant hearing impairment which was "0" in the other two age groups. This table gives us clear evidence how various levels HI are distributed across different age groups with the higher age groups having the significantly higher number of Hearing impaired. These results go in hand with that of the results of other studies which show that the incidence of hearing impairment in a population increases with that of age. Further tests of significance are done to understand how and to what extant age and Impairment score are related.

The total impairment score is the sum of "the social functioning score" and "the emotional functioning" scores. So further the tests like correlation and regression were run with the variables age (independent) and social score, emotional score and total impairment score (dependent). The correlation analysis shows that the variables social score and emotional score are positively correlated with the

variable age. it can be seen that the variable emotional score has a slightly higher positive correlation than that of the variable social score. But, R^2 calculated for all these variables is near to the R^2 of total score showing that about 38 per cent of the variation in the Impairment Score is because of the Age as a factor. To understand the extant of change in the dependent variables with respect to the independent variables regression analysis was done with the same dependent variables and adding gender of the respondents as another independent variable. It was seen that for every unit increase in age the Social Score of HI increased by .358 units and it was seen that for males the increase is 0.703 units higher than females, these variances in social score are statistically significant. It clearly shows that the age and gender had a significant impact on social functioning (i.e., the males having high social impairment scores than females of their respective ages). In the previous results from the descriptive tables it was seen that there are no males who had significant hearing impairment and it was felt that unequal distribution of males and females in accordance with age could be the cause of it. The results of the regression showing that males have 0.703 units more increase in social functioning impairment score than that of females supports the said statement and also clearly indicates the interplay between the gender and social roles and how they could affect the individual's level of HI in terms of his/her social functioning. In terms of emotional functioning it was seen that there was a significant relationship between the age and emotional score of HI which showed that for every one year of increase in age the emotional score of HI would increase by 0.423 units, but in terms of gender as an independent variable in terms of emotional score of HI no significant relationship was established between gender and increasing emotional score. Overall it was observed that the overall total impairment score was significantly influenced by the age of the respondents and with increasing age the respondents had higher chance of being hearing impaired, which is similar with that of the results of normal audiometric tests.

Comparison with other Data Sets: The National wide data related to health and disability is available in the form of Census enumeration and NSSO data. It has been already seen that census 2001 data showed that the prevalence of disability in India to be 2.2 per cent, and NSSO 60th round (2002) has shown the prevalence of disability to be 8.6 per cent. Since the recent data of NSSO focusing on disability are not yet out, we

considered the disability statistics of Census 2011 for this study which used self-reported information as a proxy to diagnosed disability, and is more oriented towards the traditional physiological/pathological idea of impairment. The population of rural Guntur (the district in which the study is done) according to 2011 census is 16,21,491 individuals of which 7,638 are hearing impaired, i.e., according to census 2011 0.47 per cent (Annexure 2) of population of rural Guntur has Hearing Impairment. Contrary, in the present study it can be seen that around 1.7 per cent of the total respondents have significant hearing impairment. Comparing the two results it is evident that there is a 360 per cent increase in HI in the current study results when compared with Census 2011 statistics. The majority of the difference between them could be attributed to the type of classification and the focus of the current study, which mainly tried to quantify the prevalence of hearing impairment by primarily focusing on the non-auditory aspects of social and emotional functioning of the individuals, which are indeed the chief domains of ICF classification. It clearly shows that understanding hearing impairment in terms of social and emotional functioning of the individuals tends to show a greater prevalence of HI than the traditional audiometric tests. The greater degree of increase in between the two views of looking at HI shows that Audiometric analysis most of the time misses out the mild and moderate HI there by resulting in serious under reporting in disability statistics. Comparing the two methods it can be said that the questionnaire method of ICF classification gives us a greater depth in understanding HI by shedding light on the dimensions of social and emotional impairment in terms of HI which are grossly neglected Moreover with minimal complexity and cost effectiveness it can be considered as an initial method of choice for large scale public health programs and research studies, it might also be helpful in assessing the improvement in terms of social and emotional functioning after intervention.

Limitations

Even though the sample is chosen by random sampling method it has its own sampling errors which are common for systemic random sampling. The study took in to consideration only two variables Age and Gender as independent variables. Further, inclusion of variables such as occupation would have explained the variance in greater detail. Geographically the study location is not identical to the whole

state/region and this could be a limitation in its replication in other areas.

Conclusion

Hearing impairment is one of the most prevalent and neglected forms of disability and it's prevalence is high in both rural and urban areas. The situation is bad in terms of those who are at risk of HI due to occupational exposure and even worse in terms of the elderly who are more prone to become HI due to advancing age, the gross negligence shown towards the condition has resulted in its development in to a significant public health problem. The Primitive Methods of classification and identification of disability which are in use in the country are resulting in below the par estimation of disability related statistics depriving many of the Disabled population from the basic services provided by the government. Methods of classifying and defining disability should be changed in accordance with that of the ICF classification to ensure that the disabled are categorized based on their ability to participate and function rather than on being based on physical form of disability. It should be identified that moving towards ICF classification will help us identify the Disability earlier than the normal conventional classification and thus help us to act accordingly by taking measures to act accordingly thereby limiting disability and improving functioning.

References

Anupam Mishra, Veerendra Verma, Girish Kumar Shukla, Subhash Chandra Mishra, Raghav Dwivedi (2011): Prevalence of Hearing Impairement in the District of Lucknow, India, *Indian Journal of Public Health*, Volume 55, Issue 2, April-June,

AS Kashyap, and S Kashyap; (1999): *Increased Prevalence of Impaired Hearing in patients with type 2 diabetes in western India;* Department of Medicine, Armed Forces Medical College; Pune; India; June.

Colin Mathers, Andrew Smith and Marisol Concha, (2000) *Global Burden of Hearing Loss in the year 2000; Global Burden of Disease;* World Health Organization;

Government of India, (2011) *Census* 2011. Percentage distribution of population by broad age groups to total population by sex and residence.

Halvik AS, Jacobson G, Hallberg LR, Psychological Wellbeing of Adults with acquired Hearing Impairment; *Disability and Rehabilitation*; 2006; 28: 535–45

John, Neena; Murthy, GVS; Komal, PreetAllagh; Sagar, Jayanthi;, SureshkumarK; (2014) *Sex Differences in the uptake of health care services in persons with disabilities. Identifying barriers to health care access.* Technical Report. South Asia Centre for Disability Inclusive Development and Research, (SACDIR), Indian Institute of Public Health, Hyderabad, India.

Luciana Lozza de Moraes Marchiori *et al.*, Hypertension as a factor associated with Hearing Loss, Brazilian *Journal of Otorhinolaryngology* 72(4) July/August 2006.

SACDIR, (2014) *Barriers to employment and employability for persons with disabilities in Hyderabad, AP, India*; Study Report; IIPH Hyderabad,

Ventry I, Weinstein B. The hearing handicap inventory for the elderly: a new tool. *Ear Hear* 1982; 3: 128–34

World Bank; Retrieved from http://siteresources.worldbank.org/ SOCIALPROTECTION/Resources/SP-Discussion-papers/Disab ility-DP/1109.pdf, Retrieved on 28/10/2015.

World Health Organization (2015) Fact sheet. Deafness and hearing loss. Available at *http://www.who.int/mediacentre/factsheets/ fs300/en/index.html*

World Health Organization. (2003) State of hearing and ear care in the South East Asia Region. WHO Regional Office for South East Asia. WHO-SEARO. SEA/Deaf/9. Available at *http://www. searo.who.int/LinkFiles/Publica- tions_HEARING_&_EAR_CARE.pdf*

Health Needs of the Elderly in Rural Areas of Lalitpur District in Uttar Pradesh

Tushti Bhardwaj, and Sarla Bhardwaj[1]

Department of Social Work, B.R. Ambedkar College, University of
Delhi, Delhi,
Department of Mathematics, B.R. Ambedkar College, University of
Delhi, Delhi

ABSTRACT

This exploratory study was carried out in one of the village of Lalitpur district in Uttar Pradesh to find out the health needs of the elderly and their satisfaction with existing services. A sample of 80 elderly was selected conveniently with 70 per cent retention rate and interviewed using pre-tested interview schedule giving more space for elderly to speak about their health related issues and existing services. The findings revealed that the Joints pain/arthritis was most common health problems giving elderly movement difficulties. Other issues reported were loss of hearing, vision, forgetfulness, stress, memory loss, blood pressure and breathing difficulty. A very small proportion of elderly in their early 60s did not experience any health problems suggesting increasing health issues with age. Government hospital was the main source of health services and a very big majority reported dissatisfaction owing to long distance, travelling difficulties, and lengthy waiting hours. Absence of recreational centre, nutritional awareness, pension scheme, and health insurance were reported. It may be concluded that in light of unavailability of quality health services and dissatisfaction from existing, this study recommended establishing centres of assisted living and healthy aging offering

*fitness, nutritional, recreational and spiritual programmes empha-
sizing gender and age-sensitive care. Government must initiate
new plans of investment and health insurance for elderly
population in rural areas giving them more power and economic
independence*

Keywords: Elderly, old age, Health needs, Satisfaction, Rural areas

As per 2011 census, elderly constitute 8.57 per cent of the total
population which was only 7 per cent in 2001 census (Registrar
General and Census Commissioner, 2011a) suggesting dramatic
increase of elderly population over the next few decades. A joint
report from United Nations Population Fund and Help Age Interna-
tional projected that current population of Indian elderly (60+) is
expected to increase from 100 million to 300 million by 2050 consti-
tuting 20 per cent of total population (Agencies, 2012,). A large
majority of Indian population, i.e., 72 per cent still live in villages
(Registrar General and Census Commissioner, 2011b) which generally
lack behind in terms of developmental, infrastructure and service
delivery facilities. Health of the older persons is influenced by
poverty, lack of education and social support, thus health needs of the
elderly in rural and urban areas can not remain uniform. In order to
promote good health and well-being of the elderly, it is important to
understand their needs and accessibility of services to the target
population. Thus the present study tried to findout the health needs of
the elderly and their satisfaction with existing services in a village of
Utter Pradesh

Methods

Sample

The present research was carried out from 2014–15 in Banpur
village of Lalitpur district in Uttar Pradesh, NSS camp area of the B.R.
Ambedkar College, Delhi University. According to 2011 census, total
population of Banpur village constituted 13,343. In absence of counted
elderly population of this village the researchers used National
proportion of elderly population, i.e., 8.57 per cent of the total
population to estimate elderly population of Banpur which was

calculated to be 1,143. 114 elderly were initially enrolled in this study using convenient sampling technique. 34 elderly were ill and were not ready to participate in the study were excluded. Only 80 elderly were finally inter interviewed.

Elderly were interviewed using pre-tested interview schedule which included questions on socio-demographic profile, health and nutritional needs, availability of health and welfare services and satisfaction from life.

Data was managed by MS excel and analysed using frequency distribution, percentages and descriptive statistics.

Results

A total of 80 elderly completed the interview; demographic profile of the study participants is presented below which included age, marital status, education, income, socio-economic status and accommodation.

Table 1
Demographic Characteristics

Demographic attribute	No. of respondents	
Age	Male (N = 54)	Female (N = 26)
60–70	37	9
70–80	12	10
80+	5	7
Marital status		
Married	45	21
Unmarried	1	0
Widow/widower	7	5
Divorced	1	0
Total	54	26
Socio-economic status	Housing type	
	Kutcha house	Pucca house
Poor	32	9
Lower middle	11	7
Middle	2	17
High	0	0
Total	45	35

A big majority of participants were male whose highest percentage was between 60–70 years (68.5%) while majority of female were between 70–80 years (38.46%). Respondents were least in 80$^+$ age group but as compared to male, female were high in number. Further, marital status showed that 13 per cent of male lost their spouse while 19 per cent of female were widow suggesting that women are living longer than men. All the respondents were Hindu except two being Muslim. A big majority (46%) of elderly were illiterate, while 20 per cent studied upto primary level, 10 per cent completed secondary education, and only 5 per cent were graduates. More than half the sample (52.5%) had monthly family income less than 5,000 even if they had large sized family suggesting majority of families had poor economic capacity. Socio-economic status was assessed as subjective variable, respondents were asked to identify the category they believe belong to. Majority rated themselves as poor (40%) with *kutcha* house while only 21 per cent felt themselves as better off having *pucca* house and belonging to middle class. Majority of respondents (71.25%) owned the accommodation in their name, and 17.5 per cent of respondents' ownership was in their children name while none of the accommodation was either rented or government allotted. Maximum families (71%) were joint having 3–6 adults and 3–6 children in majority of cases while only 26 per cent of families were nuclear with less than three adults and children each.

Majority of respondents (41%) were not engaged in any occupation, almost half of them were never worked before in their life, this included even those who remained as housewife. Agriculture formed one of the major occupation both in past (52.5%) and at present (36.25%) followed by running their own shop (12.5%). Three respondents were engaged in professional work previously which included headmaster, degree college teacher, and Ayurvedic doctor who was still pursuing his practice while the former two retired. Their work profile suggests that most of the elderly in rural areas were engaged in their own work like agriculture, cattle keeping, shop-owner rather than working for an employer. It was seen that respondents owned more than one asset which included house (78.75%), land (51.25%), animals (46.25%), and vehicle (26.25%). Only

one owned an investment plan while a small proportion 10 per cent of the participants did not own any assets.

Health Issues

In order to understand health conditions of the elderly, they were asked if diagnosed with any health issue or experienced any in their day to day life. In majority of cases, respondents had more than one health issues. Joints pain/arthritis was most common health problems experienced by 56 per cent of respondents, followed by loss of hearing and vision in almost equal number (33.7%). Almost 21 per cent of elderly felt stressed and experienced movement difficulty. This was followed by problem of blood pressure, memory loss and forget-fulness. A small proportion 5 per cent reported to have heart disease and diabetes. In addition to these, one of the respondents shared to experience breathing difficulty. It is interesting to note that almost 12 per cent of respondents did not have any known health problems, all of them were in their early 60s except one in his 80s.

Figure 1
Nature of Health Issues
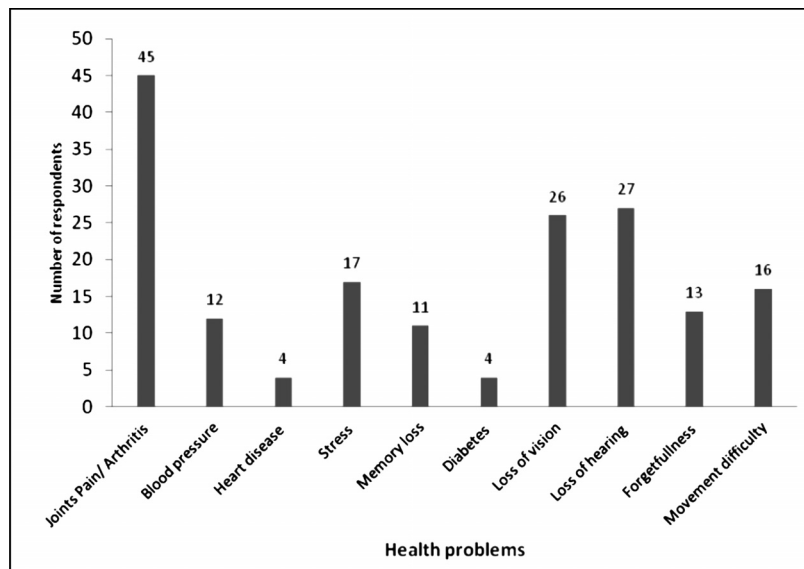
Health Services for Elderly

Respondents were asked about the health services available to them, where they visit in case of illness, their frequency of visiting doctors and what problems do they face in meeting doctors.

Table 2
Health Services, Problems and Satisfaction

Service Indicator	No. of Respondents
Sources of health services	
Govt. Hospital	52
Dispensary	6
Pvt. Nursing homes	6
Locality doctors	8
Vaid/hakim	2
NGO	1
Any other	5
Frequency of visiting doctor	
Once in a week	3
Once in a fortnight	9
Once in a month	11
Once in three months	16
Very rarely	33
Problems in meeting doctor	
Long distance	34
Travelling difficulty	12
Long lines	14
Long hours of wait	9
Impolite nature of medical staff	7
Costly treatment	7
No problems	9
Satisfaction from health	
Poor	6
Fair	14
Good	36
Excellent	18
Complete satisfaction	6

Majority of elderly (65%) visited government hospital in case of any health need, followed by those (10%) visiting locality doctor, while six respondents each preferred to visit dispensary and private nursing home. It is important to note that nursing home was used especially by very old (80+) or those in high paying capacity. Any other source of five respondents also included visit by doctor at patient's home reflecting paying capacity of the family on the one hand and problems in approaching government sources on the other. Problems shared by the respondents in meeting doctors in order of gravity were-long distances reaching to government hospital, travelling difficulty, long queues, long hours of wait for meeting doctors, impolite nature of medical staff and costly treatment especially for those getting treatment from private nursing homes. It is important to note that almost 10 per cent of the respondents experienced no problems in meeting doctors as either they visited private nursing homes, locality doctor, highly educated to negotiate, or private doctor used to make visit to patient's home. When asked if they knew about the nutritional requirements for their age, only 15 responded in positive and 6 chose not to respond. A very large majority (63.75%) expressed lack of knowledge about nutritional requirement. Those knew about the nutritional requirements reported to gain this knowledge either by family, doctors or through self efforts.

Respondents were asked to report their satisfaction from health on a five point scale ranging from Poor (not satisfied) to complete satisfaction. Six respondents each were on both end of the scale, i.e., not being satisfied and having complete satisfaction, while majority of the respondents (36/80) were in the centre of satisfaction scale.

Availability of Social Welfare Services

WHO defined health not just absence of disease but a state of well-being. We believe for individuals' well-being certain levels of welfare services are required and satisfaction from such services is also important. Thus, elderly respondents were asked if they had their identity card, receive ration through PDS, avail transport concession for railway travel as per government's scheme and elderly recreation centre is available to them.

Table 3
Welfare Services for Elderly

Welfare Services	Yes	No
Identity card		
(Aadhar card/voter card/		
ration card)	71	9
Ration		
through PDS	33	47
Transport concession	3	77
Recreation centre	2	72

Data suggests that a big majority (88.75%) of respondents had either Aadhar card, voter ID or ration card, even more than one card in many cases suggesting respondents being well-aware about the importance of these cards in their life. Only 41.25 per cent used to receive ration through PDS but few cases (4 in number) received only oil. This suggests either PDS was not accessible to public at large or people were not interested in getting ration through PDS for a variety of reasons. Only three respondents shared to avail railway transport concession for the elderly people while rest all never used it as either did not require travelling through train or did not know about it. For availability of elderly recreational centre, only two responded affirmatively and they referred to either temple or chaupal (community centre) as their recreational centre while six chose not to respond to it as they could not understand what could be a recreational centre suggesting lack of exposure or awareness which hinders setting up the demand for a service.

Pension Benefit

Respondent were asked if they received pension either from work place, old age pension or any other source. A very big majority (75%) did not receive pension from any source. However 17.5 per cent received old age pension and two received pension from their work place. Those in receipt of old age pension quoted different value of money received in pension, like one each said receiving 100 and 150 respectively while others received 300 per month. People were not

happy with old age pension as it used to get delayed and they faced difficulty in receiving it.

Hobby

Respondents were asked if they had a hobby and how often do they pursue it. Forty nine out of eighty elderly reported to have hobby which included even those eight people for whom hobby was their responsibility like agriculture, farming, looking after children, household, and fulfilling needs of their family. So, in a sense only 50 per cent of elderly reported to have any hobby which included–T.V. watching for religious programmes or match, attending religious gathering, offering prayers, playing cards, singing, interacting with people, newspaper reading, tea drinking or even smoking. Frequency of pursuing these hobbies suggested that majority of respondents were not in a position to pursue their hobby even if they had one owing to being busy looking after grand-children, family responsibilities, or making efforts for earnings.

Decision-making in the Family

Decision-making has been related with empowerment, NPOP emphasized promoting decision-making so that elderly can acquire better control on their lives. We explored participation of elderly in decision-making at the smallest unit of society, i.e., family. Table below presents decision makers for male and female respondents in their family.

Table 4
Decision-making among Elderly

Decision Maker	Male	Female
Self	40	2
Spouse	–	6
Children	12	16
Any other	–	2
All	2	–
Total	54	26

Data shows that a big majority among male had decision-making power themselves while only 2 out of 26 women had so. None of the male had their female partner as decision maker in family while for six women their male partners were decision-making authority. Though children were decision-making authority for 22.2 per cent of male but they used to do it in consultation with their father (i.e., respondent) that too only in those cases where elderly was unable to make movements or bed-ridden. On the other hand for 61.5 per cent of women respondents' children were decision-making authority.

Satisfaction from Life

Respondents were asked to rate the level of their satisfaction from different aspects of their life which included food, clothing, housing, family relations, care extended by family, social interaction and medical care from health services.

Table 5

Satisfaction Level from Varied Aspects of Life

Aspect	Highly Satisfied	Satisfied	Undecided	Dis-satisfied	Highly Dissatisfied
Food	17	40	6	11	1
Clothing	13	37	15	9	1
Housing	11	40	14	7	3
Family relations	29	31	9	5	1
Care by family	35	21	13	3	3
Social interaction	31	28	8	7	1
Medical care	11	27	13	19	1

Data suggests that majority of respondents were satisfied from food (71.25%), clothing (62.5%) and housing (63.75%). Satisfaction from family relations (75%) care by family (70%) and social interaction (73.75%) was rated quite high and only six respondents each reported dissatisfaction from family relations and care extended by them while eight of them were dissatisfied from their social interaction. Medical care was one aspect where 1/4th of the elderly reported dissatisfaction. It is worthy to note that six elderly chose not to respond suggesting they found it difficult to express their satisfaction/dissatisfaction.

When asked who care for them in case of illness, all voted for children especially daughter, wife or family as a whole. It is important to note that none of the female elderly reported husband as their caregiver suggesting care giving as mainly feminine role in rural areas. Only one of the respondent mentioned neighbours as caregivers as he did not have any family.

In order to understand the worries and comfort for elderly in rural areas, respondents were asked to share what worry them most and what give them greatest comfort in their life. Worries of the elderly centred on their declining age, health problems, risk of injury, unavailability of health services and government hospital in village, financial worries, crop failure, stress due to their poor economic condition, marriage of their children especially daughter, children settling down in their career, higher education of grand children, safe drinking water. Two respondents shared that daughters' safety was biggest worry for them while a women shared that being a widow is the biggest worry for her which reflected insecurity for female in the village.

Elderly shared that greatest comfort for them were-being healthy, living with family, caring family, spending time with family and age-mates, children pursuing higher education, marriage of children, availability of good food, and having cemented house. This suggests that health and family were two main indicators to make elderly happy. In addition, basic necessities like good food and house contributed to their happiness and comfort in life.

Discussion

Health and care needs of the elderly as brought out by present research are discussed not only with previous research but also in relation to the provisions of National Policy of Older persons, NPOP (GOI, 1999) in order to examine how far the goals of the policy are met in rural areas. Majority of participants in this study were male suggesting that in rural areas women don't come forward for participation or discussion. Majority of respondents were in 60–70 years of age with male constituting a very high percentage (68.5%), while least representation was from 80+ but female outnumbered men in this group, similar observations were also reported by another study

(Srivastava & Kandpal, 2013) conducted in Deharadun. In our study female had high longevity period and widowhood was higher among female suggesting that women live longer than men. Indian statistics (Gurm, *et al.*, 2014; Registrar General and Census Commissioner, 2011a; World Health Organization, 2015) also reported increasing life expectancy for female which indicates need of gender sensitive health services for elderly in our country. Even though NPOP emphasized investment plans for elderly for their secure future but present research revealed that only one of the respondents owned an investment plan while majority of elderly owned assets in terms of house, land, animals and vehicle. This suggests either the elderly are not aware of the investment plan options or the investments company are not targeting the rural areas.

In our study joint pain and arthritis was most common health problems experienced by 56 per cent of respondents while a previous study (Kamble, *et al.*, 2012) reported only 24 per cent of elderly having problems of osteoarthritis and another study (Singh, 2015) reported 50.98 per cent in rural areas. It is important to note here that we included all those responses where elderly experienced joints pain even if that was medically undiagnosed contributing to relatively higher proportion in our study. Almost 34 per cent of elderly experienced diminishing vision and loss of hearing which they believed were signs of ageing and need no medical help. A study (Kamble *et al.*, 2012) conducted in rural areas of Maharashtra reported 20 per cent cases experiencing loss of vision suggesting a small proportion of elderly in rural areas reports hearing and vision problems. Another study (Thakur, *et al.*, 2013) reported 83 per cent of visual impairment and 63 per cent hearing impairment with no rural-urban difference suggesting health issues of elderly need to be explored further to be more conclusive. Stress and movement difficulties were experienced by almost 21 per cent of respondents. In order to manage their health issues 37.5 per cent of respondents were taking medicine indicating need of medical intervention. Only 15 per cent of the respondents reported to have health insurance though 17.5 per cent never knew about its benefit to them. National Policy of older persons though gave high priority to development of health insurance to cater to the needs of different income segments, but it was seen that rural areas still

have scope for this. National Policy for Older Persons made provisions for old age pension, but in the present study only 17 per cent of respondents received old age pension despite being from poor background and no other income support. It is worthy to note here that even though majority of people living in kutcha house, being poor, having monthly family income less than 5,000 were not in receipt of old age pension which is an empowering provision in NPOP suggesting either lack of awareness or improper implementation of scheme. Similar findings on lack of pension benefit and associated dependency were also reported by another study (Srivastava & Kandpal, 2013). This suggests economic dependency of elderly on their families and improper implementation of provisions of NPOP. Though very high percentage in our study were satisfied from food, clothing, their family relations, but a noticeable percentage were either dissatisfied or undecided. Almost 24 per cent of respondents were not satisfied by the care extended by their family though they were not neglected as against previous study (Ibid.) which reported negligence experienced by 40 per cent of elderly. This suggests need of third party intervention to the elderly people for meeting their basic care needs. One fourth proportion was not satisfied by the medical care provided in their village suggesting scope of improved health facilities.

In order to improve health services in their village and make services more accessible to them elderly respondents extended following suggestions: Hospital need to be approachable having closer proximity, more doctors are required in hospitals, infrastructure improvement in government hospital, transport facilities to the government hospital to make it more accessible, pharmacy and qualified doctors in village to approach in case of any emergency, and regular camps in village. Elderly felt that health care need to be more organised for making services available to them.

Limitations

The present study was based on a small sample selected through non-probability sampling, a large sample selected after sample size calculation would have yield much better results. But since the purpose of this study was not comparison or statistical associations

rather describing the issues experienced by elderly people so even a convenient sample could be a true reflection of the same.

Conclusion

Despite above limitations, the present study brought out important findings with regard to health needs and care issues of the elderly in rural areas. The first decade of old age (60–70 years) does not give problematic health issues but these are found to be aggravated with increasing age. Hearing difficulty and diminishing vision even though experienced by elderly at large but it was not as problematic to them as joint pain or arthritis as it restricted their movement making them dependant on others. In light of unavailability of quality health services in rural areas and dissatisfaction from existing services, this study recommended establishing centres of healthy aging offering fitness, nutritional, recreational and spiritual programmes. This study extends scope of improved and accessible health services of qualified doctors and para-medics in villages providing gender and age-sensitive care. Even though villages are known for joint family system and its inherent support but since a small proportion was not satisfied by the care extended by family so it has implications for a third party offering assistive living services to the elderly adding quality to the last years of life. Government need to initiate new plans of investment and health insurance for elderly population especially in rural areas giving them more power and economic independence in order to fulfil the select goals of National Policy of Older people.

References

Agencies. (2012,). Elderly to constitute 20 per cent of India's population: UN, Indian Express. Retrieved from http://www.indianexpress.com/news/elderly-to-constitute–20—of-indias-population-un/1010339/

GOI. (1999). *National Policy on Older Persons*. New Delhi,: Ministry of Social Justice and Empowerment,.

Gurm, S. K., Deepti, S. S., & Mahajan, S. (2014). A study of socio-psychological aspects of health of elderly in the village

Naagkalan, Threawal block of district Amritsar. *Indian Journal of Basic and Applied Medical research*, 4(1), 384–391.

Kamble, S., Ghodke, Y., Dhumale, G., Avchat, S., & Goyal, R. (2012). Health status of elderly persons in rural area of India. *Indian Medical Gazette*, 295–299.

Registrar General and Census Commissioner. (2011a). *Population in five year age group by residence and sex.* New Delhi,: Census of India Retrieved   from http://www.censusindia.gov.in/2011census/C-series/C–14.html#

Registrar General and Census Commissioner. (2011b). *Single year age returns by residence, sex and literacy* C–13. New Delhi: GOI Retrieved   from http://www.censusindia.gov.in/2011census/population_enumer-ation.html.

Singh, R. (2015). Social Conditions of Elders and Problems. *Journal of Research in Humanities and Social Science*, 3(3), 52–54.

Srivastava, A. K., & Kandpal, S. D. (2013). Social problems and basic unmet need of the elderly: A cross sectional study in rural field practice area of medical college, Dehradun. *Indian Journal of Community Health*, 25(3), 221–225.

Thakur, R., Banerjee, A., & Nikumb, V. (2013). Health Problems Among the Elderly: A Cross. Sectional Study. *Annals of medical and health sciences research,* 3(1), 19–25.

World Health Organization. (2015). Country Profile: India. Retrieved 18/08/2015, from http://www.who.int/countries/ind/en/

Spirituality and Religion: Elderly's Perception and Understanding

Sudeshna Basu Mukherjee

Department of Sociology, University of Calcutta, Kolkata

ABSTRACT

This paper explores through focus group discussion what is meant by spirituality and its attributes as a means of maintaining and connecting with Quality of life/life satisfaction. Locating the perception and thought on religion and spirituality was explored through interview of 200 elderly 100 each from institutional and household setting using purposive sampling. Findings showed that spirituality included a system of beliefs that encompassed love, compassion, and respect for life. It is about relationships with us, others, and a way of living and coping, through religious practices, these elderly navigate life-challenges. Religion was understood as a shared set of beliefs and practices – developed in community, yet conceptualization of spirituality and religion was distinct but overlapping construct.

Keywords: Spirituality, Wellbeing, Quality of Life

In the rapidly changing materialistic society transformation plays a vital role in the ageing process of an individual. For developing countries, the challenge is not ageing per se, but the increased numbers of older persons are important in several spheres of life such as health, social security, living arrangement, relationship building and maintenance, coping with stress and ideas and issues in relation to death and dying. Within the framework of ageing population spirituality and

religiosity are crucial, the piebald genre focusing on dimensions such as well-being predilections and existential actualizations. Spirituality and religion are important constructs in the lives of many elderly (Taylor, *et al.*, 2007). Spiritual beliefs and practices often play a central role in helping older adults navigate life-challenges (Cabassa, 2007; Lawrence *et al.,* 2006). More recently, there has been an expansion of interest to explore how older adults continue to create meaning and live resiliently in a time of increasing frailty, loss, and loneliness along with deaths of contemporaries. Predominantly in the western milieu, there is an epidemic of literature on religion, religiosity and spirituality and the process of ageing (Blazer and Palmore, 1976; Reiser *et al.*, 2005) and on spirituality and self-assessed well-being among older adults (Fischer *et al.,* 2007). Empirical explorations on the ageing-spirituality relations in the local milieu and encouraging correlation on coping with the ageing process and spirituality as established in the western literature has no parallel affirmations in the contemporary indigenous literature on ageing.

From a holistic perspective, spirituality can be viewed as essential or core nature, one domain among the psychological, biological, emotional, and social aspects of a person, and the overarching content of self-surrounding one's being (Canda and Furman, 2010; Carroll, 2001). Spirituality reflects one's deepest sense of worth, meaning, connections with ultimate reality, or the ground of all being (Puchalski *et al.,* 2009; Tillich, 1976). Spiritual expression may include experiences of a transpersonal nature and behaviors such as prayer or meditation in which one finds support and meaning (James, 1902). Spirituality can be depicted as a continuum of spiritual need from spiritual well-being and its association with quality of life. Chakrabarti (2008) had undertaken an empirical study on spirituality and ageing in West Bengal results showed how with the advancement of age, the need for spiritualism increased with variations on account of the background characteristics. Basic human spiritual needs are common to all people, but individuals have the right to choose how they are met to have a fulfilling Quality of life.

Quality of Life

Quality of life (QOL) has become a commonly used end-point in the evaluation of social and public policy. A multi-faceted perspective, with a shift away from approaches which focus only on single domains or areas of life (e.g., health) in many human services sectors. This indicates the subjectivity of the concept suggesting that it reflects the views of the population concerned that is likely to be mediated by cognitive factors (Bowling 2001). There are few empirical data on the extent of relevance or meaning of QOL to people and their everyday lives (Bowling 2001; Rogerson *et al.,* 1989), or on the problems in the domains of QOL.

QOL theoretically encompasses a person's individual characteristics (e.g., physical and mental health, psycho-social wellbeing and functioning, including feelings of independence and control over life) and external circumstances (e.g., socio-economic conditions, work, built environment and social capital). The literature on QOL explicitly suggests that the quality of life (QOL) reflects both macro-societal and socio-demographic influences and the personal characteristics and concerns of individuals. The World Health Organization defined quality of life as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns". Mukherjee (1989) found that aspiration for a better QOL rests upon past experiences and one's current situation. (p. 147). Peoples own evaluations of their lives (Diener and Lucas 2000), either cognitively (e.g., specific or overall life satisfaction) or affective (e.g., feelings of joy) consists of subjective wellbeing or QOL. In the Indian Society, the cultural values and the traditional practices emphasize reciprocity and symbiosis with honour and respect. However, recent changes in the size and structure of families caution against the deteriorating Indian culture that emphasizes the reverential treatment of the aged persons. Very few studies had been conducted to assess the QOL among elderly in India (Barua, 2007; Jacob, *et al.,* 2007). Therefore, there is paucity of information (Kumar, 2014).

Spirituality and Ageing

Spirituality is far more encompassing than religion, though we often see the two used interchangeably. According to Paley (2006) spirituality has become separate from religion only recently and Nolan (2011) suggested that spirituality has become uncoupled from religion. Spirituality incorporates varied reaching attributes, outlooks and practices which emphasis on the exploration for meaning in human lives, particularly in terms of relationships, values and meanings by which people seek to live … (Sheldrake, 2007: p2) and enhance quality of life. (Ferguson, 2011: xxix). Spirituality is thought to include a system of beliefs that encompasses love, compassion and respect for life. Spirituality is the construction of the meaning of one's life, and involves a spiritual identity, which can be religious and or non religious. A variety of research has been conducted assessing spirituality and its impact upon the many components of emotional well-being (Becker, 2001; Grabovac, 2008; Hebert, 2007; Powers, 2007). Spirituality has been defined by Becker (2001) as referring to the soul or the mind and different aspects of human nature that are intangible. O'Reilly (2004) defined spirituality as an expression of the transcendent ways in which human potential is fulfilled. Synonyms such as hope, wholeness, meaning, harmony, and transcending (Ibid.) are associated with the word spirituality. Mohr (2006) defined spirituality as an individual's search for meaning and a belief in a higher power apart from oneself.

Despite 'the inevitable vicissitudes of old age' (Mowatt 2004: 48) contemporary society also provides new opportunities for growth and a sense of relative mental and emotional well-being. On a very different level, religious and spiritual connectedness is increasingly rated as a very important support base for older adults; not necessarily as the traditional refuge in times of need, but also as a source of inspiration for living the later stages of life more fully and contentedly (George, *et al.*, 2000; Levin & Chatters 1998; MacKinlay, 2001; Moberg, 2001). Furthermore, spirituality allows people to transcend their current feelings and circumstances, enabling their well-being to be maintained (Kirby, *et al.*, 2004: 127).

Paradoxically, spirituality as an existential and personal quest rather than the search for a universal truth (Kvale, 1995: 19), for

postmodernists understanding of spirituality relates to subjective personal meaning-making in the deepest dimension of human existence (King, 1998: 96). Despite many explanations it is widely accepted that spirituality, cannot be understood as an idea or concept, but as praxis ... a perennial human concern which entails encounter with self-transcendence (Ibid.: 97). This is reflected in the growing academic literature, that, Spirituality has come to be regarded as an essential feature of institutional/household and palliative care. The spirituality of elderly people stems as much from their cognitive maturity as from their ability for disengagement from the values of competition of life. The theory of disengagement (Cumming, 1963; Cumming and Henry, 1961; Cumming and Newell, 1960), explains this that the elderly people loose interest in and take a distance with the society due to denunciation, marginalization and diminishing status as a senior, to turn to the inner self (Bruyneel *et al.,* 2008). Spiritual development is thus a mechanism which enables elderly people to cope with the losses associated with old age and to defend themselves against age related belligerences (Atchley, 1997; Mattes, 2005; Mc Fadden, 1996).

As regards the spiritual dimension, social thinkers (Ellor, *et al.,* 1990) concur that, the spiritual dimension is the integrator that facilitates the type of comfort with life upon reflection, interpretation of those aspects of life that are less comforting, and provides a sense of a bigger picture (Ibid.). Going by this definition, the spiritual is broader than "the religious" and the religious is an integral part of the spiritual. A caveat that is important to bear in mind is that the spiritual dimension may not be influential for those who deny or are unaware of its existence. Spirituality was an integral and vital element in the lives of individuals is regarded as one of the four components of overall well-being (Mohr, 2006). Spirituality may also play an important part in the identity of an individual. Elderly people often make decisions based upon their religion and may even adhere to certain rules of living founded upon their spiritual beliefs.

Method

Sample

200 graduate elderly people with employed children, living in house hold settings (N = 100) and in old age home (N = 100) of both the sexes were selected randomly from the 4 wards of Kolkata Municipal Corporation.

Tools Used

The subjects were interviewed individually and a focused group discussion was also organized between 20 elderly (belonging to house hold settings N = 10 and old age home N = 10) subjects.

Objectives

1. to find out the living arrangements of these people who were living in their household and in institutional setting.

2. to understand the concept and constructions of spirituality among the elderly living in household settings and in institutional settings through focus group discussion

3. to find out the nature of religious inclinations and spiritual inclinations of the elderly living in household settings and in institutional settings and how far it affected their QOL.

Findings and Discussion

Living arrangement is regarded as a pointer to comprehend the status and the wellbeing of the elderly in the society. The study conducted by Palloni (2001) showed that the living arrangement refers to the familial system. The concept of the living arrangement is usually explained in terms of the type of family in which the elderly live, the authority they enjoy, living arena and with the people, the kind of relationships maintained their kith and kin, and the extent incremental adjustments (Irudaya Rajan *et al.,* 1995). Thus, living arrangement is an important component of the overall well-being of the elderly indicating the level of actual support available to them (Irudaya Rajan, 2003).

Table 1

Living Arrangement of Some Households and Old Age Homes in Kolkata

Living Arrangements	Household (N=100)		Institutional (N=100)	
	Males %	Females %	Males %	Females %
(i) Living alone	28.91	26.0	32.83	26.8
(ii) With Spouse only	19.79	21.1	19.87	18.2
(iii) With Unmarried Children	23.6	21.5	24.6	17.5
(iv) With Married Sons	15.7	19.3	16.8	20.3
(v) With Married Daughters	7.0	5.0	3.4	8.6
(vi) With Other Relatives	4.7	6.6	1.7	8.6
(vii) With Other's Family	0.3	0.5	0.8	0.0
Total	100.0	100.0	100.0	100.0

Table: I, data revealed that a large proportion of the aged persons (i.e., more than two-thirds of the aged persons) both in household settings (Males 28.91% and females 26.0%) were living alone and (Males 32.83% and females 26.8%) lived alone before shifting to Institutional living, (Males 19.79% and females 21.1%) in household settings were living with their spouse only and (Males 19.87% and females 18.2%) in institutional living were living with their spouses only before coming to the Old age home.

Data also highlighted that (Males 23.6% and females 21.5%) in household settings lived with unmarried children and (Males 24.6% and females 17.5%) in institutional living were dependent on their unmarried children and (Males 15.7% and females 19.3%) lived with their married sons, (Males 16.8% and females 20.3%) were living in institutions with hope that their married sons would visit them and take care of their needs (Males 7.0% and females 5.0%) in household settings were living with their married daughters, (Males 3.4% and females 8.6%) were living in institutions because they had only married daughters who were to take care of them.

Hence data highlighted that with the changing lifestyle of fast pace globalized society the young generation are migrating from one city to another city, one country to another as well, or living in accommodations which are too small to accommodate two generations, leading to increase in change in co-residency. As a result of such

demographic changes in the family context, it can no longer be assumed that the elderly live comfortably at home receive familial care. Thus, the society is witnessing a gradual but definite withering of the co residing family system as a result, primarily the elderly, are exposed to somewhat emotional neglect and a lack of physical support leading to environmental conditions of poor Quality of life.

Having observed the altering living arrangements of these elderly a focus group discussion was arranged were 20 elderly (10 each [5women and 5 men]) from both the household and institutional set ups participated and the outcomes were very similar to world perspective on the same area.

One can explore spirituality and nurture it in contrast to religion, which is about the Gods and Goddesses (akar/nirakar), the rites, the beliefs and doctrines, spirituality is about that private journey of finding eventual meaning in an assimilation of the fragmented aspects of our lives. Spirituality is something profoundly private, accepting to let go, be, and come with love, patience, self-control, and accepting life as it comes. Having set these as parameters for aging and spirituality, the following attributes of spirituality as they evolved in the process of the focus group discussion:

Findings of Focused Group Discussions

For most of the elderly participating in the Focus Group discussion of the study, religion had a major role in their life:

- 96 per cent believed in God or a universal spirit.
- > 90 per cent pray regularly.
- > 60 per cent attend religious services weekly or more often.
- > 65 per cent promise offerings for some wish fulfillment.
- >47 per cent female and 39% males
- > 49 per cent Co-religious brethren/ community was the largest source of social support outside of the family, and
- > 68 per cent participation in religious activity was most common and voluntary social activity.

While integrating spiritual issues and needs and discussing an individual's spiritual practice some overwhelmingly benefits of the attributes of spirituality were revealed,

The findings of focus group discussions yielded and corroborated numerous suggestions available in the literature, such as spirituality was interpreted differently by individuals and it does not only apply to religious persons but to every individual. For elderly ruptured inter-personal relationship with family and others was often a core factor causing spiritual distress that the individual is unable to invest life with meaning. The main conclusions drawn from this focus group discussion was that spirituality was important to elderly regardless of their religious affiliations and gender.

The following are the constituents of spirituality according to the elderly participants of focused group discussion :*Forgiveness, Locating Meaning, Repentances , Gratitude.*

Forgiveness : Forgiveness for self and others is about the choice of staying acrimonious or getting healthier because it is self-healing and letting go past ire, it can also be mutual forgiveness. When we forgive, we self-heal and let go annoyance, the embarrassment and move on.

Locating Meaning : These elderly subjects revealed that the dignity is related to having meaning in their lives. In the younger years the meaning they sought was primarily identity/ prestige and success. Before retirement/ageing (60+) years, it seldom seemed that there was enough time, were always busy and even prayers were squeezed in midst all other activities. They had a good sense of who they were because in those days, they were what they did, what they really believed and thought, their self of ego and hubris. While now in the winter of their lives they are challenged to come home to self. A good check-in for them is that each of them should try to know the true self and minimise constant living in the past for selective memories.

Repentances: Each of them was well aware of the repentances in their lives, and perhaps they consciously kept themselves busy, so that they didn't have to think. According to them spirituality was all about integration and transformations needed. The task before them was allowing the regrets to surface but look at them with the experience and wisdom of years. Consequently regret had two aspects, regret about life selections and failures.No one was immune to the ups and

downs of life and which one of us has not said if we knew then what we know now, we could have avoided certain of our mistakes and failures? However, that is what the experience of life teaches and is the crux of wisdom, letting mistakes and failures go and moving on.

*Gratitude :*Knowledge of gratitude is grace, gift and process. For most of their lives, they didn't feel they were enough, they didn't do enough, they became dissatisfied and their fears and regrets multiplied. Now they should have gratitude that involves satisfaction with life, with oneself, with one's religious congregation and with the world.

For spiritual pursuits loneliness is essential so that they can withstand the silence and stillness and over time, transform it into solitude. It becomes a matter of being comfortable with our own company and rather covering it with different escapes, such as addictions of Information and communication technology: net surfing, doing Facebook, texting, talking on mobile phones, skyping than sitting back brooding over what is left behind unachieved and incomplete. It is all possible only an individual has leisure- a mental and spiritual attitude. This attitude allows non-activity, inward calm, and silence. Leisure meant not being busy but letting things happen. Leisure was letting oneself go, is about becoming whole as a human being, becoming integrated. It was finding time for oneself which was rare earlier when they were young especially for women who were always busy with the household chores.

Religion and spirituality were related but not same for these elderly. Religion was viewed as more utilitarian, more organized, and more traditional and associated with premeditated, well-established beliefs and practices such as fasting, doing puja, doing 'jap' adhering to the different 'parbons' such as 'sasti', 'ekadasi', etc. Spirituality referred to the elusive and non-material and thus was a more universal expression not associated with any specific group or religious union. It referred to outlooks, beliefs, understandings, and activities related to the search that typically involves a search for meaning in life. Traditional religion involved responsibility and obligation; spirituality did not have any obligatory requirements. It was evident that the elderly tended to connect spirituality with religion, (Moberg, 2008, p. 101).

There was abundant evidence that spirituality and religious participation are associated with improved emotional wellbeing.

(Markides, *et al.,* 1987) Intrinsically religious people internalize their faith, and have higher self-esteem, better personality functioning, less paranoia and lower rates of depression or anxiety, while extrinsically religious people use religion to obtain status, security, sociability or health (Koenig, 1997; Richards and Bergin, 1997).

Table 2
Showing Religious Inclinations among Elderly

Religious Inclinations	Household (N=100)%	Institutional (N=100)%
Faith in God		
(i) Yes	65	87
(ii) No	35	33
Are you Devoted to God (any particular cult)		
(i) Yes	36	76
(ii) No	64	24
When in Dilemma resort to praying		
(i) Yes	44	78
(ii) No	56	22
Do you Pray everyday		
(i) Yes	75	89
(ii) No	25	11
Do prayer helps you to overcome anxiety		
(i) Yes	43	90
(ii) No	57	10
Do religious rites and rituals plays significant role in your life		
(i) Yes	53	69
(ii) No	47	31
Do you believe that whatever you are, because of God		
(i) Yes	35	59
(ii) No	65	41

Data in Table 2 highlighted that elderly from both the household and institutional set ups revealed inclination towards being religious, believing in God and finding it functionally viable as religion was an organized system of beliefs, practices, rituals, and symbols designed (a) to facilitate closeness to the sacred or superior power (God, higher

power, or ultimate truth/reality) and (b) to nurture an understanding of interpersonal relationship and responsibility to others living together in a community (MacKinlay, 2006, p. 13). Data corroborated what Moberg (2008) suggested that religiosity was "the membership and participation in the organisational structures, beliefs, rituals, and other activities related to a religious faith like Judaism, Hinduism, Islam or Christianity." The multi-dimensional extent of religion included affiliation, attendance rituals and symbols and subjective religiosity as was understood from the focus group discussion too.

Table 3
Showing Spiritual Inclinations Among Elderly

Spiritual Inclinations	Household (N=100)%	Institutional (N=100)%
Do you understand yourself and can absorb the changing life style		
(i) Yes	76	36
(ii) No	24	64
Do you feel that you are a responsible person?		
(i) Yes	88	26
(ii) No	12	74
Do you feel that you are a open minded person (who accept life as it comes)		
(i) Yes	61	35
(ii) No	39	65
Do you think that you have tolerance capacity (e.g., situation a special day and no one remembers it.)		
(i) Yes	65	26
(ii) No	35	74
Do you easily forgive people?		
(i) Yes	41	45
(ii) No	27	13
(iii) No other way out	32	42
Do you have patience?		
(i) Yes	48	36
(ii) No	12	16
(iii) No option	40	48

Cont'd...

Cont'd...

Do you believe in ultimate power		
(i) Yes	92	97
(ii) No	8	3
Do you believe that serving people is serving God		
(i) Yes	22	18
(ii) No	46	44
(iii) Don't know	32	38
Does reading religious books or autobiography of great people helps you to overcome anxiousness		
(i) Yes	62	30
(ii) No	38	70

Data from both the household set ups in Table 3 revealed that elderly today are very understanding and adaptable to change in cultural norms, are tolerant, hence forgiving, they believe in an ultimate power. These elderly have integrated all aspects of life as a medium of coping with harsh reality of incremental change physical, psychological, material, and in other aspects of human existence. On the other hand data in Table 3 showed the elderly who could not accept and absorb the changes forgave and went way to live away from family. Interest in spirituality and aging has increased recently, owing to overwhelming evidence of positive health outcomes linked to spirituality and religious participation. Spiritual practices can change one's attitude toward death and dying.

Conclusion

By and large, this study indicated that religio-spirituality was an effective thread in the integrative process in old age and that it had beneficial effects on adjustment to physical, social, and existential aging. For the respondents, religio-spirituality was an overarching theme over their experiences across all domains of life. It is an integrator in later life giving them a sense of importance, security, belongingness, identity, and continuity, furnished with strength, peace, comfort, hope, purpose, and wholeness (Xu and Mehta, 2003). At this point in life besieged and challenged with vicissitudes and fatalities, handling the existential concerns, adjusting to corporal and social decrements impending death, the inevitable, the elderly need to make

sense of their lives. In this regard, religio-spirituality they believed provided a why and a framework of meaning which enabled the elderly to mien on old age as a successful and progressive phase of growth rather than torpor, with hopefulness rather than anxiety, and meaningfulness rather than pointlessness was indicated by this study.

Overall, in this study, religio-spirituality tended to have positive effects on late-life well-being focused on existential concerns that allow old age to possess its own meaning and character (Martin, *et al.,* 2014). As Kimble (1995,) has put it, "it is the whole person who is ageing and aged. This wholeness is a blend of spiritual, physical, mental, emotional, and social dimensions of human growth and development." This prompts that understanding the elderly needs to include religious and spiritual aspects of experience. All the elderly people in the study accepted the significance of spirituality in their lives, and its relationship with old age, and how their capacity to bear the inherent processes such as precincts, losses and difficulties involved was gratified.

References

Atchley, R. (1997). Everyday mysticism: Spiritual Development in Later Adulthood, *Journal of Adult Development*, 4, 123–134. Belgique.

Barua A, Mangesh R, Kumar Harsha H.N., Mathew S. (2007). A cross-sectional study on quality of life in geriatric population. *Indian J Community Med*; 32:146–7.

Becker, D. M. (2001). Public Health Religion. In N. Schneiderman, *et al.,* (eds). Integrating behavioral and social sciences with public health. Washington D.C. American Psychological Association.

Bickerstaff, K., Grasser, C. and McCabe, B. (2003), 'How elderly nursing home residents transcend losses of later life', *Holistic Nursing Practice*, Vol. 17, No. 3, p. 159–165.

Blazer, D. and E. Palmore, (1976). 'Religion and aging in a longitudinal panel', *The Gerontologist* 16, pp. 82–85.

Bowling, A. (2001). *Measuring Disease: A Review of Disease Specific Quality of Life Measurement Scales*. Second edition, Open University Press, Maidenhead, Berkshire.

Cabassa, L.J. (2007). Latino immigrant men's perceptions of depression and attitudes toward help seeking. *Hispanic Journal of Behavioral Sciences, 29*(4), 492–509.

Canda, E. R., & Furman, L. D. (2010). *Spiritual diversity in social work practice: The heart of helping*. New York, NY: Oxford University Press.

Carroll, M.M. (2001) 'Conceptual models of spirituality', in E. R. Canda and E. D. Smith (eds.), *Transpersonal Perspectives on Spirituality in Social Work* (pp. 5–21). Binghamton, NY: Haworth Press. Co-published simultaneously in Social Thought, 20(1/2), 5–21.

Chakrabarti, Prafulla (2008). An Empirical study of Spirituality and ageing in rural West Bengal. http://www.nndccomputercentre.com/research-works/gerentology/session–3-empirical-study/accessed on 08.03.15/at 11.30pm.

Charles, R. (2004), *Intuition in Psychotherapy and Counselling*, Whurr Publishers, London.

Cumming, E. and Newell, D.S. (1960). Disengagement: a tentative theory of aging, Sociometry, 23, 23–24. NY: Basic Books.

Cumming, E. and Henry, W. (1961). Growing old: the process of disengagement, NY

Cumming, E. (1963). Further thoughts on the theory of disengagement, UNESCO International Science Journal, 15, 377–393.

Derezotes, D. S. (2006). Spiritually oriented social work practice. Boston: Pearson.

Diener E. and Lucas RE. (2000). Subjective emotional well being. In: M. Lewis and JM Haviland (eds). *Handbook of emotions*. 2nd ed. New York: Guilford.

Ellor, J. W., Thibault, J. M., Netting, F. E., & Carey, C. B. (1990). Wholistic theology as a conceptual foundation for services for the oldest old. In J. J. Seeber (ed.), Spiritual maturity in the later years (pp. 99–109). New York: Haworth Press.

Ferguson R (2011). *George Mackay Brown: the wound and the gift,* Edinburgh: St Andrew Press

Fischer, R.S., Nygren, B., Lundman, B. And Noberg, A. (2007) Living amidst consolation in the presence of God – Perceptions of Consolation Among Oldest Old: The UMEA 85+ study, 19 (3), *Journal of Religion, Spirituality and Ageing*, pp 3 – 20.

Flynn, Thomas, (2013). "Jean-Paul Sartre", *The Stanford Encyclopedia of Philosophy* (Fall 2013 Edition), Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/archives/fall2013/entries/sartre/>.

George, L., Larson, D., Koenig, H. and McCullough, M. (2000). 'Spirituality and Health: What we know, what we need to know', *Journal of Social and Clinical Psychology*, Vol. 19, No. 1, pp. 102–116.

Grabovac, A., Clark, N., & McKenna, M. (2008). Pilot study and evaluation of postgraduate course on "The interface between spirituality, religion and psychiatry." *Academic Psychiatry, 32*(4), 332–337.

Grant, D. (2004). 'Spiritual Interventions: How, When, and Why Nurses Use Them', *Holistic Nursing Practice*, Vol. 18, No. 1, pp. 36–41.

Hammermeister, J., Flint, M., El-Alayli, A., Ridnour, H., & Peterson, M. (2005). Gender differences in spiritual well-being: Are females more spiritually-well than males? American Journal of Health Studies, 20(2), 80–84.

Hays, T. and Minichiello, V. (2005). 'Older People, Music and the Experience of Spiritual Self: Results of a Qualitative Study', *Journal of Religion, Spirituality and Aging*, Vol. 18, No. 1, pp. 261–279.

Hebert, R. S., Dang, Q., & Schulz, R. (2007). Religious beliefs and practices are associated with better mental health in family caregivers of patients with dementia: Findings from the REACH study. *American Journal of Geriatric Psychiatry, 15*(4), 292–300.

Irudaya, Rajan, S, U S Mishra and P S Sarma (1995). 'living Arrangement among the Indian Elderly', Honkong Journal of Gerontology, Vol. 9, No 2, pp 20–28.

Jacob ME, Abraham VJ, Abraham S, Jacob KS.(2007). The effect of community based daycare on mental health and quality of life of elderly in rural south India: a community intervention study. *Int J Geriatric Psychiatry*; 22:445–7. [PubMed]

James, W. (1902). *'The Varieties of Religious Experience: A Study in Human Nature'*, The Gifford Lectures on Natural Religion delivered at Edinburgh in 1901–1902. New York: Modern Library.

Kallelis, Peter M. (2005). *Five Steps to Spiritual Growth.* Paulist Press.

Kimble, M. A. (1995). Pastoral care. In M. A. Kimble, S. H. McFadden, J. W. Ellor, & J. J. Seeber (eds), Aging, spirituality, and religion: A handbook (pp. 131–147). Minneapolis, MN: Fortress Press.

King, U. (1998). 'Introduction', in *Faith and Praxis in a Postmodern Age*, ed. U. King, Chassell, New York.

Kirby, S., Coleman, P. and Daley, D. 2004. 'Spirituality and Well-Being in Frail and Nonfrail Older Adults', *The Journals of Gerontology*, Vol. 59B, No. 3, p. 123–129.

Koenig HG. (1997). *Is Religion Good for Your Health? The Effects of Religion on the Physical and Mental Health.* The Haworth Press, NY, USA.

Kumar, S. Ganesh, Majumdar Anindo, Pavithra G. (2014). Quality of Life (QOL) and Its Associated Factors Using WHOQOL-BREF Among Elderly in Urban Puducherry, India; *Journal of Clinical and Diagnostic Research*. Jan, Vol–8(1): 54–57. Published online 2014 January.

Kvale, S. (1995). 'Themes of Postmodernity', in *The Truth about the Truth*, ed. W. Truett Anderson, Jeremy P. Tarcher/Penquin, New York, pp. 18–25.

Lawrence, V., Banerjee, S., Bhugra, D., Sangha, K., Turner, S., & Murray, J. (2006). Coping with depression in later life: A qualitative study of help-seeking in three ethnic groups. *Psychological Medicine, 36,* 1375–1383.

Levin, J. and Chatters, L. (1998). 'Religion, Health and Psychological Well-Being in Older Adults', *Journal of Aging and Health*, Vol. 10, No. 4, pp. 504–531.

MacKinlay, E.(2001). 'Understanding the Ageing Process: A Developmental Perspective of the Psychosocial and Spiritual Dimensions', in *Aging, Spirituality and Pastoral Care: A Multi-National Perspective,* eds. E. MacKinlay, J. Ellor and S. Pickard, The Hawthorn Pastoral Press, New York.

MacKinlay, E., (2006). *Spiritual Growth and Care in the Fourth Age of Life.* London, GBR: Jessica Kingsley Publishers.

Markides KS, Levin JS, and Ray LA. (1987). Religion, aging, and life satisfaction: an eight-year, three-wave longitudinal study. *Gerontologist* 27, 660–665.

Martin, Peter, Kelly, Norene, Kahana, Boaz, Kahana, Eva, Bradley J. Willcox, D. Willcox, Craig, and Poon, Leonard W. (2014). Defining Successful Aging: A Tangible or Elusive Concept? The Gerontologist, 2014, Vol. 00, No. 00; Special Issue: Successful Aging.

Mattes, R. (2005). Spiritual need one: the aging process: a journey of lifelong spiritual formation, *Journal of Religion, Spirituality and Aging*, 17, 3–4, Special issue: ministering to older adults: the building blocks, 55–72.

McFadden, S.H. (1996). Religion, spirituality and aging. In J.E. Birren and K.W. McGrath, P. and Clarke, H. 2003, 'Creating the space for spiritual talk: Insights from survivors of haematological malignancies', *Australian Health Review*, Vol. 26, No. 3, pp. 116–132.

Milligan, S. (2004). 'Perceptions of spiritual care among nurses undertaking post registration education', *International Journal of Palliative Nursing*, Vol. 10, No. 4, pp. 162–171.

Moberg, D. O. (2001). Religion/spirituality: From tolerant disdain to enlightened respect (book review essay). *The Gerontologist*, 41(5), 698–703.

Moberg, D. O.,(2008). Spirituality and Aging: Research and Implications. *Journal of Religion, Spirituality & Aging*, 20(1–2), pp. 95–134.

Mohr, W. K. (2006). Spiritual issues in psychiatric care. *Perspectives in Psychiatric Care, 42*(3), 174–183.

Mowatt, H. (2004). 'Successful Ageing and the Spiritual Journey', in *Ageing, Spirituality and Well-being*, ed. A. Jewell, Jessica Kingsley Publishers, London.

Mukherjee R. (1989). *The Quality of Life: Validation in Social Research*. London: Sage.

Nolan S (2011) Psycho-spiritual care: New content for old concepts – towards a new paradigm for nonreligious spiritual care, *Journal for the Study of Spirituality*, 1 (1), 50–64

O'Reilly, M. L. (2004). Spirituality and mental health clients. *Journal of Psychosocial Nursing and Mental Health Services, 42*(7), 44–53.

Paley J (2006) Spirituality and secularisation: Nursing and the sociology of religion, *Journal of Clinical Nursing,* 17, 175–186.

Palloni, A (2001): *'Living Arrangements of Older Persons'.* United Nations Population Bulletin, Special Issue Nos 42/43, Department of Economic and Social Affairs, Population Division, New York.

Powers, D. V., Cramer, R. J., &Grubka, J. M. (2007). Spirituality, life stress and affective well-being. *Journal of Psychology and Theology, 35*(3), 235–244.

Puchalski, C., Ferrel, B., Virani, R., Otis-Green, S., Baird, P., Bull, J. Chochinov, H., Handzo, G., Nelson-Becker, H., PrincePaul, J., Pugliese, K. and Sulmasy, D. (2009). 'Improving the quality of spiritual care as a dimension of palliative care: The report of the consensus conference', *Journal of Palliative Medicine*, 12(10), 885–904.

Reiser, D., Brennan, M. and Redic II, L.J. (2005). Spirituality and Palliative Care: The CARE Cabinet Intervention, *Journal of Religion, Spirituality and Ageing*, 17 (1), pp 131 – 149.

Richards PS, Bergin AE. (1997). *A Spiritual Strategy for Counseling and Psychotherapy*. American Psychological Association Press, Washington, DC, USA.

Rogerson RJ, Findlay AM, Coombes MG and Morris A. (1989). Indicators of quality of life. *Environment and Planning*, 21, 1655–1666.

Salmon, D. (2001), 'Music therapy as psycho spiritual process in palliative care', *Journal of Palliative Care*, Vol. 17, No. 3, pp. 142–148.

Sheldrake P (2007). *A brief history of spirituality,* Oxford: Blackwell Publishing

Taylor, B. (2000). *The reflective practice: A guide for nurses and midwives*, Allen and

Taylor, R. J., Chatters, L. M., & Jackson, J. S. (2007). Religious and spiritual involvement among older African Americans, Caribbean Blacks, and non-Hispanic Whites: Findings from the National Survey of American Life. *Journal of Gerontology, 62B* (4), S238-S250.

Tillich, P. (1976). *The Future of Religions*. Westport, Ct: Greenwood Press.

Effects of BMI and Gender on Falls of Elderly Individuals: Assessed by Time up and Go Test

Aparna Sarkar and Tushar Bansal

Amity Institute of Physiotherapy, Amity University, Noida–201303,

ABSTRACT

The aim of this study was to compare the falls between non-obese and obese elderly individuals by using time up and go test and to find out gender differences in falls of obese elderly individuals. Forty subjects of both the sexes of age varying from 60 years to 75 years were selected from an Old age home, Delhi on the basis of their BMI scores. They were classified as obese and non-obese. BMI of each subjects were calculated and assigned into obese and non-obese groups irrespective of gender. The results indicated that significant difference lie in TUG between obese and non obese male (p < 0.001) as well as obese and non obese female (p < 0.001). It was observed that when TUG was evaluated between non-obese male and female, it was insignificant (p > 0.05) as well as for obese male and female (p > 0.05). It is concluded that TUG task time was not significant between non-obese male and female as well as obese male and female, but it was highly significant in non-obese and obese male as well as non-obese and obese female which indicated that obese elderly individuals were more prone to the risk of fall in comparison to non-obese elderly individuals. It was also found that gender did not have any influence on TUG task time for both non-obese and obese elderly individuals.

Keywords: BMI, Gender, Fall, Elderly, Balance, TUG Test

Obesity is a risk factor for functional decline in older persons of either gender (Jensen and Friedmann (2002). Obesity increases the likelihood on various diseases, particularly heart disease, type 2 diabetes, breathing difficulties during sleep, certain types of cancer, and osteoarthritis (Jeakins, 2004). A fall is defined as any occasion in which an individual finds themselves unintentionally on the floor, ground, or other lower surface, regardless of whether an injury is sustained. Around 30 per cent of those aged 65 and over fall each year (Tinetti, *et al.,* 1988 and Blake, *et al.,* 1988), rising to over 40 per cent in those aged over 80 years (AGS, 2001). Falls are responsible for two-thirds of all unintentional injury deaths in older adults (Baker and Harvey, 1985; Moreland *et al.,* 2003). Fear of falling affects confidence in performing daily activities, causing self-limitation and a less active lifestyle (Maki, 1991). This results in muscle atrophy and loss of strength, especially in the lower extremities, which exacerbates the risk of falls (Wolfson, 1995).

It was examined that potential gender differences in the relationship between body mass index (BMI) and functional decline. A general conclusion is that women had a higher prevalence of reported functional decline than men at the upper range of BMI categories (31.4% vs 14.3% for BMI =40). Women and men exhibited increased risk for any functional decline at BMI of 35 or greater. Weight loss of 10 pounds and weight gain of 20 pounds were also risk factors for any functional decline. KR Jeakins (2004) described two purposes: first, if there is a relationship between body weight and the onset of functional impairment across time among sample of older adults. Second, how health behaviors and health conditions may explain the relationship between body weight and the onset of functional impairment. He indicated that body weight (more specifically being overweight or obese) makes one more likely to experience the onset of functional impairment across various domains of impairment. Outside of health behaviors and health conditions, obesity has an independent effect on the onset of impairment in strength, lower body mobility, and activities of daily living (Jeakins, 2004). Tinetti, *et al.,* (1988) had concluded that falls among older persons living in the community are common and that a simple clinical assessment can identify the elderly persons who are at the greatest risk of falling. Discriminate analysis of

selected medical and anthropometric variables indicated that handgrip strength in the dominant hand and reported symptoms of arthritis, giddiness and foot difficulties were most influential in predicting reports of recent falls (Blake, *et al.,* 1988).

American Geriatrics Society, British Geriatrics Society stated that the risk of falling and sustaining an injury as the result of a fall increases with age. Falls are not only associated with morbidity and mortality in the older population, but are also linked to poorer overall functioning and early admission to long-term care facilities. For older community residents, effective fall prevention has the potential to reduce serious fall-related injuries, emergency department visits, hospitalizations, nursing home placements, and functional decline. Reducing fall risk in older individuals is therefore an important public health objective (AGS, 2001). The patterns of reduction of injury and mortality in the past two decades are likely to have been the result of our medical and trauma care system's impact on the outcome of less severe injuries (Baker, *et al.,* 1985).

Balance exercises are recommended for all individuals who have had a fall and there is evidence for a program of home physiotherapy for women over 80 years of age, regardless of risk factor status. For institutional settings, the establishment of a falls program for safety checks, ongoing staff education and monitoring is substantiated by research. Residents who have fallen need to be assessed for specific risk factors and clinical indicators to determine relevant management options (Moreland, 2003). Maki *et al.* (1991) performed a cross-sectional study to investigate the association between fear of falling and postural performance in the elderly and found that there was a significant association with retrospective, self-reported falling history. Authors indicated a strong relationship of lower extremity strength to balance and gait and demonstrated an association between these functions and the occurrence of falls (Wolfson, 1995). The authors described the fall and near-fall history, location, circumstances and injuries from falls in a community-dwelling population of adults over aged 65 with hip osteoarthritis and to determine the ability of the timed up and go test (TUG) to classify fallers and near-fallers (Catherine, 2007).

These iInvestigators stated that the high risk of falling and the recognition that falling is a "geriatric syndrome". Screening for risk of falls has become popular at community health fairs. The authors stated that the health fair screening and educational intervention would result in behaviors that could reduce the risk of falls and to determine whether adoption of risk-reduction behaviors differed between people over age 65 years screened as being at high risk for falls and those screened as being at lower risk for falls (Kirsten, 2003). Cheryl *et al.* (2006) stated that falls are a major health concern for older adults and their impact is a significant public health problem. The chief modifiable risk factors for falls in community-dwellers are psychotropic drugs, poly-pharmacy, environmental hazards, poor vision, lower extremity impairments, and balance impairments and assessed the feasibility of recruiting older adults with possible balance problems for research conducted at a chiropractic research center, and to explore the utility of several widely used balance instruments for future studies of the effect of chiropractic care on balance in older adults (Cherly, *et al., * 2006). Wim *et al., * (2002) stated that the sit-to-stand (STS) movement is a skill that helps determine the functional level of a person. Assessment of the STS movement has been done using quantitative and semi quantitative techniques. They identified the determinants of the STS movement and to describe their influence on the performance of the STS movement (Ibid.).

The aims of this study were to compare the fall between non-obese and obese elderly individuals by using time up and go test and to find out gender influence on fall of obese elderly individuals.

Methods

Forty subjects of both genders at the age group 60–75 years were selected for this study non-randomly from Old age home, Delhi on the basis of their BMI. Twenty were non-obese and rest twenty obese elderly people. All subjects selected were able to walk without assistive devices. Subjects having cardiovascular, respiratory, neurological and musculoskeletal disorders were excluded from the study.

Tug Test Procedure: (Catherine, *et al.*, 2007)

The subjects will be requested to participate in the study. The study protocol was explained to the subjects in detail. If they fulfill the inclusion criteria, they are asked to sign an informed consent form. BMI of each subjects are calculated and assigned into obese and non-obese groups irrespective of gender. Following this, the subjects are given verbal instruction regarding the test procedure with visual demonstration of the TUGT. The subjects are asked to perform in the following manner.
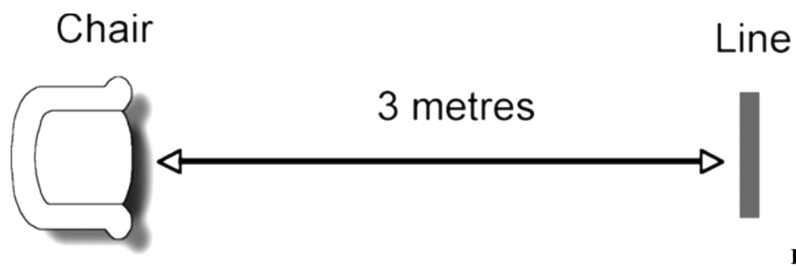
Instruction Given to Them: " When I say 'go' I want you to stand up and walk to the line, turn and then walk back to the chair and sit down again. Walk at your normal pace." Minimal training is required to score the test or interpret the results. In this test, timed subjects rise from a chair, walk three meters, turn, walk back and sit down. Participants were timed from the point where their buttocks rose from the chair to when their buttocks touched the chair when returning to sitting. During this test, subjects wear their routine footwear. No assistance, orthotic or prosthetic devices were allowed during the test. No physical assistance is permitted. All chairs used have an approximate seat height of 45 cm and arm rest height of 65 cm. We use a stopwatch to time each test and recorded the time in seconds. The subjects receive no score if they are unable to complete the test or required assistance to refrain from falling during the rest.

Results

In this study 40 subjects, 20 obese (10 male and 10 female) and 20 non obese (10 male and 10 female) elderly people were included. Descriptive information of subjects was taken as per the performa. The medical history showed that the study included subjects with no

pathological history (Table 1). For the total sample mean value for test reading for each group was calculated for non-obese male and female; obese male and female; non-obese male and obese male and non-obese female and obese female respectively as shown in the reference Table 2.

Table 1

Demographics of Participants

S. No.	Group	Gender	Age (Mean)	Height (Mean)	Weight (Mean)	BMI (Mean)	TUG (In Sec.)
1	Non Obese	male	72.1	164.25	59.2	21.937	15.1
		female	68.9	158.75	59.7	23.804	16.4
1	Obese	male	68	160.75	81.2	31.396	19
		female	67.4	162	82	31.241	19.8

Table 2

Comparison of balance by using TUG in Non-Obese (male and female) and obese (male and female)

S. No.	Group	Gender	TUG (In Sec.)	SD	SE	df	t	p
1	Non Obese	male	15.1	2.282	0.973	18	1.3	> 0.05, insignificant
		female	16.4	2.065				
2	Obese	male	19	2.114	1.614	18	0.49	> 0.05, insignificant
		female	19.8	1.549				
3	Non Obese	male	15.1	2.282	0.983	18	3.967	< 0.001, highly significant
	Obese	male	19	2.114				
4	Non Obese	female	16.4	2.065	0.816	18	4.166	< 0.001, highly significant
	Obese	female	19.8	1.549				

The result depicted in Table 2 indicated that significant difference lies in TUG between obese and non obese male ($p < 0.001$) and obese and non obese female ($p < 0.001$). It was observed that when TUG was evaluated between non-obese male and female, it was insignificant ($p > 0.05$) as well as for obese male and female ($p > 0.05$).

Discussion and Conclusion

Maintaining one's balance with advancement of age is essential for elderly individuals seeking to maintain their independence. Balance is a biological system that enables us to maintain a desired

position. Normal balance depends on information from the inner ear, other senses (such as sight and touch) and muscle movement.

The purpose of this study was to compare the fall between non obese male and female and obese male and female elderly individuals, both obese and non-obese individuals. Both TUG and the BBS are commonly used tests to predict falls. We chose to use TUG as our comparative standard because of the higher reliability demonstrated in clinical situations. A recent study showed that the Berg Balance Scale (BBS) is limited in predicting the likelihood of falls among older adults. They found the BBS to have high specificity in identifying persons at risk for falls, but low on sensitivity to whether the test can predict who will fall. The TUG was found to be a predictor of falls that occur with no obvious biomechanical precipitant and falls of precipitated by perturbation of centre of mass. It was not, however, predictive of falls occurring by perturbation of base support. Because most falls among older adults occur during walking, this type of comprehensive test would be the best assessment of dynamic balance and is a much needed assessment tool for the future detection and treatment of balance deficits by physical therapists.

Based on descriptive data, as well as perception, we believe that the study participants represent elderly people who have no medical comorbidities, are self-reliant in daily activities and are mobile in the community. Thus they represent a range of older adults who are fairly active and have fairly good health. TUG test performance decrease with impaired mobility. TUG test does not focus on independent effects of organ impairment, such as low muscle strength, decrease balance and other impairments, but measures the in traction of these factors on the performance of activities of daily living.

The fear of falling can have detrimental effects on physical function in the elderly population, but the relationship between a person's confidence in the ability to maintain balance and actual balance ability and functional mobility is not known. Line defined balance as function requiring the constant adjustment of muscle activity and joint position to retain body weight over the base of support. Balance has three basic dimensions-maintenance of a position, stabilization for voluntary movements and reaction to external distur-bances. A wide variety of physical attributes determine an individual's

balance performance. Included among them are lower extremity strength and vestibular input. In general, the literature pertaining to the relationship between balance and physical performance is equivocal.

The risk of developing problems in one or more of the sensory, motor, or adaptive brain components of balance increase with age as the body is exposed to degenerative or infectious diseases, or the effects of injuries accumulated over a lifetime. Thus, balance problems among older adults are frequently caused by combinations of subtle degenerative, infectious or injury processes that are individually not clinically significant. Contributing factors may include a history of injuries, such as concussions, ear infections, or serious sprains or fractures. We found from our study that high BMI is one of the causative factor which leads fall to elderly individuals. But we did not observed any significant influence of gender on falls of elderly individuals in our community.

References

American Geriatrics Society (AGS), British Geriatrics Society (BGS), American Academy of Orthopedic Surgeons Panel on Falls Prevention (2001): Guideline for the prevention of falls in older persons. *Journal of the American Geriatrics Society*. 49:664–672.

Baker SP, and Harvey AH. (1985): Fall injuries in the elderly. *Clin Geriatr Med.*, 1(3):501–512.

Blake AJ, Morgan K, Bendall MJ, *et al.,* (1988): Falls by elderly people at home: prevalence and associated factors. *Age Ageing*.; 17: 365–372.

Catherine M Arnold, and Robert A Faulkner,(2007): Falls in older adults with hip osteoarthritis. *BMC Geriatrics*; 7:17.

Cherly H, John K H, Ronald R Makasha, C. and Stephanie, H. (2006): Assessment of balance and risk for falls in a sample of community-dwelling adults aged 65 and older. *Chiropractic and Osteopathy*, 14:3:1746.

Jeakins KR. (2004): Effect of obesity in the onset of functional impairment among older individuals. *Gerontologist*; 18: 342–355.

Jensen GL, Friedmann JM, (2002): Obesity association with functional decline in community-dwelling rural older persons. *J Am Geriatr Soc*. 50:918–923.

Kirsten K N, James G.G. and Gillian H. (2003): Screening, education, and associated behavioural responses to reduce risk falls among people over age 65 years. *Phys Ther*.; 83:631–637.

Maki BE, and Holliday PJ, and Topper AK (1991): Fear of falling and postural performance in the elderly. *J Gerontol*, 46(4): M123–31.

Moreland J, Richardson J, Chan DH, O'Neill J, Bellissimo A, Grum RM, and Shanks L. (2003): Evidence-based guidelines for the secondary prevention of falls in older adults. *Gerontology*. 49(2):93–116.

Tinetti ME, Speechley M, Ginter SF. (1988): Risk factors for falls among elderly persons living in the community. *N Engl J Med*.;319: 1701–1707.

Wim GM Janssen, Hans BJ and HenkJS. (2002): Determinants of the sit-to-stand movement:. *Phys Ther*.; 82:866–879.

Wolfson L, Judge J, Whipple R, and King M. (1995):Strength is a major factor in balance, gait, and the occurrence of falls. *J Gerontol A BiolSci Med Sci*., 50: 64–67.

Prevalence and Determinants of Frailty in Older Adults in India

Yashoda Kashikar and Aarti Nagarkar

Interdisciplinary School of Health Sciences, Savitribai Phule
Pune University, Pune 411007

ABSTRACT

The present study aims at estimating community based prevalence of frailty and describes its association with social support. A cross-sectional study of 250 community dwelling older adults (=65 years) was carried out in one of the administrative wards in Pune city, Maharashtra. Face to face interviews were conducted with the help of semi-structured questionnaire. The prevalence of frailty was measured by using Fried's frailty phenotype. Uni-variate and multi-variate analysis were performed to obtain determinants of frailty. Social support and isolation were assessed using global scales. The study revealed that the prevalence of frailty in the community was 26 per cent. Pre-frail and non-frail population accounted for 63.6 per cent and 10.4 per cent respectively. Lower education, functional disability, number of prescribed medicines per day and less availability of instrumental support increased the likelihood of being frail as compared to non-frail group. Fear of falling, not going out, falls, hospitalization and economic dependency were associated with frailty. Scores for emotional support were lower for frail population (M=49.62, SD=7.52) than non-frail population (M=56.51, SD=9.58). Frail and pre-frail individuals reported higher social isolation. On the basis of present findings it may be concluded that the gap between expected and available social support is highlighted in this study. Physical

limitations, rapid changes in family structure and inter-generation communication may have resulted in social isolation of frail population. Further large-scale research in this domain is recommended.

Key words: Frailty, Social support, Social Isolation

"Frailty", a multi-dimensional geriatric syndrome that increases with age and it leads to high risk for adverse health outcomes such as falls, hospitalization, institutionalization and mortality (Bauer & Sieber, 2008; Fried *et al.,* 2001). One of the hypotheses behind occurrence of frailty states that it is a cycle that could be started via any of the clinical manifestations, which would precipitate a "vicious cycle" culminating in an aggregate syndrome. However, different initial manifestations may lead to differential rates of progression to frailty, (Xue, 2011) making it complicated to define and measure frailty in the older adults. Frailty is different from the normal aging in terms of poor resolution of homeostasis after any stressor event such as infection or fall or surgery. This minor stressor leads to disproportionate changes in the health status, decreasing mobility and limiting independence thereby increasing the vulnerability of the older adults. (Bergman *et al.,* 2007; Clegg & Young, 2013) Presence of two or more chronic illnesses (Co-morbidity), repeated experience of falls or injuries, disability and pertaining mortality are some of the observed features of frail older adults (Fried *et al.,* 2004; Wong *et al.,* 2015). Increased risk of such adverse health outcomes affects health as well as social life and overall quality of life of the older adults. The literature provides evidence for high prevalence of depression, suicidal thoughts and poor quality of life among frail population (Lin *et al.,* 2014; Fiske *et al.,* 2009; Brown *et al.,* 2014). In the last decade, researchers have identified risk factors of frailty from various domains such as genetic-biological factors, socio-demographic and psychosocial factors. Some of these factors have shown positive effect on frailty such as regular exercising, having friends and social network, good hand-grip strength and feeling of self confidence to manage everyday functions. (Shimada *et al.,* 2004; Sasaki *et al.,* 2007; Donnelly & MacEntee, 2012) Psycho-social factors like engagement of older adults in social groups, having social networks, interactions with peers help people to cope

with the stress of day-to-day life. These mechanisms may delay the occurrence of adverse outcomes in frail older adults (Dent & Hoogendijk, 2014). Hence, it is interesting to study the variation of perceived support across frail categories. The present paper aims at providing community based prevalence and socio-demographic and health related factors associated with frailty. Additionally, this paper focuses on the components of social support and its relation to frailty.

Methodology

The present study was a cross-sectional study of community dwelling older adults aged 65 years and above.

Study area

"Pune" is one of the largest cities in Maharashtra; it is divided in fifteen administrative wards and corresponding electoral wards. The present study was carried out in "Warje-Karvenagar". It is one of the administrative wards in Pune city with area of 14.7 square km. It is urbanized area with well-built societies at one side and slums at the other.

Sampling and Sample Size

"Multi-stage random sampling" was done by first identifying the ten zones from the ward area and then household having at least one older adult were visited to collect data. From each selected zone, twenty-five to twenty-eight interviews were taken. Community based prevalence of frailty in Pune city or Maharashtra and even at the time of this study, for India was unavailable. Hence, a pilot study was carried out in an adjacent ward to estimate prevalence of frailty, which was 20 per cent. Hence, At 95 per cent CI, sample size becomes 246 older adults. Data of 253 older adults was collected, three forms were incomplete and hence, final data of 250 older adults was considered for the analysis.

Study Sample

Both male and female participants with the age 65 years and above and those who agreed to give written informed consent. People with diagnosed Alzheimer's disease or dementia were excluded from study.

Tools

Pre-tested, semi-structured questionnaire was used to collect data.

A. To measure frailty, Fried's frailty phenotype (Fried *et al.*, 2001), a five-item scale inquiring un-intentional weight loss (Self reported, Yes or No), exhaustion (Self reported, Yes or No), physical activity (Weekly frequency of activities like walking, yoga, gardening, running or any sports), hand-grip strength (Muscle strength measured by hand dynamometer) and walking time (time required to walk 6 m) was used.

When there is unintentional loss of weight (=3 kg), frequent experience of exhaustion/tiredness, low physical activity (frequency of exercise <5 times a week), low grip strength (For Men: [BMI =24 and GS<29 kg]; [24 <BMI =28 and GS <30 kg]; [BMI >28 and GS=32 kg]; For Women: [BMI =23 and GS<17]; [BMI 23.1–29 and GS =18 Kg]; [BMI >29 and grip strength <21 kg]) and slow walking time (In men: [height =173 cm and time =7 seconds]; [height >173 cm and time =6 seconds]. In women: [height =159 cm and time =7 seconds]; [height >159 cm and time =6 seconds])

Based on these cut offs provided by Fried and colleagues (2001), an individual is said to be frail when he meets three out of five phenotypic criteria explained above.

B. To measure availability of perceived instrumental (physical), emotional support and the degree of social isolation; three globally validated six-item PROMIS (Patient Reported Outcomes Measurement Information System) scales were used (Reeve *et al.*, 2007). Each scale was originally obtained in English and then it was translated in local language (Marathi) with the help of experts. Pilot testing of translated scales was carried out before using it in the study. Reliability of all three scales was excellent as Cronbach's á values for each scale was 0.9 and above. Each scale had five options ranging from never (0) to always (5). Hence, minimum score of any scale would be 6 and maximum 30. This raw score was further transformed into T-score, which rescaled the raw score into a standardized score with a mean of 50 and a standard deviation (SD) of 10.

(a) *Scale of Instrumental (physical) Support:* Instrumental support is a physical support provided by someone to an individual having

difficulty in performing any kind of a task. The scale probed the availability of instrumental support in the form of questions as "Do you have someone when confined to bed?", "Do you have someone to take you to doctor?", "Do you have someone to help with your daily chores when you are sick?" and about having someone to run errands and prepare meals for the older adult. For each question, options like never, rarely, sometimes, usually and always were provided. More score indicates more availability of support.

(b) *Scale of Emotional support:* Emotional support is needed in old age along with the usual provision of care. This was measured by asking questions about availability of someone when the respondent "wants to talk", "needs to share his/her feelings", "to understand his/her problems","to tell about having a bad day" and "do you have someone who makes you feel appreciated?" Options ranging from never to always were provided. More score indicates more availability of support.

(c) *Scale of social isolation:* Scale measuring social isolation was similar to rest of the scales however, higher the score on this scale indicates higher social isolation. The scale probed the frequency of feeling "left out", "isolated", "isolated even when not alone", "people barely know me" and "people avoid talking to me" in a week prior to the interview among the participants.

C. Functional disability was measured by using a validated index called Pune-Functional Ability Assessment Tool (FAAT) (Nagarkar *et al.,* 2014). The scale comprised of fourteen items that embrace both ADLs and IADLs and responses were recorded on the four point scale ranging from 'no difficulty in performing', 'some difficulty', ' most difficulty 'and 'unable to do the activity.' The respondents with FAAT index three and above (=3), were categorized as disabled individuals.

Data Collection

Data collection was done by visiting household and conducting face-to-face interviews of respondents with the help of the questionnaires. Hand-grip strength and walking time was measured at the same time in the household of the respondent. Three readings of grip

strength were taken, mean of those readings was considered as final measure. Data collection was carried out from December 2014 to January 2015.

Data Analysis

The collected data was then entered and final datasheet was prepared for analysis. Data was analysed with the help of Statistical Package for Social Sciences (SPSS) version 19.0. Prevalence of frailty was obtained based on the cut-offs of five items in the Fried's frailty Phenotype. Those who were frail in =3 items were considered as "Frail". Those who were frail in 1 or 2 criteria were labelled as "Pre-frail". Associations between the frail categories and other independent factors such as socio-demographic and health related variables were examined by performing Uni-variate analysis; p value <0.05 was considered as significant association. Particularly for scales, One-way ANOVA was performed to find out the mean differences of scores of global scales across the three frail categories. Factors associated with frailty were further analyzed by performing regression analysis to obtain odds ratio.

Ethics

Prior to data collection, informed consent was obtained from each participant.

Results

Characteristics of Population

The mean age of the study population 73.9 years (SD=6.4) and fifty per cent were women. Two third of the respondents were married while remaining were either widowed or unmarried. Only 7 per cent participants were illiterate, 51 per cent were educated up to high school level. Rest 42 per cent were having minimum higher secondary education. Majority were living with their extended families (66.4%). Most of the participants were economically independent (54.8%), however participants dependent partially (22.8%) and totally (22.4%) on the family were observed in the study. Health history revealed that 197 (78.8%) participants had at least one

chronic disease. Presence of co-morbidity and poly-pharmacy was 38.4 per cent and 36.8 per cent respectively.

Prevalence of Frailty

Out of 250 older adults, 65 individuals were categorized as frail hence prevalence of frailty among older population was 26 per cent. Prevalence of pre-frailty accounts for 63.6 per cent (n = 159) and non-frail or robust older adults constituted for 10.4 per cent (n = 26). Major contributor to frailty was walking time (76%) and grip strength (69.2%). In all five criteria of frailty phenotype, more per cent of women were found frail as compared to men. For instance, 82.4 per cent women were found frail in walking time as compared to 69.6 per cent of men. Table 1 describes the population characteristics and Table 2 provides distribution of frailty variables across gender.

Table 1
Characteristics of Population and Sex wise Distribution of Frailty

Name of the Variable	Frequency (%)	Name of the Variable	Frequency (%)
Sex		**Living Arrangement**	
Males	125(50)	–Alone	24(9.8)
–Females	125(50)	–With family	162(66.4)
		–Other	58 (23.8)
Age groups		**Economical dependence**	
–65–75 yrs	151(60.4)	–Independent	137 (54.8)
–76–84 yrs	88(35.2)	–Partially dependent	57 (22.8)
–Above 85 yrs	11(4.4)	–Totally dependent	56 (22.4)
Education		**Member of any social group**	
–Up to 10th (=10th)	145(58)	–Yes	124 (49.6)
–Above (>10th)	105(42)	–No	126 (50.4)
Previous occupation		Co-morbidity	
-Working	191(76.4)	–No chronic disease	53 (21.2)
-Non-working	59(23.6)	–1 to 2 diseases	170 (68)
		– =3 diseases	27 (10.8)
Current working status		**No. of medicines/day**	
-Working	44(17.6)	–0 to 2 medicines	158 (63.2)
-Non-working	206(82.4)	– =3 medicines	92 (36.8)
Marital status		Functional disability	
-Married	175(70)	–Yes	144 (57.6)
-Other	75(30)	–No	106 (42.4)

Table 2
Distribution of Frailty Variables across Gender

Fried Frailty Phenotype Criteria	Total n (%)	Men (%)	Women (%)
Weight loss	46 (18.4)	17 (13.6)	29 (23.2)
Exhaustion	31 (12.4)	12 (9.6)	19 (15.2)
Grip strength (kg)	173 (69.2)	82(65.6)	91(72.8)
Slow walk (seconds)	190(76)	87(69.6)	103 (82.4)
Physical activity	53 (21.2)	24(19.2)	19 (23.2)

Association of Frailty with Socio-demographic and Health Related Variables

As described in Table 3, Chi-square test was performed keeping the three categories of frailty as dependent variable against the socio-demographic and health-related categorical factors as independent variables. Participants categorized as frail were more likely to be female, with low educational attainment, economically dependent, reporting co-morbidity, poly-pharmacy and functional disability, having fear of falling, experienced fall and hospitalization in comparison to pre-frail and non-frail participants. All these mentioned factors were significantly associated with frailty ($p < 0.05$). In addition, multivariate analysis was carried out to understand the impact of these factors. Lower education (OR = 6.03, 95% CI: 1.9–18.2), non-availability of instrumental support (OR = 3.9, 95% CI: 1.1–13.9), presence of functional disability (OR = 7.29, 95% CI: 1.8–28.0) increased the odds of being frail over non-frail population.

Table 3
Factors Associated with Frailty

	Non-frail (%) (N= 26)	Pre-frail (%) (N=159)	Frail (%) (N=65)	p-value
Sex				
Male	20 (76.9)	76(47.8)	29(44.6)	< 0.01
Female	6(23.1)	83(52.2)	36(55.4)	
Education level				
= 10th	8(30.8)	91(57.2)	46(70.8)	< 0.002
> 10th	18(69.2)	68(42.8)	19(29.2)	

Contd...

Contd...

Chronic diseases				
No disease	10(38.5)	36(22.6)	7(10.8)	< 0.045
1–2 diseases	15(57.7)	105(66)	50(76.9)	
=3 diseases	1(3.8)	18(11.3)	8(12.3)	
Hospitalization				
No	22(84.6)	110(69.2)	37(56.9)	< 0.03
Yes	4(15.4)	49(30.8)	28(43.1)	
Experienced fall				
No	23(88.5)	117(73.6)	39(60)	< 0.016
Yes	3(11.5)	42(26.4)	26(40)	
Fear of falling down				
No	23(88.5)	111(69.8)	27(41.5)	< 0.00*
Yes	3(11.5)	48(30.2)	38(58.5)	
Disability				
No	22(84.6)	72(45.3)	12(18.5)	< 0.00*
Yes	4(15.4)	87(54.7)	53(81.5)	
Number of medicines/day				
0 to 2 medicines	25(96.2)	94(59.1)	39(60)	
=3 medicines	1(3.8)	65(40.9)	26(40)	< 0.001*
Go out frequency				
Daily	11 (19.3)	40 (70.2)	6 (10.5)	< 0.00*
Weekly	12 (11.8)	72 (70.6)	18 (17.6)	
Fortnightly/Monthly	2 (8.7)	19 (82.6)	2 (8.7)	
Occasionally/Rarely	1 (1.5)	28 (41.2)	39 (57.4)	

* (p < 0.001)

### Frailty and Social Support, Participation and Isolation

Social support was considered as any assistance (including emotional or tangible) provided to individuals, frequency of contact with others, and perceived adequacy of that support (Hooyman & Kiyak, 2002). Results of social support was divided into three components as, "availability of support", "social participation" and "social isolation".

Availability of Support

Instrumental (physical/tangible) and emotional support, an essential component in the later years of life was assessed using PROMISE scale as described in the Methods section. Instrumental support or physical help in daily activities and emotional support refers to perceived feelings of being cared for and valued as a person;

having confidant relationships. The mean scores of the scales across three frail categories are displayed in Figure 1.

Figure 1
Variation in Mean Scores of Three Scales Across Frail Categories
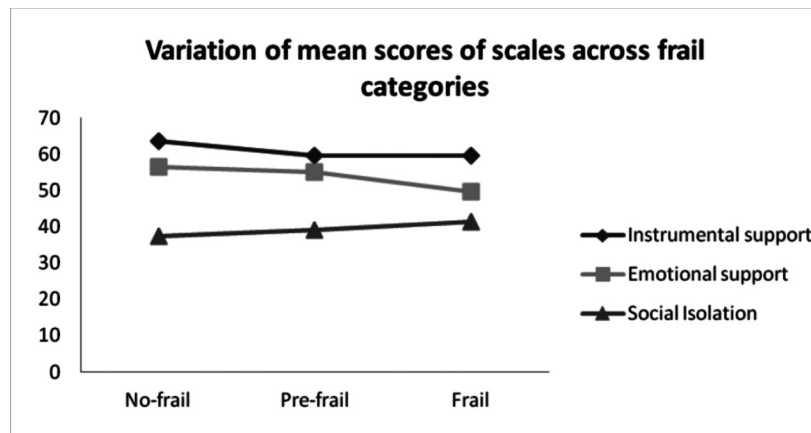
Instrumental Support

Mean score (Mean±SD) for instrumental (physical) support varied among the three categories; non-frail (63.72±3.01), pre-frail (59.62±8.01) and frail individuals (59.68±7.52) indicated more physical support available to robust individuals than pre-frail and non-frail. Nearly 20–30 per cent of the frail and pre-frail participants reported that having someone to run errands, help in daily chores, help in preparation of meals or someone to take over responsibilities was available sometimes but not always as opposed the non-frail individuals.

Emotional Support

Highest availability of constant emotional support was recorded by non-frail (56.51±9.58) and pre-frail (55.20±9.17) over frail individuals (49.62±9.87). Only 29 per cent frail individuals recorded they always have someone who makes them feel appreciated. Almost 40–50 per cent frail older adults did not have anybody who can

understand their problems, whom they can confide or talk if they had a bad day. Non-frail individuals reported similar observations but they scored more on the having someone to trust and express feelings.

Social Participation

Frequency of going out, membership of social groups, having close friends and participation in leisure activities were assessed to find out social engagement of the study participants. Going out and membership of group was significantly associated with frailty. Going out for shopping or personal work was lowest among frail individuals; most (60%) of them reported they "occasionally" or "rarely" go out. Less than forty per cent of frail individuals were member of social groups as compared to pre-frail (54%) and non-frail (53.8%). Interestingly, 86 per cent of total study participants reported having close friends; however number of close friends varied among non-frail (88.5%), pre-frail (93.1%) and frail (67.7%) older adults. Free listed leisure time activities were watching television (90%), reading (82%), up keeping house (50.4%), lying down in a bed (40.8%), visiting market (22%) and solving puzzles (18%).

Social Isolation

Higher scores on the scale indicated higher degree of isolation. Frail individuals reported mean score of 41.59 ± 9.74, whereas, lower mean scores were observed for pre-frail (39.09 ± 7.56) and non-frail individuals (37.36 ± 6.17). Nearly 40 per cent of frail participants felt left out, isolated even when not alone, or felt people avoid talking to them.

Discussion

The present paper provides community based prevalence and factors associated with frailty along with a relation between social support, participation, isolation and frailty. The community-based prevalence of frailty obtained from this study was 26 per cent which was similar to the other developing nations like Brazil (17%–31%), Russia (21%–44%) and Asian countries like China (5%–31%) (Nguyen *et al.,* 2015). Recently published multi-centric study provided

community based prevalence for India as 55.5 per cent, highest among the rest of five countries selected for the study (Biritwum *et al.,* 2015). The factors found significantly associated with frailty were female gender, low educational level, economic dependency, fear of falling, experience of falls, hospitalization, co-morbidity and poly-pharmacy were also reported in the previous studies (Gale *et al.,* 2014; Castell *et al.,* 2013; Khandelwal *et al.,* 2012; Syddall *et al.,* 2010). Result of multivariate analysis was consistent with findings from previous studies where lower education and functional disability increased the odds of being frail (A´vila-Funes *et al.,* 2008; Çakmur, 2013). The wide confidence intervals necessitate a further exploration using a large sample size. There is a debate whether disability is a consequence of frailty or frailty as an outcome of disability (Fried *et al.,* 2004; Bergman *et al.,* 2007). In the present study, frail individuals reported significant number of functional disabilities in their daily activities and instrumental activities of daily living.

The most significant outcome of our study is the data on social engagement. Social engagement of older adults is an extent to which persons are meaningfully involved in their social environment. It provides a sense of purpose and control over one's life and efficacy in one's abilities (Kawachi *et al.,* 1996). Active engagement in solving puzzles, reading, listening to music, writing as a leisure time activities have shown to have positive effects on the cognitive abilities of older adults (Hall *et al.,* 2009; Pillai *et al.,* 2011). However in the present study 20–25 per cent participants were actively engaged in the activities listed below. They reported watching television for long hours up to 6 hours per day. A study in Australian older adults showed that watching television for long hours was directly related to mortality (Pavey *et al.,* 2013). Participants also reported visiting market, reading, lying down in bed; however, solving puzzles were reported by least number of participants (18%). There is a need to promote active engagement of older adults in such fruitful leisure time activities. Another indicator of social engagement was 'going out'. A Japanese study concluded that the frequency of going outdoors might be a useful and simple indicator to predict changes in functional capacity, intellectual activity and self-efficacy (Kono *et al.,* 2004). Hence, when

an older adult complains or denies going out; it could be a signal of inability of an older adult which must be further investigated. Non-frail individuals participated in the social activities whereas pre-frail and frail individuals faced functional restrictions therefore did not participate in many social activities. We need to design and promote activities for frail and pre-frail individuals that will improve their social engagement. Studies on social engagement have reported positive effects on the well-being of older adults (Fiske *et al.,* 2009; Mendes de Leon *et al.,* 2003). A study among Spanish older adults has concluded that poor social connections, infrequent participation in social activities, and social disengagement were predictors of cognitive decline in older adults (Zunzunegui *et al.,* 2003). As we observed the lack of social engagement in the participants, we collected their responses on the social isolation scale. The social isolation scale was useful because it brought out the extent of isolation in the individuals staying alone as well as those who were in the extended family set up. Kopec (1995) has acknowledged that social isolation is a result of functional impairments that lead to restrictions in individuals' life and this reduces individual's capacity for social activity. Most of the individuals who recorded higher social isolation were females (63.8%), who were not a member of any social group (61.7%), had lower educational attainment (66%), had fear of falling down while walking (52.1%) and had functional disability (74.5%). Social isolation was highest among people living alone (45.8%), who were living in extended families (40.1%) and then people living with spouse (28.1%). A loss of spouse and living alone has been identified as a risk factor for social isolation (Dugan & Kivett, 1994; Cacioppo *et al.,* 2009). However, the older adults in spite of being with family feel lonely and isolated and this indicates the intergenerational gap. When there is a loss of spouse, older adult becomes part of son's family or continues to stay alone. As people living alone increased from 2.4 per cent (1992–95) to 5 per cent (2005–06) (Kumar *et al.,* 2011), India would face added burden of care giving to such older adults. Increasing participation in senior citizen groups (SCGs), social groups or volunteer's bureau may reduce isolation in older adults.

Emotional support perceived by older adults with health issues was considered to be a factor to experience subjective health (Wang & Stumbo, 2009). The results showed variation in the mean values of scores of emotional support for non-frail and frail. Non-frail individuals being healthy and active reported more social contacts outside the home, other than family members. Whereas, being most of the times at home due to ill-health and restrictions because of functional disability; frail individuals interact often only with family members and could not maintain a social life. Hence, their perception of emotional support is usually influenced by interpersonal relation-ships with the support provider (family members). It was noted that expectations of the adequacy of emotional support were more likely to be influenced by negative interaction (Krause, 1995). It is necessary for care providers to connect emotionally with older adults which might help in preventing episodes of depression and anxiety among frail individuals (Pejner *et al.,* 2012).

In conclusion, population ageing in India would bring lot of challenges; frailty, disability and wellbeing of these individuals have been identified in this research. Changing social environment has brought up many issues like social participation and isolation. Future policy, programmes and interventions need to focus on these issues.

References

A´vila-Funes, J.A., Helmer, C., Amieva, H., Barberger-Gateau, P., Goff, M., Ritchie, K., & Dartigues, J.S. (2008). Frailty Among Community-Dwelling Elderly People in France: The Three-City Study. *Journal of Gerontology: Medical sciences*, 63A, 1089–1096.

Bauer, J.M., & Sieber, C.C. (2008). Sarcopenia and frailty: A clinician's controversial point of view. *Experimental Gerontology*, 43,674–678.

Bergman H., Ferrucci, L., Guralnik, J., Hogan, D.B., Hummel, S., Karunananthan, S., & Wolfson C. (2007). Frailty: An Emerging Research and Clinical Paradigm – Issues and Controversies. *Journal of Gerontology: Medical sciences*, 62A, 731–737.

Biritwum, R., Minicuci, N., Yawson, A.E., Thiele, E, Sterner, K., Eick, G., Kowal, P. & on behalf of the WHO SAGE collaboration. (2015). Patterns of frailty and disability in older adults from China, Ghana, India, Mexico, Russia and South Africa. Paper presented at Population Association of America 2015 Annual Meeting conference.

Brown, P.J., Roose, S.P., Fieo, R., Liu, X., Taina, R., Sneed, J.R., Rutherford, B.R., Devanand, D.P., & Avlund, K. (2014). Frailty and depression in older adults: A high-risk clinical population. *Am J Geriatr Psychiatry*, 22, 1083–1095.

Cacioppo, J., Fowler, J., & Christakis N. (2009). Alone in the Crowd: The Structure and Spread of Loneliness in a Large Social Network. *J Pers Soc Psychol*, 97, 977–991.

Çakmur H. (2013). Frailty Among Elderly Adults in a Rural Area of Turkey. *Rev Lat Am Enfermagem*, 21.

Castell, M.V., Sánchez, M., Julián, R., Queipo, R., Martín, S. & Otero, A. (2013). Frailty prevalence and slow walking speed in persons age 65 and older: implications for primary care. *BMC Family Practice*, 14:86. 1–9.

Clegg A., & Young J. (2013). Frailty in Older People. *Lancet*, 381, 752–62.

Dent, E., & Hoogendijk, E.O. (2014). Psychosocial factors modify the association of frailty with adverse outcomes: a prospective study of hospitalised older people. *BMC Geriatrics*, 14(108), 1–8.

Donnelly, L.R., & MacEntee, M.I. (2011). Social interactions, body image and oral health among institutionalised frail elders: an unexplored relationship. *Gerodontology*, 29, 28–33.

Dugan, E., & Kivett, V. (1994). The Importance of Emotional and Social Isolation to Loneliness Among Very Old Rural Adults. *The Gerontologist*, 34, 340–346.

Fiske, A., Wetherell, J.L., & Gatz, M. (2009). Depression in Older Adults. *Annu Rev Clin Psychol*, 5, 363–389.

Fried, L.P., Ferrucci, L., Darer, J., Williamson, J.F. & Anderson, G. (2004). Untangling the concepts of disability, frailty, and

comorbidity: implications for improved targeting and care. *J Gerontol A Biol Sci Med Sci*, 59, 255–263.

Fried, L.P., Tangen, C.M., Walston, J., Newman, A.B., Hirsch, C., Gottdiener, J., & McBurnie, M.A. (2001) Frailty in older adults: evidence for a phenotype. J Gerontol A Biol Sci Med Sci, 56, 146–156.

Gale, C., Cooper, C., & Sayer, A. (2014). Prevalence of frailty and disability: findings from the English Longitudinal Study of Ageing. *Age and Ageing*, 1–4.

Hall, C.B., Lipton, R.B., Derby, C.A., & Verghese, J. (2009). Cognitive activities delay onset of memory decline in persons who develop dementia. *Neurology*, 73,356–361.

Hooyman, N. R., & Kiyak, H. (2002). *Social gerontology* (6th ed.). Boston: Allyn and Bacon.

Kawachi, I., Colditz, G., & Ascherio, A. (1996). A prospective study of social networks in relation to total mortality and cardiovascular disease in men in the USA. *J Epidemiol Community Health*, 50, 245–251.

Khandelwal D., Goel A., Kumar U., Gulati V., Narang R., & Dey, A.B. (2012). Frailty is associated with longer hospital stay and increased mortality in hospitalized older patients. *The Journal of Nutrition, Health & Aging*, 16, 732–735.

Kono, A., Kai, I., & Sakato, C. (2004). Frequency of going outdoors: a predictor of functional andpsychosocial change among ambulatory frail elders living at home. *Journal of Gerontology: Medical Sciences*, 59A, 275–280.

Kopec, J. A. (1995). Concepts of disability: The activity space model. *Social Science & Medicine*, 40, 649–656.

Krause, N. (1995). Negative Interaction and Satisfaction with Social Support Among Older Adults. *Journal of Gerontology: Psychological Sciences*, 2, 59–73.

Kumar S., Sathyanarayana K.M., & Omer A. (2014). Living Arrangements of Elderly in India, paper presented by UN Fund for Population Activities, New Delhi, at the International Conference

on Challenges in Population Aging in Asia, March 14–15, 2011, New Delhi.

Lin, J.H., Huang, M.W., Wang, D.W., Chen, Y.M., Lin C.S, Tang, Y.J., Yang, S.H., & Lane, H.Y. (2014). Late-life depression and quality of life in a geriatric evaluation and management unit: an exploratory study. *BMC Geriatrics*, 14, 1–7.

Mendes de Leon, Glass, T.A., & Berkman, L.F. (2003). Social Engagement and Disability in a Community Population of Older Adults. *Am J Epidemiol*, 157, 633–642.

Nguyen, T.N., Cumming, R.G., & Hilmer, S.N. (2015). A Review of Frailty in Developing Countries. *J Nutr Health Aging*, 19, 941–946.

Pavey, T., Peeters, G., & Brown, W. (2013). Sitting-time and 9-year all-cause mortality in older women. *Br J Sports Med*, 49,95–99.

Pejner, M.N., Ziegert, K., & Kihlgren A. (2012). Trying to cope with everyday life-Emotional support in municipal elderly care setting. *Int J Qualitative Stud Health Well-being*, 7: 19613.

Pillai, J.A., Hall, C.B., Dickson, D.W., Buschke, H., Lipton, R.B., & Verghese, J. (2011) Association of crossword puzzle participation with memory decline in persons who develop dementia. *J Int Neuropsychol*, 17, 1006–1013.

Sasaki, H., Kasagi, F., Yamada, M., & Fujita, S. (2007). Grip strength predicts cause-specific mortality in middleaged and elderly persons. *Am J Med*,120, 337–342.

Shimada, H., Obuchi, S., Furuna, T., & Suzuki, T. (2004). New Intervention Program for Preventing Falls Among Frail Elderly People: The Effects of Perturbed Walking Exercise Using a Bilateral Separated Treadmill. *Am. J. Phys. Med. Rehabil*, 83, 493–499.

Syddall, H., Robert H.C., Evandrou, M., Cooper, C., Bergman, H., & Sayer, A.A. (2010). Prevalence and correlates of frailty among community-dwelling older men and women: findings from the Hertfordshire Cohort Study. Age and Ageing, 39, 197–203.

Wang, Y., & Stumbo, N. J. (2009). Factors affecting quality of life for community-dwelling older adults with a disability: Implications for therapeutic recreation practice and research. *Annual in Therapeutic Recreation*, 17, 18–30.

Wong, T.K., Nguyen, H.V., Chiu, M.T., Chow, K.Y., & Chai Seow, D.C. (2015). *The Low Fall as a Surrogate Marker of Frailty Predicts Long-Term Mortality in Older Trauma Patients.* PLoS ONE 10, 1–14.

Xue, Q.L., (2011). The Frailty Syndrome: Definition and Natural History. *Clin Geriatr Med*, 27, 1–15.

Zunzunegui M.V., Alvarado, B.E., Teodoro Del Ser & Otero A. (2003). Social Networks, Social Integration, and Social Engagement Determine Cognitive Decline in Community-Dwelling Spanish Older Adults. *Journal of Gerontology: Social Sciences*, 58B, 93–100.

Nurses' Willingness and Incentives to their Willingness to Care for the Elderly in General Hospital Ikorodu Lagos State, Nigeria

Omisakin, F.D.,* Onakoya, P.,* Ojong-Alasia, M. and Adeyanju, A.B.

Faculty of Nursing, College of Health Sciences,
Niger Delta University, Bayelsa State, Nigeria.
and
*Department of Nursing Science, Faculty of Health Sciences,
Madonna University, Elele, Rivers State, Nigeria

ABSTRACT

In Nigeria increased numbers of older people presents numerous challenges to the nurses who provide services to older clients with both acute and chronic conditions. The aims of this study are to examine the willingness of nurses to provide care to the elderly in General Hospital, Ikorodu and identify the predictors of this willingness. This study used a cross-sectional survey design. A sample size of one hundred and twenty-five (125) nurses was selected from the target population using the stratified cluster random sampling technique. A well-structured questionnaire was used to collect data. The SPSS computer program version 20.0 was used for data analysis. Descriptive and inferential statistics were used. Fisher's exact test was used to examine the association between two nominal variables. Most nurses were willing to care for the elderly patient because: it is more rewarding to give care to them (76.0%); they can teach new things (69.6%); it will help them to care for their own parents (68.8%). Also many nurses were willing to care for the elderly patient though: they are more demanding for

care (64.0%); it is hard to give them new information about their care (60.0%); they are not easy to care for (58.4%). However, some nurses are not willing care for the elderly patients because: they complain more than other age groups (49.6%); they get more involved emotionally giving care to other age groups than to them (41.6%); it is not easy to accept their death (40.0%); it depresses them (34.4%); they are sick all of the time (32.8%). Majority of nurses are willing to care for the elderly patients if: they will give them more money/incentives (76.8%); there are available resources to care and protect themselves (73.6%); the elderly is of the same gender with me (64.0%). Again, few nurses are not willing to care for the elderly because: majority of them are cognitively impaired, resistant to care, combative, and immobile (38.4%); and they have multiple co-morbidities and are very complicated (37.6%). Performing a Fisher's exact test, a 2-tailed p-value of 0.608 > 0.05 p-value was obtained. Therefore, willingness to care for the elderly patients is independent of whether you are male or female. Nurses are willing to care for the elderly patients for various reasons: it is more rewarding to give care to them; because they can teach new things; and that it helps them to care for their parents. Incentives to nurse's willingness to care for the elderly includes: incentives; availability of resources to care and protect themselves, gender and personal interactions with the elderly.

Life expectancy has increased by three decades and in the 21st century it is projected to further increase by yet another two decades (Bicket, 2002). This increase in the older population (65 years and older) requires that health care systems worldwide respond to new challenges (Crimmins, 2004). Ageism has been found to negatively affect the health care services that older persons receive, both implicitly through unfair resource allocation by the stakeholders, and explicitly, by providing offensive and poor quality treatment (Lothian & Philp, 2001). Negative biases and ageist attitudes among caregivers, and particularly nurses, toward older people in acute care settings, are more notable expressions in the health care system (Holroyd, *et al.*, 2009).

The ageing population is currently one of the main issues facing international health care systems. The global increase both in overall numbers of older people and the relative percentage compared to the total population has considerable implications both for older people themselves and for health care service delivery (Bloom & Canning, 2008). This has led to changing demands on health care systems in both developing and developed countries. The impacts of these changes are felt by the nurses, who are faced with the challenging task of caring for this older population in a range of different care settings. "Ageing is a privilege and a societal achievement. It is also a challenge, which will impact on all aspects of society in the 21st century. It is a challenge that cannot be addressed by either the public or private sectors alone: it requires joint approaches and strategies" (United Nations, 2005). Ageing comes with pleasure, pains and various challenging problems; it should be noted that when one ages, there is degeneration and dysfunction of body cells, which leads to decline in strength and ability to move about.

In Nigeria, older people are regarded with great admiration and respect: for example, it is customary for everyone to stand up when they enter a room, they are allocated the best seats and they are offered drinks and food before anyone else. They are addressed in soft voices and are not called by their first names, but instead are referred to as the father or mother of the oldest child. Young people are expected to be polite and restrained, when older people are present. In the home environment, an older person's views usually prevail. In health service facilities, older patients experiences dramatic changes to the way they are accustomed to being treated. However, the emphasis on the family potentially raises tensions with formal support. Whilst there is no doubt that the older population is growing, increasing the need for adequate health care for Nigerian older people, the culture dictates that it is the family that is primarily responsible for their care. Such cultural and religious considerations pose unique challenges to service providers especially nurses when entering homes.

Increase in numbers of older people presents numerous challenges to the health care system in Nigeria, and especially to the nurses who provide services to older clients with both acute and chronic conditions. The national media reports cited cases of elderly

patients being left lying in their own urine and faeces, having call bells taken away from them, and being left without food and drink. This is a serious problem that needed urgent attention. Healthcare of older people in the Nigeria is in the early stages of development, despite the fact that chronic diseases in the older population are now the primary conditions for which older people seek healthcare. There are no special hospital wards for older patients in Nigeria, and they are treated by general internists highlighting the need for a cost-effective national program for the care of older people in Nigeria.

It should be noted that, the current the health care system in Nigeria does not include adequate health care package for the elderly, also the shortage of nursing personnel, have created problems for older adults in accessing adequate health care of suitable quality. The acute shortage of qualified Nigerian nurses in both hospitals and health centers highlights the need for an urgent review of the Country's present and future capacity for nursing training. A major initiative is needed to raise the status of nursing generally in Nigeria, but particularly for those working with older people. "There are a lot of factors around delivering essential nursing care, such as the skill mix of the workforce, and how organizations promote practice around the care of older people" (Lomas, 2009).

Nurses are easily accessible health workers, who are in frequent contact with the elderly. Nurses have a responsibility with regard to aging; and are involved in the organization of care for older people in different care settings such as nursing homes, acute care and long-term care settings, and they need to understand the changes involved in the ageing process. Our experience is that most of our elderly patients probably need to have one to one care in order to get the kind of care that their families want them to have. Identifying those attitudes constitutes the first step in understanding the many facets of interactions between nurses and older patients.

It is important to identify both nurses' willingness to care for older patients and the predictors of their willingness to understand, predict, and if necessary, change behaviors of nurses working with an older population, thus minimizing ageism in nursing practice.

Aims of the Study

The aims of this study are to examine the willingness of nurses to provide care to the elderly in General Hospital, Ikorodu and determine the predictors of this willingness.

The Objectives of the Study

The specific objectives of this study are to:

- Examine nurses' willingness to provide care for the elderly in General Hospital, Ikorodu, Lagos State.
- Identify the predictors of nurses' willingness to care for the elderly people in General Hospital, Ikorodu, Lagos State.

Hypothesis

Ho – there is no significant relationship between nurse's gender and their willingness to care for the elderly.

Method

The Setting of the Study

The study was carried out in the General Hospital, Ikorodu, Lagos State. Ikorodu is an industrial town about twenty minutes drives from Lagos Island. The hospital provides primary and secondary health care services and also serves as a referral centre to all hospitals within and outside Ikorodu town. The hospital has ten (10) units where nurses work. The units are namely: medical, surgical, orthopedic, ophthalmology, pediatric, obstetrics and gynecology wards, out-patient and intensive care unit among others

Design and Participants

This study used a cross-sectional survey design to examine the willingness of nurses to provide care to the elderly in General Hospital, Ikorodu and determine the predictors of this willingness. A sample size of one hundred and twenty-five (125) nurses was selected from the target population using the stratified cluster random sampling technique. Nurses in the units formed the cluster while cadres of nurses form the strata. Forty per cent (40%) of nurses were proportionately selected from each cluster across the strata.

Instrument

A well-structured questionnaire developed from extensive literature review was used to collect data. The questionnaire had two sections namely section A and section B. Section A concentrated on biographical data which consisted of gender, age, professional qualification, and duration of work in the hospital of research. Section B concentrated on nurse's willingness and the predictors of their willingness to care for elderly patients in Ikorodu General Hospital, Lagos state.

Procedure

The nurses were approached during their leisure hour having performed the nursing care activities. The third author briefed the participants about the intent of the study and requested them to complete the questionnaire. The completed questionnaires were collected immediately after completion, taking 20 to30 minutes to complete. Informed written consent was obtained from each participant. Participation was voluntary and without any coercion. The aim and the reason for the study were explained to the participants. All participants were assured of anonymity and confidentiality. Institutional approvals were also obtained for the study.

Data Analysis

A statistician analyzed the data, using the Statistical Package for SPSS V20.0. Descriptive and inferential statistics were used. The statistics are presented using descriptive statistics such as frequencies, tables and percentages. Fisher's exact test was used to examine the association between two nominal variables. Fisher's exact test can be used as an alternative to the Chi-squared test to examine the association between two nominal variables in the special situation where both variables have only two categories and the sample size is relatively small (Maree & Pieterson, 2008).

Results

Table 1 shows the distribution of nurses working in the Ikorodu General Hospital according to their demographic characteristics. Majority (46.60%) of the nurses is within 26 – 35 years age range;

followed by 18 – 15 years age group (23.20%) and 36 – 45 years age group (20.80%) respectively. Overwhelming majority (92.00%) of the respondents is female; 40.00 per cent are holders of RN and 35.20 per cent are holders of double qualification (RN, RM). While 44.00 per cent of the respondents have worked for 1 to 5 year; 22.40 per cent have worked for between 6 to 10 years; 17.60 per cent for 11 to 15 years; and only 16.00 per cent had 16 years and above work experience.

Table 1
Demographic Characteristics of the Participants

Demographic Data	Frequency (N)	Percentages (%)
Age		
18–25	29	23.2
26–35	62	49.6
36–45	26	20.8
46 and above	8	06.4
Total	125	100.0
Gender		
Male	10	08.0
Female	115	92.0
Total	125	100.0
Professional Qualification(s)		
RN	50	40.0
RN, RM	44	35.2
RN, RM, B.N.Sc	19	15.2
RN, RM, B.N.Sc., M. Sc N	12	09.6
Total	125	100.0
Work Experience (years)		
1–5	55	44.0
6–10	28	22.4
1 15	22	17.6

Nurse's Willingness to Care for the Elderly

Most nurses were willing to care for the elderly patient because: it is more rewarding to give care to them (76.0%); they can teach new things (69.6%); it will help them to care for their parents (68.8%). Also

many nurses were willing to care for the elderly patient though: they are more demanding for care (64.0%); it is hard to give them new information about their care (60.0%); they are not easy to care for (58.4%). However, some nurses are not willing care for the elderly patients because: they complain more than other age groups (49.6%); they get more involved emotionally giving care to other age groups than to them (41.6%); it is not easy to accept their death (40.0%); it depresses them (34.4%); they are sick all of the time (32.8%). (see Table 2 below).

Table 2

Willingness to Care for the Elderly

S. No.	Statements	YES		NO	
		N	%	N	%
1.	I am willing to care for the elderly though they are not easy to care for	73	58.4	52	41.6
2.	I am willing to care for the elderly patients because it is more rewarding to give care to them.	95	76.0	30	24.0
3.	I am willing to care for elderly patients though it is hard to give them new information about their care.	75	60.0	50	40.0
4.	I am willing to care for elderly patients because it will help me to care for my parents.	86	68.8	39	31.2
5.	I am willing to care for elderly patients because they can teach me new things.	87	69.6	38	30.4
6.	I am willing to care for elderly patients though they are more demanding for care.	80	64.0	45	36.0
7.	I am not willing to care of the elderly patients because is more intellectually challenging	56	44.8	69	55.2
8.	I am not willing to care for elderly patients because it is not easy to accept their death.	50	40.0	75	60.0
9.	I am not willing to care for elderly patients because they complain more than other age groups.	62	49.6	63	50.4
10.	I am not willing to care for elderly patients because it depresses me.	43	34.4	82	65.6
11.	I am not willing to care for elderly patients because they are sick all of the time.	41	32.8	84	67.2
12.	I am not willing to care for elderly patients because I get more involved emotionally giving care to other age groups than to them.	52	41.6	73	58.4

Incentives to Nurse's Willingness to Care for the Elderly

Table 3 below, revealed that majority of nurses are willing to care for the elderly patients if: they will give them more money/incentives (76.8%); there are available resources to care and protect themselves (73.6%); the elderly is of the same gender with me (64.0%). However, less than fifty per cent of nurses are not willing to care for the elderly because: majority of them are cognitively impaired, resistant to care, combative, and immobile (38.4%); and they have multiple co-morbidities and are very complicated (37.6%).

Table 3

Incentives to Nurse's Willingness to care for the Elderly

S. No.	Predictors	Yes		No	
		N	%	N	%
	I am willing to care for the elderly patient if they will give me more money/incentives.	96	76.80	29	23.20
	I am willing to care for the elderly patient if the elderly is of the same gender with me.	80	64.0	45	36.0
	I am willing to care for the elderly patients if there are available resources to care and protect myself.	92	73.6	33	26.4
	I am not willing to care for the elderly patients because majority of them are cognitively impaired, resistant to care, combative, and immobile.	48	38.4	77	61.6
	I am not willing to care for the elderly patients because they have multiple co-morbidities and are very complicated.	47	37.6	78	62.4

Testing of Hypothesis

The hypothesis statement is that there is no significant relationship between nurse's gender and their willingness to care for the elderly (see Table 4).

Table 4

Contingency table

	Males	Females
Yes	6	65
No	4	50
Total	10	115

Performing a Fisher's exact test on this table, a 2-tailed p-value of 0.608 was obtained. Since this value is greater than 0.05, the conclusion is that willingness to care for the elderly patients is independent of whether you are male or female. Therefore, the hypothesis that there is no significant relationship between nurse's gender and their willingness to care for the elderly in Ikorodu General Hospital is accepted.

Discussion

Nurses are the key professional most in touch with patients' and their families' health needs in the hospital. The responsibilities of nurses can be recognized in providing practical nursing care for patients in the hospital, giving emotional advice, and liaising with specialist colleagues. Therefore, nurses have the potential to play an important role in the care for the elderly, which is the main reason this study is investigating their willingness.

Demographic Characteristics of the Respondents

Considering the demographic characteristics of nurses working in Ikorodu General Hospital, Lagos, majority (46.6%) of them belong to 26 – 35 years age range; followed by 18 – 15 years age group (23.2%) and 36 – 45 years age group (20.8%) respectively. Overwhelming majority (92.0%) is female; and most of them are Registered Nurses (RN) without additional qualification. Also majority of nurse have work experience of 1 to 5 years, and only 16.0 per cent had 16 years and above work experience. As the number of older patients increases, a sufficient number of nurses will be needed to care for them and to relieve the workload. The solution is complex and depends on the collaborative actions of government agencies, health care providers, colleges and universities, and nurses especially.

Willingness to Care for the Elderly

This identified the district nurses' consent to provide nursing care services in the in the hospital if they encounter an elderly patient. There are anecdotal reports that the nurses in current workforce today is not prepared to care for the elderly population. Many experts say the foundation for successful gerontology nursing practices begins in school and continues as nurses enter the workforce (Hweidi, &

Al-Hassan, 2005; Laidlaw, *et al.*, 2010). Most nurses in this study were willing to care for the elderly patient for various reasons: it is more rewarding to give care to them; because they can teach new things; and that it will help them to care for their parents. In order words, having an elderly parent is a predictor of the willingness of nurses to care for elderly patients in this setting. Also many nurses were willing to care for the elderly patient despite the associated challenges such as: more demand for care; hard to give them new information about their care; and that they are not easy to care for. Most nurses, whether or not they work primarily with a geriatric population, will care for elderly patients at some point in their careers; knowing the normal signs of aging is an essential skill.

However, some nurses are not willing care for the elderly patients because: they complain more than other age groups; get more involved emotionally giving care to other age groups; it is not easy to accept their death and that it depresses them; because they are sick all of the time. Less than fifty per cent of nurses in the study are not willing to care for the elderly because: majority of them are cognitively impaired, resistant to care, combative, and immobile; and have multiple co-morbidities and are very complicated. There is a pressing need for competencies surrounding normal aging, cultural norms, and the very fine line of effective communication with the patient. This is because elderly patients have physical, psychological, and emotional needs that are unique. Nurses who care for elderly patients have an important and irreplaceable role. They should try to help their patients protect their health and cope with changes in their mental and physical abilities, so elderly patients can stay independent and active as long as possible.

Nurses have to think of what aging does to vision and hearing (Nelson, 2004; Herdman, 2002). There can be changes in balance, memory, or mobility (Palmore, *et al.*, 2005). Personal interactions and communication also allow nurses to glean an understanding of what is a normal result of aging and what might be a red flag for something more serious (Corner, *et al.*, 2007). There is pressure to do things quick, but it is extremely important to connect with the patient and be a good detective and pick up signs when something is wrong. It has been noted that the majority of nurses who look after older people are

highly motivated and committed, but they are overstretched and overloaded. Organizations need to start recognizing the level of complexity involved in the care of older people, and start having conversations with ward based staff about what needs to happen to change practice (Sourajit, 2013).

Predictors of Nurse's Willingness to Care for the Elderly

Majority of the nurses are willing to care for the elderly patients if: they will give them more money/incentives; available resources to care and protect themselves; and when the elderly is of the same gender with me. When nurses can earn more money in an acute care setting than in a long-term facility setting, they are generally drawn to the higher pay scale. Payment reform has to occur to attract more nurses to the field of geriatric nursing "It is hard to support yourself with what a geriatric nurse makes today," says Cortes. Having an elderly parent is a predictor of the willingness of nurses to care for elderly patients in this setting because some believe it will help them to care for their parents. The issue of gender is of importance for nurse's willingness to care for the elderly as some of the nurses are willing to care for the elderly if of the same gender. Nurse Managers should also put this into consideration when allocating job in elderly care settings.

Conclusion

Nurses are willing to care for the elderly patients for various reasons: it is more rewarding to give care to them; because they can teach new things; and that it helps them to care for their parents. Predictors of nurse's willingness to care for the elderly includes: incentives; availability of resources to care and protect themselves and personal demographic characteristic such as gender and having an elderly parent as well as their personal interactions with the elderly.

Recommendations

Nurses who care for the elderly have to anticipate regular age-related problems as well as treat abnormal and more serious illnesses. They must do so with compassion and consideration, realizing their client's psyche and emotions may be as fragile as their physical health. They are expected to:

- Integrate advanced knowledge and experience in delivering safe, effective quality care to geriatric clients in the hospital.

- Demonstrate competence in managing the health/illness status of geriatric clients in the hospital.

- Manage and negotiate within the health care delivery system on behalf of geriatric clients in primary care.

- Monitor and ensure quality health care for geriatric clients in primary care. Incorporate an understanding of trends in aging in planning and providing care for clients.

- Demonstrate leadership and competence in implementing the role of the primary care nurse practitioner.

- Engage in counseling, communication, collaboration and teaching in a manner that reflects caring, advocacy, ethics and professional standards.

- Conceptualize ones individual role as a geriatric nurse practitioner and one's personal philosophy of care practice.

References

Bicket, D. (2002). Using ACE inhibitors appropriately. *American Family Physician, 66*(3), 461–468.

Bloom, D. E., & Canning, D. (2008). Global demographic change: Dimensions and economic significance RID A–1917–2008. *Population and Development Review, 34*, 17–51.

Corner, L., Brittain, K., & Bond, J. (2007). Social aspects of ageing. *Psychiatry, 6*, 480–483.

Crimmins, E. M. (2004). Trends in the health of the elderly. *Annual Review of Public Health, 25*, 79–98. doi:10.1146/annurev.publhealth.25.102802.124401

Herdman, E. (2002). Challenging the discourses of nursing ageism. *International Journal of Nursing Studies, 39*(1): 105–114.

Holroyd, A., Dahlke, S., Fehr, C., Jung, P., & Hunter, A. (2009). Attitudes toward ageing: Implications for a caring profession. *The Journal of Nursing Education, 48*(7): 374–380.

Hweidi, I. M., & Al-Hassan, M. A. (2005). Jordanian nurses' attitudes toward older patients in acute care settings. *International Nursing Review, 52*(3), 225–232. doi:10.1111/j.1466–7657.2005.00434.x

Laidlaw, K., Wang, D., Coelho, C., & Power, M. (2010). Attitudes to ageing and expectations for filial piety across Chinese and British cultures: A pilot exploratory evaluation. *Ageing & Mental Health, 14*(3), 283–292. doi:10.1080/13607860903483060

Lomas, C. (2009), Shedding Pounds: Nursing and Obesity, *Nursing Times Net*, April 9.

Lothian, K., & Philp, I. (2001). Maintaining the dignity and autonomy of older people in the healthcare setting. *BMJ (Clinical Research Ed.), 322*(7287), 668–670.

Maree, K. & Pieterson, J. (2008) Sampling. In Maree, K. (ed.) *First Step in Research.*

Nelson, T. D. (2004). *Ageism: Stereotyping and prejudice against older persons*. Cambridge, MA: MIT Press.

Palmore, E., Branch, L., & Harris, D. (eds). (2005). *The encyclopedia of ageism*. Binghamton, NY: Haworth Press.

Sourajit R. (2013). Ageing in West Bengal: Past Trends and Future Direction. *Indian Journal of Gerontology, 27*(4): 588–597.

United Nations (2005): World Population Prospects: The 2004, Revision, Vol. I Comprehensive Tables, and Vol. II, Sex and Age Distributions of the World Population, Sales No. E.05.XIII.5 and E.05.XIII.6.

A Balance Device Reliability for Reaction time and Proprioception Measurement in Older Adults

Majumi M Noohu, Jamal Ali Moiz[1], Aparajit B. Dey[1], Mohammed Ejaz Hussain

Centre for Physiotherapy and Rehabilitation Sciences, Jamia Millia Islamia, New Delhi, India
[1] Department of Geriatric Medicine, All India Institute of Medical Sciences, New Delhi, India

ABSTRACT

The objective of this study was to determine the reliability of the values obtained by a balance device for evaluation of reaction time and proprioception in older adults. A convenient sample of 20 older adults were recruited. The subjects were assessed for reaction time and propriception using a balance device (Sensamove). The test retest reliability intra-class correlation coefficient (ICC 2,1), SEM and minimum detectable change (MDC) were determined. The results achieved were: ICC (2,1) was 0.79 for reaction time and 0.91 for proprioception. SEM was 0.20 for reaction time and 1.15 for proprioception values. MDC was 0.55 for reaction time and 3.18 for proprioception. It is concluded that Pedalo®⁻ Sensamove Balance Test Pro with Miniboard is a reliable instrument for assessing the reaction time and proprioception in older adults.

Keywords: Balance, Function, Fall, Outcome

Propioception is a vital component of balance control mechanism and propriception is one of the widely studied components of balance control mechanism (Horak *et al.,* 1989). Reaction time is a marker of structural and functional changes happening in an aging central nervous system (Birren *et al.,* 1980). Impairment in balance control and reaction time can lead to reduced mobility and increased risk of falls in older adults. Reduction in reaction time and changes in propioception function has been reported in people with balance impairment and with history of falls. (Lajoie and Gallaghar, 2004)

The measurements recorded should be by instruments or devices with proven psychometric properties, the data should be reliable and free of errors. The reliable data is necessary for proper plan of care and predicting prognosis/outcome of patients. There are different ways of measuring reaction time and proprioception (Elaine and Lori, 2003, Han *et al.,* 2015). Reaction time is defined as the length of time taken for the onset of a response to an unexpected stimulus. (Schmidt, 1993). Proprioception is the ability to sense position of the body in the space (Gandevia *et al.,* 1992)

Pedalo®⁻ Sensamove Balance Test Pro with Miniboard, is a device which can be used in balance testing, training and evaluating components of balance control mechanism. It's a wobble board with built-in sensor and anti-slip 10 degrees tilting pad. The data storage and processing is done through Pedalo®-Sensamove-Balance-Test Pro software in a computer. The device can be used to assess reaction time and proprioception as well (Pedalo®-Sensamove Balance Test Version 2.2 User Guide). There is no available literature on the reliability of the device for evaluation of reaction time and propioception in older adults in India. The study was undertaken to determine the reliability of Pedalo®-Sensamove-Balance Test device for assessing reaction time and proprioception in older adults.

Methods

Subjects

A convenient sample of 20 community dwelling older adults were recruited from the employees and retired employees of the Jamia

Millia Islamia, New Delhi. The inclusion criteria of the study were older adults, above 60 years of both the genders, with or without walking devices. The subjects with unstable medical conditions, any neurological disorders, severe pain, mental disorders were not included in the study. The study was approved by the institutional human ethical committee of Jamia Millia Islamia, New Delhi.

Instrument

Pedalo® ‾ Sensamove Balance Test Pro with Miniboard was used to record the reaction time and proprioception and to process the data in a computer.

Procedure

The subjects were invited for the study through a local notification in the university. Fifty people agreed for participation in study. The researchers recruited 20 subjects through random selection from the 50 people who agreed to participate in the study. The subjects were assessed for the reaction time and proprioception as per the user manual of the instrument. The background information of the subjects such as age (years), height (cm), weight (kg), number of co-morbidities, falls in last 1 year, number of medications and any injury due to falls were also collected. A signed informed consent was taken from all the participants. For test-retest reliability, the measurement was done in two sessions with gap of one week in-between first and second session. Each session lasted for 45 minutes.

The subjects were made to stand on the balance device with a cushion placed below the board. Then the subjects were asked to tilt maximum in all the four directions (front, back, right and left). This was done to check for the maximum tilting of the subjects and to make sure all the recording for reaction time and proprioception fell with this tilting angle. This was done for both reaction time and proprioception assessment.

Reaction Time

The subjects were standing on the device with a screen placed in front of the subjects. They were asked to touch on the colored spot as soon as they appear on the screen with their displayed centre of

pressure. The reaction time was calculated as the time taken for the subject in to touch the colored spot with his/her centre of pressure. The reaction time was measured individually in front, back, right and left directions. The average reaction time was also calculated. (Pedalo®-Sensamove Balance Test Version 2.2 User Guide)

Proprioception

The subjects stood on the device for testing and the proprioception testing consisted of two parts. In the first part, the subject was asked to move and touch his displayed centre of pressure on the colored spot on the screen and asked to remember the location of spot. In the second part, there was no spot in the screen and the subject had to move to the previous position where the spot had appeared. The propioception (difference in angles) was measured as the difference between the position in the second part and first part of the test. The propioception was measured individually in all directions. The average proprioception time was also calculated. (Pedalo®-Sensamove Balance Test Version 2.2 User Guide)

Data Analysis

The data were analyzed using SPSS 21.0. The test retest reliability analysis was done through ICC (2,1) determination, standard error of measurement (SEM) and minimum detectable change was calculated. The level of significance fixed was $p < 0.05$.

A paired t-test analysis was performed for two measurements to check for any systematic error. A significant difference observed in t-test is an indication of systemic error in measurement. Intra-class correlation coefficients (ICC 2, 1; two-way random, absolute agreement were computed for determining the test-retest reliability. Test-retest reliability was considered to be acceptable if the ICC was greater than 0.75 and very good if the ICC was greater than 0.9 (Riddle & Stratford, 1999). Standard error of Measurement (SEM) was calculated as follows: SEM = SD× v (1-ICC), where SD is the standard deviation and ICC is intra-class correlation coefficient value. A high SEM indicates non reproducibility of the measurements.

The minimum detectable change (MDC) at 95 per cent confidence was calculated for clinical interpretation purposes. MDC =SEM ×1.96 × v2 = 2.77×SEM.

Results

The mean $\pm$ SD, of age, height, weight, the reaction time, proprioception, number of co-morbidities, number of falls in last 1 year, medications and any injury due to falls were calculated and given in Table 1.

Table 1
Demographic Details of the Sample (n=20)

Variables	Mean + SD/no.	
	Males=12, Female=8	
Age (yrs)	71.85+4.23	
Height (cm)	159.25 +7.51	
Weight (kg)	58.50+6.98	
Co morbidities (n)	0	2
	1	10
	2	5
	3	4
Medications (n)	1	14
	2	6
Injury	0	20
No. of falls (n)		
	0	4
	1	9
	2	6
	3	1

The paired t-test analysis didn't show any significant difference between two measurements for both reaction time and proprioceptin values. ICC (2.1) was 0.79 for reaction time and 0.91 for proprioception (Table 2). SEM was 0.20 for reaction time and 1.15 for proprioception values. MDC was 0.55 for reaction time, 3.18 for proprioception (Table 2).

Table 2

Comparison of Average Scores of Reaction Time and Proprioception with Reliability Testing analysis

Variable		Time 1	Time 2	t	p	ICC (2,1)	95 % CI
Reaction Time(s)	Anterior	2.08+ 0.730	2.18+ 0 .69	–	–	–	–
	Posterior	2.70 + 1.16	2.32+2.32	–	–	–	–
	Right	2.32+1.01	2.57+0.93	–	–	–	–
	Left	2.08+ 0.83	2.27+0.97	–	–	–	–
	Average	2.29+0 .56	2.33+0.45	–0.70	0.49	0.91	0.78–0.96
Proprioception (Angle differences)	Anterior	27.38+6.09	27.48+5.09	–	–	–	–
	Posterior	30.55+7.10	27.51+5.80	–	–	–	–
	Right	22.74+7.29	24.14+7.46	–	–	–	–
	Left	31.66+7.95	28.84+5.89	–	–	–	–
	Average	28.08+4.74	26.97+3.86	–1.40	0.17	0.79	0.49–0.92

Discussion

The test-retest reliability of the values obtained for reaction time was acceptable and for proprioception it was very good. SEM was very small for both reaction time and proprioception. Standard error of measurement (SEM) is a measure of absolute reliability, which tells about the subject variability attributable to repeated measures (Atkinson & Nevill, 1998). The SEM can also be used to calculate the minimal detectable change (MDC). It is defined as the minimal amount of change that is required to distinguish a true change from a change due to variability in performance or measurement error (Nair *et al.,* 2012). Small SEM for the reaction time and proprioception scores indicates that measurements observed were steady and reproducible over time. Pedalo® – Sensamove Balance Test Pro with Miniboard shows good relative and absolute reliability.

The test is highly reliable, participant scores an average scores for reaction time as 2.29 and 2.33 on the first and second test respectively. The proroprioception measure was 28.08 and 26.97 Could we be certain that this is a true change or is the change just because of estimation error? The MDC95 score is 0.55 for the reaction time and

3.18 for proprioecption. Subsequently, to be 95 per cent sure that our participants improved as a result of given intervention, 0.55 difference should be present in the retest score of reaction time and 3.18 for prorioceptin for the test score.

The sample size was small and actual sample size requirements were not calculated. The sample was not also homogenous cause it consisted of people with history of falls too. Future studies can be done to examine the validity of the instrument.

References

Atkinson G, and Nevill AM. (1998) Statistical methods for assessing measurement error (reliability) in variables relevant to sports medicine. *Sports Medicine*; 26: 217–238.

Birren, J.E., Woods, A.M., Williams, M.V., (1980). Behavioral slowing with age: causes, organization, and consequences. In: Poon, L.W. (ed.), *Aging in the 1980s: Psychological Issues*, Washington, DC, pp. 293–308.

Elaine N. Marieb and Lori A Smith (2003). Human Anatomy and Physiology Laboratory Manual (Cat Version), 7th Ed. – Update, Benjamin Cummings, San Francisco, California. pp. 232–233.

Gandevia, S. C., McCloskey, D.I., & Burke, D. (1992). Kinaesthetic signals and muscle contraction. *Trends in neurosciences*, 15, 62–65.

Han, J., Waddington, G., Adams, R., Anson, J., & Liu, Y. (2015). Assessing proprioception: a critical review of methods. *Journal of Sport and Health Science.*

Horak, F.B., Shupert, C.L., & Mirka, A. (1989). Components of postural dyscontrol in the elderly: a review. *Neurobiology of aging*, 10, 727–738.

Lajoie, Y., & Gallagher, S. (2004). Predicting falls within the elderly community: comparison of postural sway, reaction time, the Berg balance scale and the Activities-specific Balance Confidence (ABC)

scale for comparing fallers and non-fallers. *Archives of gerontology and geriatrics*, 38, 11–26.

Nair PM, Hornby G, Behrman AL (2012). Minimal detectable change for spatial and temporal measurements of gait after incomplete spinal cord injury. Topics in Spinal Cord *Injury Rehabilitaion*;18:273–281.

Pedalo®-Sensamove Balance Test Version 2.2 User Guide. [www.pedalo.de/cms/upload/downloads/654210–01_EN_-_Pedal o-Sensamove_Balance_Test_2.2_Web.pdf: Accessed on 11–10–2015)

Riddle DL, Stratford PW (1999). Interpreting Validity Indexes for Diagnostic tests: An illustration using the Berg Balance test. *Physical Therapy*; 79: 939–948.

Schmidt, RA., 1993. Apprentissage Moteuret Performance. Vigot, France.

The Relationship between Non-custodial Grandparent Satisfaction and Role Meaning

Shahla Seifali, Rahimah Ibrahim, Tengku Aizan Hamid

Institute of Gerontology,
University of Putra Malaysia, 43400 Serdang, Malaysia

ABSTRACT

The determine role satisfaction status and identify predictors variables significantly contribute toward role satisfaction among grandparent in Kermanshah- Iran. A cross - sectional predictive correlational design was used for this study. The population comprised of 290 grandparents with average age of 67.5 years. Respondents were administered a questionnaire containing questions related to socio-demographic factors, role meaning and role satisfaction individually. The statistical package for social sciences was used for data analysis. A total 98.4 per cent of grandparents had satisfaction with the role and 76.2 per cent attributed meaning to their grandparent role. The result of multiple regression indicated that role meaning and centrality, indulgence, valued elder, re-involvement were a predictor role satisfaction. The finding s from multivariate analysis revealed significant employment status of grandparents, total role meaning and dimensions with role satisfaction.

Key words: Grandparenthood, Role satisfaction, Role meaning

Population ageing is one of the most solid demographic trends of the past few decades, particularly in developed countries (Villar, *et al.,* 2010). Iran, like many other countries world-wide, is also experiencing

the rapid growth of the elderly population and demographic transition (Annamoradnejad & Lotfi, 2010; Ahmadi, *et al.*, 2006). United Nations statistical projections demonstrate that while the proportion of people with 60 years old age and above in Iran was 5.4 per cent in 1975 it will increase to 10.5 per cent in 2025 and 21.7 per cent in 2050 (United Nations, 2009). Many factors contribute to the increase of the percentage of old people in Iran such as decreasing fertility and mortality, as well as increasing longevity (Kiani, *et al.*, 2010). It is noteworthy that Iran has a young population with more than 50 per cent under age 24 and also one of the country with the fastest growing older population of age 60 and above (Statistical Center of Iran, 2009) Moreover, with increasing rural to urban migration in Iran, there has been an extraordinary rise in international migration of young Iranians (Ghazi-Tabatabaei & Karimi, 2011).

As the proportion of grandparents increases (Harper & Levin, 2005), the number of individuals who will live part of their lives as members of three and four generation families is also increasing. Grandparenthood is a very significant phase in the family life cycle that brings with it new roles. Grandparents deserved to be given more attention compared to the past since they provide potential support for the younger generation member (Falk & Falk, 2002; Harper & Levin, 2005; Smith, 1991). Most importantly, grandparents today have the opportunity to play significant and various roles in the lives of grandchildren owing to changing trends in mortality, fertility, the number of grandchildren, grandparents' health and socioeconomic status (Thiele & Whelan, 2008; Uhlenberg & Kirby, 1998).

Grandparents' satisfaction will increase with the steady connection and this frequency contact plays an important role in other affective-cognitive assessment (Peterson, 1999). Previous studies showed that grandparents reported being happy and satisfied with their role as grandparents and with their relationships with grandchildren (Forsyth, 1994: Thomas 1989 b). Also, there are a number of studies focusing on how grandparents feel about having involvement with grandchildren. For instance, it was found that grandparents clearly welcome and expect to have interaction with their grandchildren as part of their role (Reitzes & Mutran, 2004; Somary & Strieker, 1998).

Grand parenting is associated with many meanings that are shaped by numerous factors. The meanings of grand parenting must be understood from the social norms and structures within which the grandparent role is grounded in, comprising individual, cultural, ecological, and intergenerational contexts. The changes in the nature relationships between grandparents, parents and grandchildren, the meaning role of grandparents as a consequence changes. Also, having poor health, being widowed, having limited social contact associated greater role meaning (Thiele & Whelan, 2006). Kivnick (1982) suggested for the role of grandparenting, each grandparent obtains numerous source of meaning.

The grandparent role meaning is one of the factors that are associated with grandparent role satisfaction. There is limited research on whether the non-custodial grandparents obtained greater satisfaction in their role (Bowers & Myers, 1999). Consistent with this argument, Thiele and Whelan (2008) noted that for non-custodial grandparents, the relationship is less clear and requires further examination. Similarly, Muller and Litwin (2011) reported that a small number of studies focused on noncustodial of grand parenting. As such, this study will focus on discerning the level of role satisfaction of non-custodial grandparents.

Consequently, it is necessary to identify factors which affect the role satisfaction of grandparents. Considering the significance of the relationship between role meaning and in the role satisfaction, this study was conducted to determine the relation role meaning of grandparent and its association with role satisfaction, socio-demographic factors in Kermanshah, where its ageing population has not been well studied in terms of role satisfaction. The findings of this study can be used to promote the relationship between grandparent and grandchild for our rapidly growing ageing society.

Objectives

1. To determine the relationship between grandparent's socio-demographic characteristics, role meaning and grandparent role satisfaction.

2. To determine the relationship between role meaning and role satisfaction after controlling for socio-demographic characteristics

Methodology

Sample

The sample consisted of 290 Iranian grandparents aged from 60 to 84 years were selected using proportional random sampling procedure from 20 health center Kermanshah – Iran. Approximately (66.2%) of respondents were "female" and (33.8%) were male. Descriptive characteristics of the sample are shown in Table 1. More than half of the respondents (56.2%) rated as "fair" in the health status, (37.9%) rated as "good". Over half of the respondents (62.8%) were married, 31.4 per cent were widowed and women were more likely to be married (59.9%). In terms of educational attainment, (27.6%) attended high school, (27.2%) attended elementary school. Approximately (60%) of the grandparents are still active in paid and unpaid work and (8.6%) were employed full time. The rest were either retired (35.9%) or unemployed (2.1%). More than half of the respondents (60.7%) reported that lived with their spouse and (23.4%) lived with their children. Overall, grandmothers (84.6%) were more likely to reported alone than to grandfathers (15.4%).

Tools used

Measurement of Role Satisfaction

Grandparent role satisfaction was measured using the 15-item scale developed by Thomas (1986a) which has been used in several earlier studies. Similar to the procedure adopted in previous investigations (e.g., Thomas, 1986b), in the present study the items were worded to refer to "grandchildren" rather than to a particular, referent's grandchild. A higher score indicates greater levels of grand parenting satisfaction. Each of the items is rated on a 7-point Likert-type scale from 1 to 7 ranging from 1 = very strongly disagree to 7 = very strongly agree. To minimise response bias, the scale includes both positively and negatively worded items. In this study, the Cronbach's alpha score for the role satisfaction Index was 0.73.

Measurement of Role Meaning

The role meaning instrument include four dimension namely, (1) centrality, (2) Valued elder, (3) Immortality through clan, (4) indulgence. The role meaning was measured using Hayslip (2003)17- item scale. This scale was designed to identify the meaning that grandparent's hold for grandparenthood. The participants respond on a 7–point Likert scale ranging from (1) very strongly disagree to (7) very strongly agree. In present study Cronbach's alpha for centrality = 0.81; valued elder = 0.61; Immortality through clan = 0.69 and indulgence = 0.64; overall role meaning = 0.81.

The higher score reflects greater meaning (Hayslip, *et al.*, 2003). The minimum and maximum values of the sub-scale of centrality range from 11 to 28, valued elder from 14 to 28, immortality through clan from 10 to 28 and indulgence from 11 to 21. Higher subscale scores indicated that respondents believe that their grandparent role is the main component of their own personal identity (centrality), participant values the importance of sharing wisdom with their grandchild (valued elder), values the importance of extending their family history or tradition through their relationship with their grandchild, (immortality through clan), and believe that they should provide tangible treats or intangible privileges for their grandchild.

A face-to-face interviewing technique was used for data collection, which was conducted in the respondent's home.

Statistical Analysis

Data were analyzed using the Statistical Package for the Social Sciences (IBM SPSS Version 19). Frequency, range, percentage, means and standard deviation were computed to describe data preliminarily. Bivariate analyses were conducted using a series of Pearson correlations. In the last step analysis, multiple regression analysis was used to determine socio-demographic factors that the best predict role satisfaction in grandparent.

Results

Majority of grandparents (76.2%) reported that grandparent role is meaning full. Table 1 shows distribution of respondents of role meaning. In this study, the highest mean is valued elder (M = 23.66; SD

= 2.31), followed by immortality (M = 23.04; SD = 2.98), centrality (M = 22.18; SD = 2.79) and indulgence (M = 18.88; SD = 2.00). In addition, result of study by Thiele and Whelan (2008) showed that mean and (SD) valued elder (M = 42.9; SD = 5.0), centrality (M = 36.5; 6.3), immortality (M = 26.0; M = 5.6), indulgence (M = 12.0; SD = 2.9).

Table 1
Mean, Standard Deviation, Minimum and Maximum Score of the Dimensions of Role Meaning

Items	Mean	SD	Min.	Max.
Role meaning total score	88.75	8.64	70	130
Centrality	22.18	2.79	11	28
Valued elder	23.66	2.31	14	28
Immortality	23.04	2.98	10	28
Indulgence	18.88	2.00	11	21

Respondents' grandparent role satisfaction was measured by 15 items that refer to previous studies had used by Thomas (1986a) on a 7-point Likert-type scale. The mean role of satisfaction was 72.7 (SD = 5.85) and ranged from 46-86. In addition, the mean of satisfaction rating equated to a mean item rating of 5.19. This indicated that grandparents tended to "agree" with grandparent role satisfaction. This finding is consistent with the result of previous study by Thiele and Whelan (2008) found that mean 70.3 and (S.D = 9.6), and also the mean satisfaction rating equated to a mean item rating of 5.4. So, respondents of this study tended to "agree" with the satisfaction statements.

To examine associations among variables, we carried out bivariate correlations. As indicated in Table 2, grandparent satisfaction scores generally correlate positively and significantly with the total role meaning, centrality, indulgence, valued elder, immortality through clan, and reinvolvement with grandparents. Additional employment status of grandparent correlates negatively with grandparent role satisfaction.

Table 2

Bivariate Correlations among Variables with Role Satisfaction

	11	2	3	4	5	6	7	8
1. Employment status		-.11*	.11	-.12**	.12*	-.11 -	17* -	13*
2. Centrality			-.11*	.34**	.18**	45**	79**	44**
3. Indulegence				.19**	.42**	.26**	63**	37**
4. Reinvolvement					.27**	14**	58**	18**
5. Immortality through clan						27**	52**	32**
6. Valued elder							64**	38**
7. Role meaning								53**
8. Role satisfaction								

A multiple regression analysis was performed. All predictor variables were entered into the regression equation to determine the total explained variance. Regression analysis (Table 3) showed an R^2 of 0. 34 that revealed the ability of the regression model to explain the variation in the dependent variable (role satisfaction). The model was significant at p = 0.05 with F-value of 9.936. Amongst the independent variables entered in the model, five variables were significant and these were centrality, indulgence, valued elder, reininvolvment and total role meaning. The importance of the predictor variables was assessed using beta weight. Among the four predictors, total role meaning (ß = 2.62) was the most important in influencing the variance in role satisfaction. The regression model for the enter method was as below:

Table 3

Result of Multiple Regression to Predict ROle Satisfaction of Grandparent by Controlling other Variables

Predictor Variables	B	Std. Error	Beta
(Constant)	8.034	8.970	
Age	0.06	0.08	0.05
Age of becoming grandparent	0.07	0.10	0.03
Gender	0.47	0.86	0.03
Marital status	0.70	0.77	0.04
Education	-0.62	1.56	-0.02

Cont'd...

Cont'd...

Employment	-0.36	0.87	-0.02
House hold composition	-4.28	3.13	-0.06
Age of grandchild	-0.09	0.21	-0.02
Gender of grandchild	-0.30	0.76	-0.00
Centrality	-2.66	0.68	-1.02***
Indulgence	-2.29	0.64	-0.63***
Valued elder	-2.27	0.67	-0.53**
Reininvolvment	-2.78	0.60	-0.97***
Immortality	0.22	0.14	0.09
Role meaning	2.97	0.59	2.62***
F(18,273)=9.936 R2=0.36			

*p=.05 **p=.01 ***p=.001

In this study age ($ß$ =.05, p > .05) was not a predictor of role satisfaction in the regression model also it was not a significant of grandparent role satisfaction in bivariate correlation (r =.01) (p=0.85). The association between age and reports of role satisfaction remains unclear. A large body of evidence consistently supports there is no relationship between grandparent age and grandparent role satisfaction (Peterson, 1999; Reitzes & Mutran, 2004; Thomas, 1986a). The result of survey was performed by (Somary & Strieker, 1998) found a negative relationship between age and role satisfaction. On the other hand a survey noted that a extremely weak positive association with role satisfaction (Thomas, 1986a). These inconsistent results suggested that there was little relationship between age and grandparent role satisfaction.

Marital status did not predict role satisfaction of respondents in the regression model ($ß$ =.04, p> .05). Bivariate and multivariate analyses showed that marital status of grandparent have no association with their role satisfaction. This finding is inconsistent with Kivett (1991) who reported that married grandparents will be more satisfied with the role. In addition, Reitzes and Mutran (2004) found that being married for grandmothers increased grandparent role satisfaction, whereas married grandfather actually report lower satisfaction with their role than do unmarried grandfather. Also, grandmother feels more comfortable being a grandparent when they are also married (Thomas, 1989 b).

In addition, in bivariate and multivariate analyses showed all of dimensions of role meaning have significantly with role satisfaction and centrality, indulgence, valued elder, reininvolvment were a predictor of grandparent role satisfaction in the regression model. This result supports previous study from Kivnick (1980), reported that relationship between grandparenting and life satisfaction. From his study, five dimensions of the meaning of grandparenting emerged: As a "valued elder," "immortality through clan, "responsible for family well-being," "reinvolvement with the personal past," and "indulgence.

Finally the most surprising result of role meaning and grandparent role satisfaction. In this study role meaning was positively correlated with role satisfaction (r = .53) (p = 0.05) and was found to be a predictor of role satisfaction in the regression model (ß = . 2.62, P = .001). These analyses showed that role meaning was strongly associated and important factor contributing to elevating the grandparent role satisfaction in the Kermanshah population. The finding supports Hayslip *et al*., (2003) study that found a role meaning correlated positively and predictably with grandparent role satisfaction. Also role meaning was found to have a significant relationship with role satisfaction, which lends support to the findings of Somary & Strieker (1998), Thiele & Whelan, (2008) reported that role meaning as predictor variable for grandparent role satisfaction. These findings revealed that more meaning a role has for an individual, the more motivated they will be to derive satisfaction from that role.

Conclusion

The result of this study reveals that role meaning, especially in non-custodial grandparents is a significant predictor of role satisfaction. It is noteworthy role meaning becomes important to role satisfaction because grandparents need to make sense of their experience in order to feel satisfied with the role. Considerate predictors of role satisfaction may help us to understand how to encourage positive family relations between grandparent and grandchildren and also increasing feeling satisfaction in grandparents. It is expected that, in general, grandparents with the fulfilling role of grandparenthood can achieve the greater role satisfaction.

References

Ahmadi, Batoul, Alimohamadian, Masoumeh, & Mahmoodi, Mahmood. (2006). Polypharmacy among older adults in Tehran. *Tehran Univ Med J*, 64(9), 55-64.

Annamoradnejad, R., & Lotfi, S. (2010). Demographic changes of nomadic communities in Iran (1956-2008). *Asian Population Studies*, 6(3), 335-345.

Bowers, B.F., & Myers, B.J. (1999). Grandmothers providing care for grandchildren: Consequences of various levels of caregiving. *Family Relations, 48*(3), 303-311

Falk, U.A., & Falk, G. (2002). Grandparents: A new look at the supporting generation. New York,: Prometheus Books.

Forsyth, C. (1994). An examination of age, familial roles, and sex differences in levels of subjective well-being of grandparents. *International journal of sociology of the family, 24*(2), 69-84.

Ghazi-Tabatabaei, M., & Karimi, Z. (2011). Socio-demographic, economic and structural correlates of intergenerational support of the elderly in Iran. *Ageing International, 36*, 428-444.

Harper, S., & Levin, S. (2005). Family care, independent living and ethnicity. *Social Policy and Society*, 4(2), 157-169.

Hayslip B, Henderson CE, Shore RJ. The structure of grandparental role meaning. *J Adult Dev.*2003;10(1):1–11.

Kiani, S., Bayanzadeh, M., & Tavallaee. (2010). The Iranian population is graying: Are ready? *Archives of Iranian Medicine, 13*(4), 333- 339.

Kivett V. (1991)The grandparent–grandchild connection. *Marriage and Family Review. ;*16:267–290.

Kivnick, HQ. (1980). Grandparenthood-what it means to grandparents. Paper presented at the gerontologist.

Muller, Z., & Litwin, H. (2011). Grandparenting and psychological well-being: how important is grandparent role centrality? European Journal of Ageing, 8(2), 109-118.

Peterson, C.C. (1999). Grandfathers' and grandmothers' satisfaction with the grandparenting role: seeking new answers to old questions. *International Journal of Aging and Human, 49*(1), 61-78.

Reitzes, D.C., & Mutran, E. J. (2004). Grandparenthood: factors influencing frequency of grandparent-grandchildren contact and grandparent role satisfaction. *The Journals of Gerontology: Social Sciences, 59*(1), 9-16.

Smith, P.K. (1991). *Introduction: The study of grandparenthood. In P. K.Smith (Ed.),The psychology of grandparenthood*. London: Psychology Press, Routledge.

Somary, K., & Strieker, G. (1998). Becoming a grandparent: A longitudinal study expectations and early experiences as a function of sex and lineage. *The Gerontologist,* 38(1), 53-61.

Thiele, D.M., & Whelan, T.A. (2008). The relationship between grandparent satisfaction, meaning, and generativity. The International Journal of Aging and Human Development, 66(1), 21-48.

Thomas, J. L. (1986a). Age and sex differences in perceptions of grandparenting. Journal of Gerontology, 41(3), 417-423.

Thomas, J.L. (1986b). Gender differences in satisfaction with grandparenting. Psychology and Aging,, 1, 215-219.

Thomas, J.L. (1989 b). Gender and perceptions of grandparenthood. *The International Journal of Aging and Human Development, 29*(4), 269-282.

Uhlenberg, P., & Kirby, J.B. (1998). *Grandparenthood over time: Historical and demographic trends Handbook on grandparenthood* (In M.E. Szinovacz (Ed.) ed.). Westport, CT: Greenwood Press.

United Nations. (2009, Sept 18, 2009). World Population Ageing: 1950-2050, Countries of area: Iran (Islamic Republic of). Retrieved June 30, 2010, from http://www.un.org/esa/population/publications/worldageing19502050/pdf/113 i0ran(pdf).

Villar, Feliciano, Triadó, Carme, Pinazo-Hernandis, Sacramento, Celdrán, Montserrat, & Solé, Carme. (2010). Grandparents and their adolescent grandchildren: Generational stake or generational complaint? A study with dyads in Spain. *Journal of Intergenerational Relationships, 8*(3), 281-297.