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(a quarterly journal devoted to research on ageing)

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OBITUARY



PROFESSOR UDAI JAIN

(18 October 1941-26 March 2022)

The members of the Executive Committee of the Indian Gerontological Association, members of the Editorial Board of the Indian Journal of Gerontology (IJG), and the members of the Executive Committee of Philosophical Praxis, Counselling and Spiritual Healing Society, Jaipur (Rajasthan) (PPCSHC) extend their heartfelt condolences on the sad demise of Professor Uday Jain, former Professor and Head of the Department of Psychology, Barkatullah University, Bhopal, Madhya Pradesh, India and former **Vice-Chancellor of A.P.S. University Rewa, M.P.**

Dr. Jain was associated with the IJG since its inception and was also the Vice-President of PPCSHC. His absence will be felt everyday and this tribute is a humble homage to the man who was a beacon of light to the academic community.

Dr. Jain was a changemaker and throughout his life strived to bring about a positive change in society. After his M.A. in Psychology from Dr. Harisingh Gaur University, Sagar Dr. Jain was appointed as an Assistant Prof. at the University of Rajasthan, Jaipur, and subsequently obtained his Ph.D. from the same university. In his teaching career, he taught at numerous universities in Delhi, Allahabad, Rohtak, Jonpur, and Aligarh.

Not only was he a beloved professor to his students he also constantly sought new challenges. His ICCSR project on – *Competition tolerance and Need hierarchy as related to Population Density* (1973) pioneered environmental psychology in India. Over

the course of his life, He contributed more than 100 research papers in Reputed Research Journals in India and abroad and 30 Chapters in edited books, in the area of *Social and Environmental psychology*. He was the author of *Psychological Consequences of Crowding* (Sage Publication); *The Feeling of Crowding and its Psychological Consequences*; *Extreme Response Style as a Personality Factor* and has edited: *Perspectives on Psychology and Social Development and Perspectives on Environment and Behaviour*. His research on 'crowding' has been cited in many textbooks of Environmental Psychology published in the USA, and the UK.

He was also on the editorial board of the *Asian Journal of Environment and Behaviour* published in Malaysia. He was the Principal co-investigator of CIDA-Shastri Indo-Canadian project on *Community and Regions Overcoming Ecological Crises* in collaboration with Simon Fraser University and the University of British Columbia. In 2012, he was invited to deliver a keynote address in an International Seminar on Environment and Behaviour. Besides his academic pursuits, Dr. Jain contributed to the area of rural development by consulting NGOs including MP Gyan Vigyan Samiti on the popularization of science. Some of his noted works include *Socio-psychological and economic issues in Rural India-Women and Panchayati Raj* (1996-1998); *Impact of Micro-finance on Socio-economic Status* (1999-2001); *Effects of Domestic Violence on Reproductive Health* (2005); *Decentralization and capacity assessment of Panchayats* (2007).

In the year 2014, Dr. H.S. Gaur University, Sagar conferred "Gaurav Samman" to him. Dr. Jain lived a full life and until his death contributed to the community in many ways. Before his sad demise, he was working with school children and teachers to address the issue of corporal punishment and other rights of children. We thank you Dr. Udai Jain for your contributions.

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NEWS & VIEWS

ATTENTION PLEASE

Those who are interested in becoming a member of *Indian Gerontological Association* (IGA) are requested to send their Life Membership fee, ₹ 2000/- (Rupees Two Thousand). Membership fee is accepted only by D.D. in favour of Secretary, Indian Gerontological Association or Editor, Indian Journal of Gerontology or you may transfer directly in IGA's Bank Account. Life Membership is only for 10 years.

REQUEST

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Comparison of Square Stepping Exercises and Foam Stability Exercises on Falls in Community-Dwelling Elderly

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Maseeh Qureshi***

Department of Community Physiotherapy,
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ABSTRACT

Increased risk of falls in the elderly leads to activity restriction eventually causing the capacity to decline and further falls. The objective of this study was to compare the effect of Square Stepping Exercises and Foam Stability Exercises on the risk of falls. Sixty-six community-dwelling elderly, 65 years and above (males=29 and females=37), of Pune city, were selected for this study. All participants were divided randomly into two groups. Group 1 (Males=16; females=17) received Foam Stability Exercises and Group 2 (males=13; females=20) received Square Stepping exercises 5 times a week for 4 weeks. Berg Balance Scale was used to assess the risk of falls and the Fall Efficacy Scale-international was used to assess fear of falls. Outcome measures were taken pre and after four weeks of intervention. The findings revealed that both the groups showed statistically significant improvement after the interventions in scores of Berg's Balance Scale ($p<0.005$) and Falls Efficacy Scale- International ($p<0.005$). However, the between-group comparison showed that group 2 had more improvement in both the measures. Based on the findings of

this study, it may be concluded that Square Stepping Exercises when performed for 4 weeks showed better improvement in reducing risk and fear of fall in community-dwelling elders as compared to foam stability exercises.

Keywords: Berg balance scale, Community-dwelling elderly, Foam Stability Exercises, Fear of Fall, Square Stepping Exercises.

Ageing is the progressive accumulation of changes with time associated with or responsible for the ever-increasing susceptibility to disease and death. This fundamental process affecting all our systems and tissues may be common to all living things (Bhanusali, *et al.*, 2016) The prevalence of risk of falls ranges from 26 per cent to 37 per cent among elderly >60 years of age in India (Joseph, *et al.*, 2019) Balance depends on cognitive performance, efficient vestibular feedback, and other environmental factors. Several systemic changes lead to a decrease in functional ability in the elderly which is directly linked to an increased risk of falls in older individuals (Pereira, *et al.*, 2014) single fall often results in fear of falling, which leads to a loss in one's ability to perform routine tasks, restriction in activities, social isolation, and increased dependence on others.

Implementing effective intervention strategies could reduce both risk and the rate of falling, decrease the incidence of falls and reduce associated healthcare costs. Intervention suggested by many researchers for improving balance and reducing falls includes multi exercise modalities and comprehensive intervention. It includes high and low-intensity muscle strengthening and endurance training, aerobic exercises, flexibility training, correcting posture, gait training exercises, tai-chi, and home exercise programme (Avers, D. and Wong, R., 2000).

Square stepping exercises (SSE) and Foam stability exercises reduce the risk and fear of falls in elderly individuals, since both the protocols aim to reduce the risk of falls and improve balance, both the approaches differ in the surface stability. Foam stability exercises incorporate an unstable surface and square stepping exercises are done on a stable surface by walking on the mat in multi-directional patterns. As both these protocols have not been compared to see which one is more effective, their comparison will help in giving a better idea to reduce the risk and fear of falls in community-dwelling elderly.

METHODS

Sample

After taking approval from the institute's (M A Rangoonwala College of Physiotherapy, Pune, India) ethics committee letter-number MARCOPAR/05/68/a Dated 04/03/21, an experimental study was started. Sixty-six elderly, aged 65 and above, living in a community in Pune city, India, were randomly selected for the study. Written informed consent was taken from all the participants after explaining the purpose and the procedure of the study.

Community-dwelling elderly, both males (N=29) and females (N=37) who were able to walk with or without an assistive device having fear of falls with a score of 16 - 27 on the Falls Efficacy Scale International (FES-I) Questionnaire were included in the study. Elderly indulged in any type of medical or physical therapy intervention for the treatment of falls, any musculoskeletal injuries or surgeries affecting lower limbs in the past 3 months, progressive neurological disorders like Parkinson's, multiple sclerosis, and vestibular disorders like BPPV or vestibular neuritis were excluded from the study.

Subjects were assigned randomly by chit method to either foam stability exercises (Group 1) or square stepping exercise group (Group 2). They were evaluated pre and post-four weeks of intervention for Risk of Fall using Berg's Balance Scale (BBS) and Fear of Fall using Falls Efficacy Scale International (FES-I). The number of subjects included in each group was 33. There were three dropouts in Group 1 and one dropout in Group 2 as they were not consistent with the protocol. Both the groups received the treatment 5 days a week for 4 weeks.

Tools used

1. Bergs Balance Scale:

The BBS was developed as a performance-oriented measure of balance in elderly individuals. The maximum total score of the test is 56, where 41-56 is considered a low risk of falls, 21- 40 a moderate risk of falls, and less than 20 a high risk of falls. It has a reliability intra-class correlation coefficient (ICC) of 0.98 and a validity = of 0.91 (Berg Katherine, *et al.*, 1989).

2. Falls Efficacy Scale International Questionnaire:

Fall Efficacy Scale - International (FES-I) assesses fear of falls in the elderly. Individuals are asked to rate their concerns about the possibility of falling when performing 16 activities. Individuals are instructed to rate each activity regardless of whether they perform it. The scores are added up to calculate a total score that ranges from 16 to 64, where 16-19 is considered a low fear of falls, 20-27 a moderate fear of falls, and more than 27 a high fear of falls. It has a reliability of 0.96 and validity of 0.691 (Arora, P., *et al.*, 2016).

Intervention

Foam Stability Exercises (Hirase, T., *et al.*, 2015).

High density closed cell Foam rubber pad of 34.2*40*5 cm dimensions, was used for giving foam stability exercises. Subjects were instructed to perform exercises in a standing position on a foam rubber pad. External support in maintaining balance was provided if required. Progression of the protocol was done by increasing each set of exercises every week.

Table 1

Foam stability exercise protocol

EXERCISE	DESCRIPTION
1. Double Stance Standing	- Stand with a normal base of support. - Hold this position for 20 seconds. - Repeat twice with eyes open and eyes closed.
2. One-Leg Standing	- Stand on one leg while the other leg is off the ground. - Hold for 10 seconds. - Repeat three times on each leg, once with eyes open and twice with eyes closed.
3. Bending neck forward and backward	Bend the neck slowly forward and backward, repeat five times with eyes open, five times with eyes closed.

- | | |
|----------------------------|--|
| 4. Free-leg swinging | <ul style="list-style-type: none"> • Stand on one leg while moving the other slowly to the front, sideways, and backward. Repeat the same on the other leg. • Repeat three times with eyes open and three times with eyes closed. • Initially, participants may slide feet over the floor, once confident they should try to completely lift the leg off the floor. |
| 5. Heel and toe raise | <ul style="list-style-type: none"> • Stand on both the legs. Raise heel and toe alternately. • Repeat three times with eyes open and three times with eyes closed. |
| 6. Neck and trunk rotation | <ul style="list-style-type: none"> • Stand while slowly rotating the neck and trunk to one side and slowly to the other side. • Repeat three times with eyes open. |
| 7. Marching in place | <ul style="list-style-type: none"> • March in place for 20 seconds. • Repeat it twice with eyes open. |

Square Stepping Exercises(Shigematsu, R., *et al.*, 2008). Square Stepping exercises (SSE) were performed on a mat (100*250 cm) that was partitioned into 40 squares (25 cm each). The subjects were instructed to walk (step) from one end of the mat to the other according to the step pattern provided. When the subject reached the end of the mat, they were instructed to return to their start positions by walking normally off the mat and then standing at the starting point for the next repetition. The subject was provided with external support in maintaining balance if required. It included 4 patterns Elementary-1, Elementary-2, Intermediate-1, and Advanced-3 which were performed by subjects for 4 weeks with the weekly progression of each pattern. Each step pattern was repeated 10 times and it was ensured that the subject completes the pattern. The subject was encouraged to successfully perform each progressively more complicated step pattern. The instruction was given to the subjects to perform the exercise at their preferred pace.

Figure 1*Square Stepping Exercise*

Elementary 1	Elementary 2	Intermediate 1	Advanced 3
	   	  	   
	   	  	   
	   	  	    
	   	  	    
	   	  	   
	   	  	   
	   	  	    
	   	  	    
	   	  	   
	   	  	   

Statistical Analysis

The data was collected pre and after four weeks of intervention.

All data were entered into a computer by giving a coding system and proofed for entry errors.

Data obtained was compiled on an MS Office Excel Sheet (v 2019, Microsoft Redmond Campus, Redmond, Washington, United States).

Statistical analysis was done using the Statistical Package for social sciences (SPSS v 26.0, IBM).

The normality of outcome numerical data was checked using the Shapiro-Wilk test & was found that the data did not follow a normal curve; hence non-parametric test was used for comparisons. Median was considered for intra-group and inter-group comparison as the data was skewed and did not follow a normal curve.

Intergroup comparison (2 groups) was done using the Mann-Whitney U test.

Intra group comparison was done using Wilcoxon Signed rank test (up to 2 observations)

For all the statistical tests, $p < 0.05$ was considered to be statistically significant.

Results

Table 2

The Subjects in two groups.

Group	N	Mean	Std. Deviation	Std. Error Mean	t value	p-value
AGE 1	33	70.63	6.690	1.183	.514	.609#
2	33	69.89	5.028	.850		

$p > 0.05$

Distribution as per gender

Table 2, shows the age of the individuals in both groups. The mean age of group 1 was 70.63 ± 6.690 and group 2 was 69.89 ± 5.028 .

Table 3

Inter-group comparison on frequencies of subjects as per

	GENDER			Chi-Square value	p-value
	F	M	Total		
Group 1	17	16	33		
2	20	13	33	0.651	0.420#
Total	37	29	66		

$p > 0.05$

Table 3, shows an inter-group comparison of frequencies of subjects as per gender. In group one there were 17 females and 16 males while in group two, 20 females and 13 males were included.

Table 4

*Intra-group comparison of FES-I (Foam Stability Exercises Group 1)
(n = 30)*

Group	Std. Deviation	Median	Z value	p-value
FES PRE	3.332	22	-4.836	0.000**
FES POST	2.750	20		

** $p < 0.05$

Table 5

*Intra-group comparison of BBS ((Foam Stability Exercises Group 1)
(n = 30)*

<i>Group</i>	<i>Std. Deviation</i>	<i>Median</i>	<i>Z value</i>	<i>p-value</i>
BBS PRE	2.155	44	-4.344	0.000**
BBS POST	1.978	45		

** p<0.05

As per Table 4 & 5 Intra Group comparison of FES-I and BBS for Foam Stability Exercises (Group 1) p<0.05 which indicates there was a statistically significant difference post intervention in the scores of FES-I & BBS.

Table 6

*Intra-group comparison of FES-I (Foam Stability Exercises Group2)
(n = 32)*

<i>Group</i>	<i>Std. Deviation</i>	<i>Median</i>	<i>Z value</i>	<i>p-value</i>
FES PRE	2.577	25	-4.891	0.000**
FES POST	2.906	22		

** p<0.05

Table 7

*Intra-group comparison of BBS ((Foam Stability Exercises Group2)
(n = 32)*

<i>Group</i>	<i>Std. Deviation</i>	<i>Median</i>	<i>Z value</i>	<i>p-value</i>
BBS PRE	3.663	45	-4.906	0.000**
BBS POST	2.971	48.5		

** p<0.05

Table 6 & 7 shows an Intra-Group comparison of FES-I and BBS for Group 2(square step exercise). The p<0.05 indicates the statistically significant difference in FES-I & BBS scores post intervention.

Table 8

Inter-group comparison of FES-I

<i>Group</i>	<i>N</i>	<i>Std. Deviation</i>	<i>Median</i>	<i>Mann-Whitney U value</i>	<i>Z value</i>	<i>p-value</i>
FES POST 1	30	2.750	20	329.000	-2.148	0.032*
2	32	2.906	22			

* p<0.05

Table 9
Inter-group comparison of BBS

Group	N	Std. Deviation	Median	Mann-Whitney U value	Z value	p-value
BBS POST1	30	1.978	45	207.000	-3.875	0.000**
2	32	2.971	48.5			

* $p < 0.05$

In Tables 8 & 9, an inter-group comparison between the Foam Stability exercises and Square Stepping exercises for FES-I & BBS is shown. It shows that post-intervention values in Square Stepping Exercises (Group 2) are significantly better as compared to Foam Stability Exercises (Group 1).

Discussion

The present study was conducted to compare the effect of Square Stepping Exercises versus Foam Stability Exercises on risk and fear of falls in community-dwelling elders.

According to Tables 4 and 5 when FES-I and BBS were assessed it showed statistically significant improvement in Group 1 (Foam Stability Exercises).

Improvement can be attributed to Foam Stability Exercises as this exercise not only stimulate somatosensory, visual, and vestibular systems which have a positive effect on risk and fear of fall but also improves the balance ability necessary for maintaining a standing posture. Movements on a foam rubber pad affect the skin receptors in the soles and mechanoreceptors in the joints and muscles and provide useful proprioceptive information for postural reactions (Hirase, T, *et al.*, 2015). Similar results were found in a study that says that because of unstable surfaces there is an increase in postural sway which further increases afferent inputs from the mechanoreceptors present in the feet. This helps to stimulate the postural reflexes, thus increasing the muscle activities to maintain the stability of the body, leading to a significant reduction in the risk of falls (Granacher, U., *et al.*, 2006).

According to Tables 6 and 7, statistically significant improvement was seen post Square Stepping Exercises in scores of FES-I and BBS in Group 2.

During Square Stepping Exercises multidirectional steps are taken by the elderly that helps increase the activation of the postural muscles. It improves hip and ankle synergies as there is the continuous displacement of the center of gravity. Which acts as continuous feedback for multidirectional postural responses. It consequently helps in improving many aspects of the functional fitness of the lower extremities and significantly increases the muscle strength.⁸ thus improving functional mobility and reducing the risk of falls (Susan B. O'Sullivan., *et al.*, 2014).

The results of this study are supported by Shigematsu R., *et al.*, (2008) who suggest that increase in the functional balance of the elderly could be associated with the plastic changes that occur in the neuromuscular system which result from repeated activation of the somatosensory, visual, vestibular, proprioceptive and sensory inputs. It is also assumed that square stepping exercises help to enhance neural function by reducing response latency, effectively recruiting postural muscles, and improving the interpretation of sensory information (Ibid).

Square stepping Exercises involve movements that require the integration of cognitive and motor task to perform the correct sequence and some level of proprioceptive development. It improves neuromuscular function and coordination as a protective response to falls which helps in improving the confidence of elders, reducing the fear and risk of falls in the elderly (Ibid). the results of this study are supported by the study of Shigematsu, *et al.*, (2008) which concludes that square step ex was as effective in improving lower-extremity performance and in preventing falls in older community-dwelling people, and reducing the number of disabilities. When the results of both the groups were compared as seen in Table 8 and 9, it showed that exercises given to Group 2 (Square Stepping Exercises) were more effective in reducing fear and risk of falls in elderly in comparison with Group 1 (Foam Stability Exercises).

Foam Stability Exercises were significantly effective in reducing the risk and fear of falls as this exercise method can stimulate the somatosensory system by probable activation of the mechanoreceptors in the ankle joint (Hirase, T., *et al.*, 2015). At the central level, regular physical activity and exercise are thought to change proprioception

through the modulation of muscle spindle gain and the induction of plastic modifications in the central nervous system. During the physical activities, an increase in the muscle spindle output through the gamma route is observed, which facilitates the cortical projection of proprioception after which sensory convergence takes place (Fisseha, B., *et al.*, 2017). The ankle strategy is also effective at keeping the trunk in a vertical position during small perturbations while standing. Moreover, the ankle strategy depends more on accurate somatosensory information. Since the surface is unstable it helps in improving ankle strategy to maximum and giving better results (Nam HC, *et al.*, 2016).

The Square Stepping exercises and Foam Stability exercises are effective in reducing risk and reducing risk and fear of falls in the elderly as SSE not only improves the somatosensory, visual, and vestibular systems but also improves the motor and cognitive function thereby, helps in enhancing the lower extremity muscle strength and dual-task performance in these individuals (Carter, N., *et al.*, 2001 and Hauer, K., *et al.*, 2001.).it also involves quick, multi-directional movements, heel lifts, and smooth transfers of weight, which all contribute to improving balance, agility, and walking speed. Significant improvement in these parameters may also help in the prevention of falls (Guideline, 2001).

Whereas the Foam Stability exercises improve the proprioception by enhancing the skin receptors and the mechanoreceptors in the joints and muscles thereby providing adequate feedback and reducing the risk of falls (Astha Jain, and Chaitali Shah, 2017).

The square stepping exercise is a more feasible alternative for older people as it is portable and cost-effective, and also has the additional advantage of being unaffected by weather, space, or availability of time; SSE can be performed at home, in community centres, or in parks. Therefore, intervention strategies that prevent falls in the elderly population will not only enhance their ability to remain active within the community but also avoid additional health care problems due to injurious falls, and hence such interventions can be incorporated in reducing the risk and fear of falls in community-dwelling elderly.

There are certain limitations observed in this study like an assessment of proprioception and muscle strength was not assessed

as these were the important factors in improving balance, also the selected population was having low to moderate risk of falls while subjects with a high risk of falls were not included in this study.

Conclusion

Based on the findings of the present study it may be concluded that 4 weeks of Square Stepping Exercises proved to be more effective statistically in reducing the risk and fear of falls in community-dwelling elderly compared to the Foam Stability Exercises.

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Effect of Prone Traction, Abdominal Strengthening and Surged Faradic Current in Lumbar Canal Stenosis- A Case Report

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ABSTRACT

Lumbar canal stenosis is the most common cause of lumbar spine diseases in patients over 65 years of age. This case study presents the effectiveness of prone traction, Surged Faradic current, Phonophoresis, and Core strengthening exercises on a patient with LCS (Lumbar canal stenosis). A 72-year-old male, suffering from low back pain (pain intensity -8 on Numerical pain rating scale-NPRS) and neurological claudication (symptoms appear after 2 minutes of walking) was the subject of this study. Investigation revealed Ligamentum flavum (LF) hypertrophy at the lumbar level. On palpation, we found a spasm of para spinal muscles. Manual muscle testing (MMT) of the Gluteus Maximus was grade 3. A reduced range of lumbar flexion was found. The researchers gave the patient traction in the prone position. Also worked on abdominal muscle and gluteus maximus muscle strengthening, which is generally ignored. Along with that Surged Faradic (SF) current on paraspinal muscles and phonophoresis at the site of LF thickness was also given. It was found that the patient was able to walk for 15 minutes

without experiencing any symptoms after following this 8-day intervention strategy, and the level of pain was reduced to a 4 on the Numeric pain rating scale (NPRS). Based on present findings it may be concluded that the prone traction, core muscle strengthening exercises, phonophoresis for LF hypertrophy, and SF for paraspinal muscle spasm all together had tremendous effects on our patient with LCS.

Keywords – Lumbar canal stenosis, Prone traction, Surged faradic current, Abdominal strengthening,

In patients over the age of 65, lumbar canal stenosis is the most common cause of lumbar spine diseases. Lumbar canal stenosis is described as a narrowing of any vertebral canal, foramina, or lateral recess that causes compression of neurovascular systems inside the lumbar canal and results in a clinical presentation of low back pain that can radiate to the lower extremities (Hennemann, and Abreu, 2021). Neurogenic claudication, myeloradiculopathy symptoms, sensory abnormalities, motor weakness, and pathologic reflexes are symptoms of lumbar canal stenosis. Cramping pain in the thigh, calf, and/or buttocks may also be reported by patients. They may have more pain while walking or standing for lengthy periods, but alleviation when sitting or leaning forward (Raja, *et al.*, 2021). Symptomatic LCS is often characterized as neurogenic claudication, which includes back discomfort, weakness, numbness, and/or weariness that radiates to the buttock, thigh, or lower leg. The lack of valid clinical or x-ray criteria makes the diagnosis more difficult (Trigg, and Devilbiss, 2017). For years, mechanical lumbar traction has been utilised to treat spinal problems and low back pain. Patient comfort and muscular relaxation are considered important for achieving the most favorable benefits of traction. Filiz,*et al.*, (2018) found that during traction, sacrospinal muscles were relaxed in both the supine and prone positions, and muscular activity was considerably lower in the prone position than in the supine. As a result, it's rational to believe that lumbar traction in the prone position would be significantly more effective for people with low back pain (Ibid). For the treatment of chronic lumbosacral radiculopathy, lumbar traction in the prone lying position is more successful than lumbar traction in the supine resting position(Khan, *et al.*, 2021). So we think it can be effective in LCS. Core strengthening is commonly used for lumbar

spine injury prevention and rehabilitation. The spine requires core musculature to move easily throughout its complete range of motion, and it also connects the upper and lower extremities, serving as a functional hub of the kinetic chain (Kennedy, and Noh, 2011). Surge faradic current is a type of electrical muscle stimulation that uses a 0.1 to 1 ms pulse duration and a frequency of 30-100 Hz. (Seju, and Rajput, 2021) Electrical currents lessen the degree of muscle spasm (Shinde, and Shevalkar, 2021). Our ultimate goal is to use all these treatment approaches to reduce the pain of the patient and decrease the time duration of neurological claudication.

Patient Information.

Mr. O, a 72 years old Retired officer, had low back pain and neurological claudication for 8 months. He visited the Orthopedic department, where investigations were done and medications were prescribed. The patient found relief until the medications were going on, as 2-3 months passed by he started experiencing pain again and then he consulted Physiotherapy for the same. Symptoms of neurological claudication appear after 2 minutes of walking. The outcome measures included a Numerical rating scale for chronic back pain and long-standing. NPRS score for low back pain after 2 min of walking and standing was 9/10 on NPRS .

Diagnostic assessment

MRI relieved Diffuse disc bulge and hypertrophy of Ligamentum flavum at L2-L3, L3-L4, and L4-L5 levels. At the L3-L4 level compression of the thecal sac was also found causing Mild canal stenosis.

Therapeutic Intervention

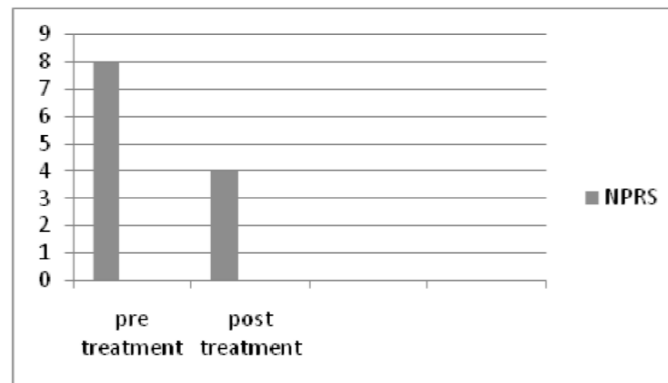
Firstly the treatment strategies were explained to the patient. The treatment session began with 20 minutes of the hot pack for the low back, hamstrings, and calf muscles (7 min) followed by Phonophoresis by Piroxicam Gel for 6 minutes at the lumbar region from the L2-L5 level. After that Surged Faradic current was applied to the paraspinal muscle in the lumbar and thoracic region for 6 minutes each (5 sec On, 4 sec off) soon after that we started with exercises which included Single leg knee to the chest of both Lower

limb, double leg knee to chest, spinal rotation. 10 repetition of each exercise was taken. Dorso lumbar fascia stretch was given to the patient by the therapist. Abdominal contraction exercises with breathing techniques were taught to the patient. We asked him to hold the contractions for 5-10 sec for 10 repetitions. Followed by the lifting of one leg with abdominal contraction in later sessions. The hamstring released was given by using the marble technique. The marble was placed at the center point of the plantar fascia for 60 seconds of 3 sets. We ended the exercise session by strengthening the gluteus Maximus using theraband (exercises) in a standing posture for 10 repetitions. Anterior pelvic tilting correction was done by the therapist. Lastly, we applied Static Traction at the lumbar region in the prone position for 10 minutes. The treatment session lasted for one and a half hours.

**Abdominal strengthening****Prone traction****Surged faradic current**

Follow-up and Outcome Measures

The Numerical Pain Rating Scale (NPRS) and Range of Motion (ROM) were employed as outcome measures. The treatments had a considerable impact on pain reduction. The pain intensity reduced from 8 on NPRS to 4 on NPRS. There was an increase in the ROM of the lumbar flexion. Before treatment, the symptoms of neurological claudication in the patient would appear within 2 minutes of him walking. After treatment, the patient could walk around for 15 to 20 minutes without any symptoms resurfacing.



Graph showing the NPRS Score.

DISCUSSION

Cyriax defined traction as having three favourable effects: a distraction to increase intervertebral space, tensing of the posterior longitudinal ligament to exert centripetal force at the back of the joint, and suction to bring the protrusion toward the centre of the joint (Bushati, and Erindi. 2020). Lumbar traction is thought to reduce noxious stimulations by reducing the lordotic curve, increasing intervertebral space, and reducing muscle spasm and spinal nerve root pressure. According to previous research, the prone line posture allows for more apparent intervertebral separation and a reduction in muscular tension (Khan, *et al.*, 2021). Electrical currents reduce muscular spasms by lowering the

sensitivity of the muscle spindle system, removing the mechanical and chemical processes that stimulate pain transmission. As muscle spasms are reduced, the restricted ROM rises. In a previous study, Surged Faradic Stimulation in ROM resulted in significant improvement in subjects with myofascial trigger points of the trapezius (Shinde, and Shevalkar, 2021). Phonophoresis is a method of delivering therapeutic drugs, mainly topical analgesics or steroids, to deeper tissues through the application of high-frequency sound waves (i.e., ultrasound). In their study, Durmus, *et al.*, (2013) reported that patients with persistent low back pain who received phonophoresis saw significant improvements in pain, extensor muscle strength, and walking performance (Ibid). Active exercise may assist maintain a better posterior pelvic tilt by increasing lumbopelvic muscle stabilization (Mazanec, D., *et al.*, 2002). The core has received special attention because it acts as a muscular corset, stabilising the body and spine both with and without limb movement. If simply put, the core is the functional kinetic chain's focal point (Akuthota, and Nadler, 2004). Gluteus medius is weaker in persons with LBP. Persons with low back pain have more palpation soreness in the gluteal, greater trochanter, and paraspinal (Cooper, *et al.*, 2016). The thoracolumbar fascia acts as "nature's back belt". It acts as a retinacular strap for the lumbar spine muscles. That's why we concentrated on providing a thoracolumbar fascia stretch to our patients (Akuthota, and Nadler, 2004). Thus all these various approaches backed by evidence support our treatment strategy to treat lumbar canal stenosis.

Conclusion

This research looked into the impact of Prone traction, Surged Faradic current, Phonophoresis, and Core strengthening exercises on a patient with LCS. The treatments had a considerable impact on pain reduction. The pain intensity reduced from 8 on NPRS to 4 on NPRS. There was an increase in the Range of Motion (ROM) of the lumbar flexion. Before treatment, the symptoms of neurological claudication in the patient would appear within 2 mins of him walking. After treatment, the patient could walk around for 15 to 20 minutes

without any symptoms resurfacing. Thus we conclude that this treatment protocol was effective in improving the quality of life of the patient with lumbar canal stenosis

Limitations and Recommendations

As this is a case report, the results cannot be extrapolated to larger sample size. To better understand the utility of this treatment protocol in patients with lumbar canal stenosis, more research is needed.

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Effect of age on Hand Dominance in Healthy Population of 60 to 80 years: An Observational Study

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ABSTRACT

With increasing age, a decline in hand movement coordination occurs, which can lead to a decreased ability to carry out everyday activities. 103 elderly persons both male and female of age 60 to 80 years, were randomly selected from an old age home to study hand differences in their task performance (Hand Dominance). Edinburgh Handedness Questionnaire (EHQ) was used to check hand dominance. This questionnaire contains one question about the hand you preferentially use for writing and ten questions about your hand preference for other activities. Hand-Held Dynamometer (HHD) was also used to check right and left-hand grip strength and was measured in kilograms. After analyzing the responses from the participants of the study, it was found that there is no correlation between age with hand dominance ($r = 0.108$). The correlation value between age and right and left-hand grip strength was documented as 0.434 and 0.403 respectively. The mean and standard deviation of EHQ were 485.19 and 15.03 respectively. The mean and Standard deviation of the right and left-hand grip strength (measured in kg) was 12.21 and 10.45 respectively, which was obtained using SPSS version 23. Based on the present findings it may be concluded that there is no correlation between age with hand dominance and handgrip strength. Hand dominance does not change with the advancing age.

Keywords : Hand dominance, Handgrip strength, Edinburgh handedness questionnaire, Elderly population, Ageing.

Handedness/Hand dominance can be defined as the partiality or hand difference in task performance (Kalisch, T., 2006). With increasing age, a decline in hand movement coordination occurs, which can lead to a decreased ability to carry out everyday activities (Ibid).

The dominant hemisphere is the one to run a given function (Dragovic, M., and Hammond, G. A., 2007). Preferred spontaneous use of the right hand, for example, is an expression of left-hemispheric dominance of motor function, mostly called right-handedness (Dragovic, M., and Hammond, G. A., (2007). The argument for earlier mortality in left than right-handers depends on the premise that relative prevalence has not changed over this century (Annett, M., (1996). Inconsistent preferences used to be assigned to social pressures on natural left-handers, but this does not account for left writers who prefer the right hand for other actions (Ibid).

However, the neural mechanism underlying differential hemispheric lateralization of face perception in right and left-hander are mostly unknown (Frässle, S., *et al.*, 2016). A brain function is said to be dominant if a unilateral lesion manufactures a behavioural deficit that extends over both sides of the body or personal space (Moll, J., and de Oliveira-Souza, R., 2017). Dominance and submissive behaviours serve to modulate aggression and conflict while ensuring that the dominant individual generally has the first approach to the resources that garner the greatest reproductive success. Individuals with high dominance motivation are more on to engage in dominance behaviours (Johnson, SL., *et al.*, 2012).

Handedness is particularly interesting to investigate in older adults given that hand preference differs in young and older adults and this may have an impact on motor cortical representations (Incel, NA., *et al.*, 2002). Considerable bilateral brain activation is seen in left and less strongly handed individuals (Ibid). Changes in different structures or physiology of the brain wander to disorders that can affect upper limb function⁽⁸⁾ Completing a given job by hand in the elderly population needs the activation of more regions in the brain (Sebastjan, A., *et al.*, 2017).

Handedness is the most important manifestation of behavioural lateralization in the human population (Samosawala, NR., *et al.*, 2016). The problem of mixed handedness is usually wiped under the carpet, along with a statement to the effect that ambidexterity is rare (Ibid). It should be noted that in the current population of older people, the majority proclaimed that the right hand is dominant (Ibid). Without thorough research, we cannot say whether similar procedures occur in people who are left-handed and if these changes are the same or greater than in the occurrence of right-handed people (Ibid). Hence, it requires an additional investigation on age-related changes in dominant and non-dominant hand function involving healthy patient populations⁽⁹⁾ This will not only enhance treatment approaches and improve quality of life by restoring impaired hand function but also improve understanding of laterality in old age (Ibid).

The Handheld dynamometry is an objective method in measuring minimum muscle strength change, which has an impact on the physical function (Ibid), small changes in the force can be measured in units of weight such as pounds or kilograms. (Ibid). Due to critical activity, there is a significant lot of muscle mass and strength (Ibid).

To know the mechanism behind handgrip strength, and the contribution of muscle mass and muscle quality to the age-related decline of handgrip strength may be useful to find solutions (Beller, *et al.*, 2019). Similarly, a decrease in muscle mass or muscle quality may be a different factor to determine the strategy for preventing the decline in handgrip strength (Ibid).

METHOD

After the approval from the Institutional ethical committee, the study was conducted among the elderly population. Individuals aged 60–80 years of age, both male and female with Mini-Mental Status Examination Score ≥ 27 were included in the study. Whereas, individuals with any recent musculoskeletal, cardiorespiratory, neurological conditions, or any disability were excluded from the study.

The outcome measures used in this study are Edinburg Handedness Questionnaire (EHQ) and Hand Held Dynamometer (HHD). EHQ determines the hand dominance of the individual and is a reliable and valid tool for assessing hand dominance. HHD is an objective and reliable method used to measure handgrip strength. Participants were selected by convenience sampling from an old age center (Kalisch, T., *et al.*, 2006). They were taken into the examination room, and informed about the purpose of the study, and informed written consent was taken. Participants were informed to sit on the chair comfortably and asked to fill up the Edinburg handedness questionnaire. After that, participants were asked to place the forearm in a mid-prone position with 90 degrees of elbow flexion on the armrest chair and asked to hold the HHD in their hand and press it as much as they can, the readings were taken for the three times and the average value was taken into consideration. HHD was used to measure right and left handgrip strength one after the other (Ibid). All the examined data was properly noted on the data collection sheet.

RESULT

This study analyzed 103 elderly populations between the age of 60 to 80 years (Mean and SD). Shapiro- Wilk test was used to test the normality of the data. For data analysis, Pearson's correlation coefficient test was used.

Table 1

Shows mean and standard deviation of demographic variables, handgrip strength right and left, and Edinburg Handedness Questionnaire.

	Mean	Standard Deviation
Age	68.72	6.453
Dominance	1.15	.354
Hand Grip Strength Right	12.21	5.43
Handgrip Strength Left	10.45	5.39
Edinburg Handedness Score	485.19	15.03

Table 2*Percentage of dominance (right and left) of the participants*

Dominance	No. of participants	Percentage
Right	88	85%
Left	15	15%

Table 3*Correlation of age with hand dominance and right and left handgrip strength.*

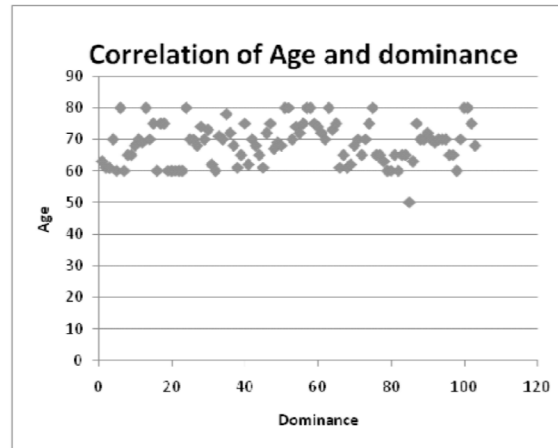
		Dominance	Hand Grip Strength Right	Hand Grip Strength Left	Age
Dominance	Pearson Correlation	1	-.179	-.024	.108
Hand Grip Strength Right	Pearson Correlation	-.179	1	.942**	-.434**
Hand Grip Strength Left	Pearson Correlation	-.024	.942**	1	-.403**
Age	Pearson Correlation	.108	-.434**	-.403**	1

** . Correlation is significant at the 0.01 level (2-tailed).

Table 3 shows the correlation between dominance, age, and handgrip strength right and left. However, the correlation of dominance with handgrip strength both right and left and age is negatively significant. There is a negative significant correlation between age and handgrip strength right and left, which means as age increases hand grip strength will decrease. The correlation between handgrip strength right and left is positively significant. According to this if, the handgrip strength of the right increases then the handgrip strength of the left also increases.

Graph 1

Correlation of age and hand dominance in the healthy elderly population of 60-80 years.

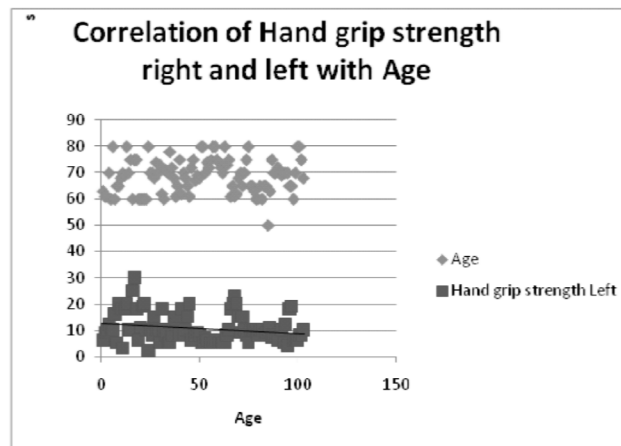


X-axis represents age and Y-axis represents dominance

Graph 1 shows the scatter diagram of the correlation between age and dominance. The above figure shows that there is no correlation between age and dominance.

Graph 2

Correlation of handgrip strength right and handgrip strength left with age.



moves downwards towards the right side which represents there is no correlation between handgrip strength right and left with age.

DISCUSSION

In the present study, we tried to find out the correlation of age with hand dominance and handgrip strength. We took the elderly individuals with a Mini-Mental Status Examination score ≥ 27 . The overall population taken for the study was 103 elderly individuals both male and female as per the inclusion criteria. It was found that as the age increases the handgrip strength of the right and left decreases, which means age is inversely proportional to handgrip strength. But the dominance remains the same with increasing age.

Tobias Kalisch et.al in his experiment used the Edinburg handedness questionnaire for the purpose to know the use of hands mostly for daily purposes(Ibid). They carried out their study in the form of 2 experiments. For experiment no.1 they carried out the motor performance test series(Ibid). And in experiment 2 they carried out the sensory-based assessment of hand use in everyday activities with the score of the Edinburg handedness questionnaire(Ibid). They found that the first experiment on a motor task shows a decline in performance with increasing age(Ibid). And in the case of experiment two, to find out the dominance they calculated laterality indices ranging for each task and parameter where they found the significant negative co-relation(Ibid). There they found an equalization of the use of both hands according to the Edinburg handedness questionnaire(Ibid). The outcome measure used for hand dominance in this study has good results to check the dominance. It can be used in the form of an online survey as well as a physical presence.

Rantanen, *et.al.*, (2003) carried out a study on handgrip strength and cause-specific and total mortality in older disabled women: exploring the mechanism, they carried out the study on 919 moderately to severely disabled women aged 65 to 101(Kuh, D., *et al.*, 2019). He found that nutritional status was worse in those with poorer grip strength indicate as a greater proportion reporting unintentional weight loss(Ibid).

Kuh, D., *et.al.*, (2019) see how the factors associated with the decline in grip strength from midlife to old age. They carried out the

study among 3058 men and women and they found that adult height was strongly correlated with grip strength and remained constant with age and that men had stronger grip and a faster rate of decline than women (Beenakker, KG., *et al.*, 2010)

Wagner, PR., *et al.*, (2014) conducted a study on handgrip strength in elderly with upper limbs pain. They conducted the study on 119 elderly individuals, who were divided by gender 19 males and 100 females, with the mean age of females 68 years and males 67.58 years. The elderly were submitted for evaluation with a Kratos dynamometer. And after analyzing sample results, they observed that pain has affect handgrip strength being that male elderly people had stronger muscle strength as compared to females(Dodds, RM., *et al.*,2014)

CONCLUSION

The present study concludes that there is no correlation between the age the hand dominance and handgrip strength. Hand dominance does not change with the advancing age.

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Stressful life events and perceived stress among elderly people living separately from their adult children

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Varanasi, (Uttar Pradesh).

ABSTRACT

A community-based cross-sectional comparative study was conducted to identify the common psychosocial stresses and to compare the level of perceived stress between elderly people living separately from their adult children and elderly people living with their adult children or family members in the community. A total of 200 elderly people (100 elderly living with their adult children and 100 elderly living separately in the community) were randomly selected and were interviewed using a semi-structured interview schedule consisting of the socio-demographic profile, Presumptive Stressful Life Events Scale (PSLES), and Perceived Stress Scale (PSS). A significant difference ($p > 0.05$) was found in the PSS scores and PSLES scores of the elderly living alone. The elderly living separately from their adult children in the community were more prone to negative stressful life events and high perceived stress.

Keywords : Older Adults, Mental Health, Psychological Well-being, Stress, Living arrangement

Apart from the increase in the population of elderly people, several other changes have occurred during the last few decades that

affected the quality of life of elderly people. Modernization, urbanization, and migration of adult children have affected the living arrangement of elderly people in India. Especially migration of the youth has brought a major change in the life of elderly people. According to UNESCO, there about 31 percent of people have migrated from their living place for employment in other cities and states and around 35percent of them are youth (Rajan, 2013). Due to these factors, many elderly people are forced to live alone in their homes without any proper care and support (Chandrasekhar & Sharma, 2014). According to the National Family Health Survey, three fourth of the elderly people either live alone or with their spouse in India (IIPS, 2007).

Living alone or separately from adult children and family members in old age is very challenging due to the absence of proper care and support for elderly people. And It increases the risk of poor quality of life and several other psychological problems among them (WHO, 2004). Older adults need special attention, care, and emotional social support from their family members, especially from their children (Thapa, *et. al.*, 2018). Though living separately from children and family members in later life is already a stressful situation, several other psychosocial stressors occur in the life of elderly people. In such cases, elderly people who live separately may face more stressful situations and stress than others. Very few studies have been conducted in India to assess the stressful life events and level of perceived stress among elderly people living separately from their adult children. Hence the present study was conducted (1) to identify which type of stressful life events are generally being faced by the elderly people living separately from their children compared to elderly people living with their children and others in the study, (2) to assess and compare the level of perceived stress between elderly living separately and elderly living with their children and other in the community.

Method

For this community based cross-sectional comparative study a total of 200 elderly respondents (100 elderly living with their adult children and 100 elderly people living separately from their adult

children in the community), ages varying from 60 years and above, were randomly selected from some selected clusters in Varanasi (U.P.). Only willing persons were included in the study. Respondents having a hearing or visual impairment and chronic physical illness were excluded from the study.

Tool Used

1. Socio-demographic questionnaire: A semi-structured questionnaire consisting of socio-demographic variables (such as age, gender, marital status, educational status, occupation, residence, and living arrangement).

2. Kuppuswamy Socio-economic Status Questionnaire

3. Perceived Stress Scale (PSS) 10: PSS-10 was developed by Cohen, and Williamson, (1988). It is the most widely used psychological instrument to assess the level of perceived stress among individuals. It is 5 points Likert scale consisting of 10 items. Each item is rated from never (0) to very often (4). The total score is obtained by adding the score of each response (where 4 positive items 4, 5, 7 and 8's scores are reversed). An individual having a score of 0-13 indicates a low level of stress, a score of 14-27 indicates a moderate level of stress, and a score of 28-40 indicates a high level of perceived stress.

Presumptive Stressful Life Events Scale (PSLES): It was developed by Singh *et al.*, (1984). It is based on the Social Readjustment Rating Schedule (SRRS), developed by Holmes and Rahe (1967). It consists of 51 items related to different types of psychosocial stressors. It can be applied to both genders; male and female and age groups between 15-75 years. These items are divided into three subdomains such as desirable, undesirable, and ambiguous stressful life events. Respondents have to mark these items if any of these stressful life events had occurred in the last 1 year and their whole lifetime. A mean score has been given for each item. A total score of each domain can be calculated by adding all the items (marked stressful life events by the respondents). A high score obtained by the individual in the undesirable stressors indicates a high level of stress.

Each respondent was interviewed individually and that took approximately 30 minutes.

Statistical Analysis

The data collected from the respondents were coded and organized as per the objectives with the help of Micro-Soft Excel. And then it was exported in the SPSS version 20 (trial version) for the analysis. The qualitative data were analyzed by using the frequency, percentage, mean, and standard deviation (SD). The Study groups were matched by using the Chi-square test. The student's independent t-test was applied to assess the difference between the study groups.

FINDINGS

Table 1
Socio-demographic characteristics of the respondent in the study groups

Variables	Elderly living with their adult children (Group-1) N=100		Elderly living separately from their adult children (Group-2) N=100		Chi Square	df	P-value
	F	%	F	%			
Age (in years)							
60-69	76	76.0	73	73.0	0.237	1	0.626
70 years and above	24	24.0	27	27.0			
Gender							
Male	45	45.0	52	52.0	0.981	1	0.322
Female	55	55.0	48	48.0			
Marital Status							
Married	65	65.0	56	56.0	1.695	1	0.193
Single	35	35.0	44	44.0			
Educational Status							
Illiterate	28	28.0	19	19.0	2.253	1	0.133
Literate	72	72.0	81	81.0			
Occupation							
Working	42	42.0	34	34.0	1.358	1	0.244
Non-working	58	58.0	66	66.0			
Residence							
Rural	31	31.0	22	22.0	2.079	1	0.149
Urban	69	69.0	78	78.0			
Socio-Economic Status							
Lower	10	10.0	15	15.0	5.194	4	0.268
Lower Middle	13	13.0	13	13.0			
Upper Lower	35	35.0	28	28.0			
Upper Middle	27	27.0	36	36.0			
Upper	15	15.0	8	8.0			

Table 1 shows that both study groups were matched on each socio-demographic variable. The majority of the respondents (more

than 70%) in both study groups were aged between 60-and 69 years. The proportion of female respondents (55%) in group-1 and male respondents (52%) in group-2 was high. The majority of the respondents in both study groups were married, educated, and nonworking or financially dependent. Most of the respondents in both study groups were from urban areas. The proportions of the respondents belonging to upper lower and upper-middle-class of socioeconomic status in both study groups were found high.

Table 2

Stressful life Events faced by the respondents in the past 1 year in the study groups.

Presumptive Stressful Life Events		Elderly living with their adult children Group-1 (N=100)		Elderly living separately from their adult children Group-2 (N=100)	
Dimensions	Nature of Stressful Life Events	F	%	F	%
Desirable	Major purchase or construction of the house	13	13.0	4	4.0
	Change in the residence	8	8.0	9	9.0
	Gain of a new family member	19	19.0	10	10.0
	Going on pleasurable trips or pilgrims	26	26.0	17	17.0
Undesirable	Death of Spouse	4	4.0	2	2.0
	Death of a close family member	14	14.0	8	8.0
	Property or Crops damage	2	2.0	4	4.0
	Death of Friend	4	4.0	3	3.0
	Excessive alcohol or drug use by a family member	14	14.0	3	3.0
	Major personal illness or injury	11	11.0	4	4.0
	Financial loss or problems	62	62.0	74	74.0
	Illness of family member	30	30.0	31	31.0
	Self or family member unemployed	16	16.0	16	16.0
	Family conflict	45	45.0	48	48.0
	Death of pet	6	6.0	3	3.0
	Trouble with neighbors	24	24.0	21	21.0
	Unfulfilled commitments	6	6.0	43	43.0
	Change in sleeping habits	77	77.0	78	78.0
Ambiguous	Change in the working condition or transfer	9	9.0	10	10.0
	Reduction in number of family function	72	72.0	75	75.0
	Change in social activities	80	80.0	81	81.0
	Change in eating habits	74	74.0	72	72.0
	The wife begins or stops work	4	4.0	2	2.0

Table 2 describes the major stressful life events faced by the respondents during the past 1 year. There were several types of stressful life events commonly in both study groups. Common desirable major stressors were such as going on pleasurable trips or pilgrims, and the gain of a new family member in the family. The major undesirable stressors faced by the respondents were such as financial loss or problems, illness of family members, self or family member unemployed, family conflict, trouble with neighbours, unfulfilled commitments, and change in sleeping habits. The proportion of undesirable stressors faced by elderly people living separately from their adult children was found relatively higher than elderly living with their adult children in the community. The major ambiguous stressor faced by the respondents in both study groups were a change in several family functions, a change in social activities, and a change in eating habits. The proportions of these ambiguous stressors were found nearly equal in both study groups.

Table 3

Lifetime Stressful life Events faced by the respondents in the study groups.

Presumptive Stressful Life Events		Elderly living with their adult children Group-1 (N=100)		Elderly living separately from their adult children Group-2 (N=100)	
Dimensions	Nature of Stressful Life Events	F	%	F	%
Desirable	Marriage of daughter	35	35.0	31	31.0
	Major purchase or construction of a house	11	11.0	9	9.0
	Change in the residence	30	30.0	49	49.0
	Going on pleasurable trips or pilgrims	67	67.0	51	51.0
Undesirable	Death of Spouse	30	30.0	38	38.0
	Death of a close family member	28	28.0	30	30.0
	Property or Crops damage	7	7.0	3	3.0
	Death of Friend	8	8.0	3	3.0
	Excessive alcohol or drug use by a family member	15	15.0	7	7.0
	Major personal illness or injury	24	24.0	35	35.0
	Financial loss or problems	34	34.0	41	41.0
	Illness of family member	31	31.0	40	40.0
	Self or family member unemployed	17	17.0	11	11.0
	Family conflict	45	45.0	48	48.0
	Lack of son	2	2.0	8	8.0
	Large Loan	8	8.0	5	5.0

Ambiguous	Death of pet	15	15.0	11	11.0
	Unfulfilled commitments	14	14.0	18	18.0
	Change in sleeping habits	17	17.0	22	22.0
	Retirement	13	13.0	19	19.0
	Change in the working condition or transfer	10	10.0	14	14.0
	Reduction in number of family function	16	16.0	11	11.0
	Change in social activities	18	18.0	24	24.0
	Change in eating habits	10	10.0	25	25.0

Table 3 describes the lifetime stressful life events faced by the respondents in both study groups. The major lifetime desirable stressors faced by the respondents in both groups were a marriage of a daughter, change in the residence, going on pleasurable trips or pilgrimages. The proportions of these lifetime desirable stressors were found nearly equally in both study groups. The major lifetime stressors faced by the respondents in both study groups were such as the death of a spouse, death of close family members, major personal illness, financial loss or problems, illness of a family member, family conflict, self or family member unemployed, death of a pet, unfulfilled commitments, and change in sleeping habits. The proportions of some lifetime undesirable stressors such as the death of a spouse, major personal illness or injury, financial loss or problems, illness of a family member, family conflict, unfulfilled commitments, and change in sleeping habits were found to be comparative high among elderly people living separately from their adult children than elderly people living with their adult children in the community.

Table 4

Level of Perceived Stress among the respondent in the study groups

Variables	Level of Perceived Stress			Chi Squire	df	P-value
	Low	Moderate	High			
	F (%)	F (%)	F (%)			
Study Groups						
Group-1	27 (27.0)	60 (60.0)	13 (13.0)	8.318	1	0.016
Group-2	11 (11.0)	73 (73.0)	16 (16.0)			

Significant Difference at 0.05

Table 4 describes the distribution of the level of perceived stress among the respondents in both study groups. The majority of the

respondents in both study groups were found with a moderate level of perceived stress. But there was a significant difference ($p < 0.05$) found in the level of perceived stress in both study groups.

Table 5
Comparison of Level of Stress and Stressful life Events between the study groups.

Variables	Study Groups	Mean	SD	t value	P-value
Perceived Stress Scale's Score	Group-1 Group-2	18.32 20.94	6.67 5.06	3.132	0.002
Mean of Score of the total PSLES (Past 1 year)	Group-1 Group-2	241.00 282.51	111.04 87.81	2.932	0.004
Mean Score of Desirable PLSES (Past 1 year)	Group-1 Group-2	18.60 23.16	25.29 34.36	1.069	0.286
Mean Score of Undesirable PLSES (Past 1 year)	Group-1 Group-2	151.94 184.39	98.40 71.29	2.670	0.008
Mean Score of Ambiguous PLSES (Past 1 year)	Group-1 Group-2	89.80 97.17	45.69 35.94	1.268	0.206
Mean Score of the total Lifetime PSLES	Group-1 Group-2	250.87 310.08	133.35 135.50	3.114	0.002
Mean Score of Desirable Lifetime PLSES	Group-1 Group-2	47.84 57.29	49.09 45.30	1.415	0.159
Mean Score of Undesirable Lifetime PLSES	Group-1 Group-2	172.78 204.01	105.24 106.39	2.087	0.038
Mean Score of Ambiguous Lifetime PLSES	Group-1 Group-2	30.25 48.88	38.11 41.46	3.309	0.001

Significant Difference at 0.05

Table 5 describes the mean score of the Perceived Stress Scale (PSS) and Presumptive Stressful Life Events Scale (PSLES). On applying the independent t-test, a significant difference was found ($p < 0.05$) between the mean score of PSS in both study groups. The level of perceived stress was found comparatively high among elderly living separately from their adult children. While comparing the PLSES (Past 1 year) score between both study groups, a significant difference ($p < 0.05$) was found in the mean of total PSLES score and Undesirable PSLES score between both study groups. There was also a significant difference found ($p < 0.05$) in the total lifetime PSLES score, lifetime Undesirable PSLES score, and lifetime Ambiguous PSLES score between both study groups. These findings indicate that elderly living separately

from their adult children were found with more stressful life events, especially undesirable and ambiguous stressors than elderly people living with their adult children in the community.

DISCUSSION

The present study was conducted to identify the common stressful life events faced by the elderly people living separately from their children and elderly living with their children and others, and to assess and compare the level of perceived stress between the elderly people living separately and elderly people living with their children and other in the community. In the present study, the result was found that the proportion of the desired presumptive stressful life events in the past one year was found comparatively high among the elderly living with their children compared to the elderly living separately. The proportions of the undesirable (especially; financial problems, illness of family member, self or family members unemployed, and change in eating habits) presumptive stressful life events faced by the elderly people living separately from their children in the past one year were found comparatively higher than elderly people. But the proportion of the ambiguous presumptive stressful life events in the past year was found nearly equal in both study groups. Similarly, the result of the present study also indicates that the proportion of desirable lifetime presumptive stressful life events was found comparatively high among the elderly living with their children than the elderly living separately. But nearly half of the elderly living separately in the community had faced a change in the residence as a desirable lifetime stressful life event. The proportions of undesirable and ambiguous lifetime stressful life events were found comparatively high among elderly people living separately than elderly living with their children and others in the community. The most common lifetime stressful life events faced elderly people in both study groups were as follows; desirable events (marriage of a daughter, change in the residence, going on a pleasurable trip), undesirable events (death of spouse, death of close family member, major personal illness or injury, financial loss or problems, illness of family member, family conflict), and ambiguous events (retirement, change in social activities, change in eating habits).

Similarly, some previous studies had reported that several types of adverse life events such as retirement, financial difficulties, major

personal physical illness or accidents, illness of close family members, marital difficulties, family conflict, death of a spouse, death of close family members or friends, the marriage of an adult child, and son or daughter leaving home, etc. generally occur during the age of 65-70 years. Due to these adverse events the individual has to face a high level of stress and which affects their psychological well being also increases the risk of health-related issues such as depression (Kraaij, *et al.*, 2002, Ong and Othman 2007, Seematter-Bagnoud, *et al.*, 2010,).

In the assessment of the level of perceived stress among the respondents in both study groups, the result was found that the majority of respondents had to undergo a moderate level of perceived stress but the level of perceived stress was found significantly ($p < 0.05$) higher among elderly living separately from their children as compared to elderly people living with their children and others in the community. The present study also found that there was a significant difference ($p < 0.05$) in the score of the perceived stress scale (PSS) between both study groups. These findings are similar to the findings of some previous studies conducted in India and others (Mui. 1999, Kim 2009, Toor,*et al.*, 2014, Tondan 2017, Dar, *et al.*, 2019, Seangpraw, *et al.*, 2019).

The result also indicates that there was a significant difference ($p < 0.05$) in the mean of the total score of presumptive stressful life events scale (PSLES) in the (past one year) respectively the mean score undesirable PSLES, the mean of a score of the total lifetime PSLES, the mean score undesirable lifetime PSLES and the mean score of ambiguous lifetime PSLES between both study groups. The perceived stress and presumptive life events have been found comparatively high among elderly living separately from their children as compared to elderly people living with their children in the community. A study conducted by Davis, *et al.*, (1992) reported that the living arrangement of elderly people plays an important role in their survival. Living alone in later life might be more stressful for elderly people, especially for men. Mui (1999) had reported that the elderly who live alone in the community experience more stressful life events and they were more prone to be depressed.

CONCLUSION

Support from family members in old age is very important for elderly people. They need proper care and support from their adult

children and other family members. Many elderly people live separately in the community due to the migration of their adult children. Living alone without any proper care and support, they have to face several types of stressful conditions. The findings of the present study revealed that the elderly living separately from their adult children faces several types of negative stressors in the absence of support and care from their adult children. The negative stressful life events or undesired stressors were found significantly more prevalent among the elderly people living separately from their adult children than the elderly living with their adult children and other family members in the community. The living condition of elderly people plays an important role in the quality of their mental health. There was a significant difference found in the level of perceived stress between elderly people living separately from their adult children and elderly living with their adult children or other family members in the community.

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Social Isolation among Elderly- Deterministic Interaction

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ABSTRACT

Social isolation can be defined as an absence of interaction, contact, and relationship with family and friends of a person on an individual level, with neighbours on a broader scale, and with society on a large scale. This study sought to explore the impact of social isolation among the elderly at different levels. A total respondent of 100 elderly was selected by using a multistage random sampling technique from various locations of Lucknow city (U.P), divided into three age groups 65-70 years, 70-75 years, and above 75 years. Information was collected using a demographic profile sheet and a Loneliness scale UCLA developed by (Russell, et al., 1978). Results of the study revealed that loneliness was found to have a deterministic relationship with gender where male respondents exhibited more loneliness in comparison to female elderly.

Keywords: Social isolation, Loneliness, Elderly, Social networks, Mental health

Social isolation, defined as the lack of quality and quantity of interactions with other individuals, including group and community interactions, is a multi-dimensional construct (Clair, *et al.*, 2021). Low diversity and frequency of social contact are risk factors for social isolation, which may lead to memory dysfunction (Fratiglioni, *et al.*, 2000). Social isolation is also thought to be a potential consequence of poor memory (Thomas, *et al.*, 2011).

Several detrimental health effects are associated with social isolation, including higher morbidity and mortality (Courtin, & Knapp, 2017). Older adults are at significant health risk due to social isolation and loneliness, yet these risks are often underestimated. Family caregivers may be particularly vulnerable to social isolation in COVID-19 since they are already vulnerable to stress, anxiety, and depression (Bei wu, 2020). Social distancing could lead to a decrease in social interaction, which may negatively affect mental and physical health among the elderly (Loyola, *et al.*, 2020). Physical symptoms of loneliness in seniors that result in raised blood pressure include feelings of being unneeded, unwanted, unloved, devalued, neglected, betrayed, abandoned, not good enough, mistrusted, exploited, and psychologically abused (Singh, and Kiran, 2013). Being alone or living alone are two different things, feelings of loneliness may occur to a person even if surrounded by others. Conversely, an individual who lives alone does not feel lonely (Bandari, *et al.*, 2019). Loneliness can lead to depression in the elderly, which is significantly associated with social isolation (Kasar, and Karaman, 2021). Loneliness causes anxiety, fear, and depression. It decreases self-confidence and the fear of being abused increases and ostracism from society by increasing the tendency of negative thinking (Grover, *et al.*, 2022). Loneliness can lead to reduced happiness and reduced satisfaction with life, as well as depression, which may lead to physical health problems (Patel, and Ginsberg, 2020). The study aimed to determine the direction of the objective pathways based on the impact of social isolation associated with the R-UCLA loneliness scale.

Materials and Methods

The study was conducted based on an ex-post facto research design. The purposive random sampling technique was used to select the respondents from various locations in Lucknow city. Respondents were selected excluding severely sick, disabled or having neurological problems, mentally retarded, and with any primary sensory deficit. The selected respondents were in the age group of 65-80 years, categorized into three age groups 65-70 years, 70-75, and above 75 years. To achieve the objectives stated above, the following tools were used.

Tools & Techniques

Socio-Demographic Profile Sheet – The socio-demographic data was collected using a self-made socio-demographic profile sheet, which included information about age, gender, marital status, education, occupation, income, family domicile, place, and duration of stay.

Ucla Loneliness Scale – The revised loneliness scale (UCLA) was developed by Russell, *et al.*, in 1978. This scale was used to assess social isolation & loneliness. UCLA scale scores highly on various tests of validity, including internal consistency. Numerous studies and surveys on loneliness use the scale. In each location, respondents' information was collected using a pretested schedule. The collected data were coded, tabulated, and statistically analysed with the help of SPSS version 20.0 software. Then it was analysed using the Chi-Square test.

Results and Discussion

Table no.1 shows the demographic profile of the respondents. It is evident from the data that the significant proportions (42.0%) of the elderly were in the age group of 65-70 years, followed by 70-75 years (36.0%), while only 22.0 per cent of the respondents belong to 75 years and above age group. Another essential demographic characteristic is gender. It is evident from the data that a significant proportion of the sample was found to be male (58.0%), while only 42.0 per cent of the respondents

were female. It can also be derived from table no. 1 that the majority of respondents (60.0%) were married, followed by widowers (22.0%), and only 18.0per cent of them were widows. Most of the respondents (58.0%) belong to a nuclear family, and 42.0per cent are from joint families.

Table 1*Demographic Profile of the respondents*

Items		Frequency (N=100)	Percentage (%)
Age(in years) of the respondents			
1	65-70	42	42.0
2	70-75	36	36.0
3	75 and above	22	22.0
Total		100	100.0
Gender of the respondents			
1	Male	58	58
2	Female	42	42
Total		100	100.0
Marital status of the respondents			
1	Married	60	60.0
2	Widow	18	18.0
3	Widower	22	22.0
Total		100	100.0
Type of family of the respondents			
1	Joint Family	42	42.0
2	Nuclear Family	58	58.0
Total		100	100.0

Table 2

Assessment of the social isolation among the elderly across gender of the respondent

S.N	Gender of the respondents	Level of loneliness			
		Less lonely	Moderate lonely	Extreme lonely	Total
1.	Male	30 (51.72)	24(41.37)	4(6.89)	58.0
2.	Female	28(66.66)	14(33.33)	0	42.0
3.	Total	58	38	4	100.0

Chi-Square (X^2) 4.249^aNS, (Figures and parenthesis indicates percentage)

Based on the findings (Table 2), both males and females experience loneliness. The male respondents, who accounted for 6.89 percent of the total, experienced intense loneliness across all genders. In comparison to female respondents, male respondents (41.37 percent) reported the higher level of moderate loneliness (33.33 percent). Female respondents were likewise found to have a low feeling of loneliness (66.66 percent). As a result, a clear and overall conclusion of the intensity of loneliness level among elderly respondents was that male respondents would have the highest level of loneliness compared to female respondents.

Table 3

Assessment of the social isolation among the elderly across the age of the respondent

S.N	Age of the respondents	Level of loneliness			
		Less lonely	Moderate lonely	Extreme lonely	Total
1.	65-70 years	26(61.90)	14(33.33)	2(4.76)	42.0
2.	70-75 years	20(55.55)	16(44.44)	0	36
3.	75 and above	12(54.54)	8(36.36)	2(9.09)	22
4.	Total	58	38	4	100

Chi-Square (X^2) 3.769^a NS, (Figures and parenthesis indicates percentage)

Table 3 depicts the level of loneliness among people of different ages. It can be seen that as people get older, their feelings of loneliness rise. Loneliness during social isolation is lower in the 65-70 age group than in the 70-75 age group and it is higher in the 75-plus age group. It was also shown that, across all the age groups, a majority (9.09%) of those who experienced intense loneliness were above 75 years old, as opposed to 65-70 years and 70-75 years old. In comparison to other age groups, the respondents who felt less lonely (61.90%) were between the ages of 65 and 70. In comparison to the 65-70 and 75 and above age groups, Moderate loneliness was discovered in 44.44 per cent of the elderly in the age group of 70-75 years.

Table 4

Assessment of the social isolation among the elderly across a type of family of the respondent

S.N	Family type	Level of loneliness			
		Less lonely	Moderate lonely	Extreme lonely	Total
1.	Nuclear Family	38 (65.51)	20 (34.48)	0	58.0
2.	Joint Family	20 (47.61)	18 (42.85)	4 (9.52)	42.0
3.	Total	58	38	4	100.0

Chi-Square (X^2) 7.319^a NS, (Figures and parenthesis indicates percentage)

The level of loneliness differs in both nuclear and joint families, according to the findings (Table 4). Loneliness increased in the joint family, and it is obvious that respondents in nuclear families feel less lonely than those in joint families. It can also be observed that across all the family types extreme loneliness is expressed by 9.52 per cent among elderly belonging to joint family respondents group whereas the nuclear family respondents feel less lonely (65.51%) than joint family. A moderate level of loneliness was expressed by the majority belonging to joint family (42.85%) as compared to nuclear family respondents (34.48%).

Table 5

Assessment of the social isolation among the elderly across the marital status of the respondent

S.N	Marital status of the respondents	Level of loneliness			
		Less lonely	Moderate lonely	Extreme lonely	Total
1.	Married	32 (53.33)	28 (46.66)	0	60.0
2.	Widow	14(77.77)	4 (22.22)	0	18.0
3.	Widower	12 (54.54)	6 (27.27)	4 (18.18)	22.0
4.	Total	58	38	4	100.0

Chi-Square (X^2) 18.698^a NS, (Figures and parenthesis indicates percentage)

The level of loneliness is also associated with marital status, as seen in Table 5. Only widower respondents (18.18 %) reported extreme loneliness. It can also be observed from the data that the majority of the respondents who were married (53.33%) were found to be less lonely whereas the highest level of loneliness, was expressed by widowers (27.27 %) and widows (22.22%). Social isolation may be the major contributing factor to loneliness, especially among the elderly.

Discussion

The subjective experience of social isolation among the elderly was investigated in this study. Our findings indicate that male elderly suffer from more loneliness to mitigate the effect of social isolation. Memory decreases when social isolation increases mean that social isolation is inversely proportional to memory. According to our results, social isolation has a more profound effect on memory than vice versa. Additionally, previous findings indicate that social isolation and loneliness are global problems among older adults.(Wu, 2020). We were able to test competing pathways between memory changes and social isolation in contrast to previous studies. Another study found age-related social isolation and memory decline are highly correlated. This study found that the level of social isolation was associated with a somewhat greater decline in memory in men (Read, Herrera & Grundy 2019). A significant decrease in memory was observed by a massive increase in social isolation among men. In the

study the effect was similar in men and women, results suggest a stronger correlation between social isolation and memory change in men than in women. Social isolation results in enormous changes and predict more extensive changes later on, including a tendency towards recovery when the level of isolation reaches a higher level; that is, those who are isolated tend to become less isolated rather than become more isolated. Men experiencing increased isolation also exhibited signs of loneliness. The findings during the time of the pandemic, social isolation harms well-being and life satisfaction is in line with the finding of Clair, *et.al.*, (2021) that increased loneliness and psychological well-being suffers and resulted in significant negative consequences due to social isolation. The sustained process of recuperation to reduce isolation seems to alter the pattern of memory changes despite the fact that increased isolation was associated with loneliness among male respondents. Women's social isolation scores remained stable over time, and the number of women with high isolation scores was smaller than men's.

In addition, differences between genders reflect a specific time window of change: changes in social isolation or rebalancing of losses to society may occur more rapidly in men. Among women, for instance, more connections helped reduce loneliness. Additionally, gender may play a role in compensating for losses among the elderly by forming social connections or increased contact with friends or family after a loss.

Conclusion

In conclusion, this study suggests that perceived social isolation has a bearing on health-related quality of life during isolation. Poor life satisfaction is associated with social isolation regardless of gender, age, family type, or marital status. Loneliness can be exacerbated by social isolation. Anxiety and depression were the most common mental and physical outcomes reported.

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Perceptions of Ageing among Middle Adults and Elderly and its Implications on Subjective Wellbeing

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ABSTRACT

This study aimed to identify the concepts and perceptions of ageing in middle-adults, (N=30), ages varying from 40 to 50 years, and elderly (N=30), of 60 years and above. It was also aimed to find out how the participants' perceptions and attitudes influence their life satisfaction. The participants (N=60) equally representing men and women, who belonged to the lower socioeconomic status, were interviewed individually. Rowe Kahn Scale (1998) was adapted to measure the influence of ideas of ageing on their satisfaction. Participants viewed ageing related to disabilities and dependency as well as a decline in physical capacities as a natural process. Overall, 90 per cent of the elderly reported being satisfied (Santusht) with their lives. Cultural values like intergenerational reciprocity and the idea of serving (Seva) were guiding principles for many middle adults.

Keywords: Ageing, Satisfaction, Cultural practices, Coping mechanism, Positive ageing, Resource-poor context, Acceptance

Middle age is the transitional period of an individual's life. Generally, it is seen that in the phase of early middle adulthood, the

goals an individual strives for are career fulfillment, education of children, and being financially independent, true for men and many women. Changing patterns in families may reflect their influence on middle adults' parents (Pierson, C., and Castles, FG.,2006).

Successful Aging and the Parameters of Happiness

Productive aging stems from a theoretical understanding of late-life that incorporates its potential as a time of contribution, adaptation, and success, yielding a comprehensive knowledge of the aging process and the older adult population. There are overlapping terms with successful aging, such as productive aging and civic engagement in later life; there were models that introduced how aging can be a positive experience, such as Rowe, & Kahn's (2000) Model of Successful Aging, which highlighted how social life and good health (avoiding disease) could lead to positive ageing. Ideas of not withdrawing self from the society but engaging in the community were supported in emerging theories (Johnson & Mutchle, 2014).

The term productivity is an economic term used in gerontology. Many scholars criticize the term by arguing that those who are not contributing to the economy are 'Unproductive.' The productive dimension seems to be stereotyping aging (Tze Pin., *et al.*, 2018). It ignores spirituality, which is part of aging in many Asian countries such as India, China, Japan, and Nepal. Hindu philosophy talks about the last stage of *Sanyasa* or renunciation, the period of old age when an individual is prescribed to leave(economically) productive things in nature and becomes spiritually inclined.

Theoretical Frameworks

1. Gerotranscendence (Lars, 2005) advocates that there is a shift in an individual's perspectives as an individual's consciousness becomes more detached and cosmic, and one strives for wisdom. There is a shift mainly in three major dimensions:

1. The cosmic self starts experiencing unity with the universe.
2. The self, redefinition of self, conduces to become less self-centered, and the interest in material aspect of life declines.
3. Social relationships, and social engagement decline; one spends more time in spiritual activities such as meditation.

The current study strives to get an insight into the transition in conceptual understanding of ageing and the elderly in the contemporary world, as well as influential factors of globalization, namely the education system, employment opportunities, technology, and lifestyle changes, and how these changing ideas affect the conceptualization of subjective satisfaction in elderly.

Ageing is unique in different cultures, and as the world is a global village cultures are becoming more homogenized, leading to a decrease in diversity. However, western philosophical and cultural ideas led to influence the macro-systems such as educational, political, and economic structures and the microsystems, namely the values and morals people hold in life. These changes include family dynamics, inter-generational conflicts, difficulties with in-laws, and gradual loss and changing roles of the elderly in families; mental health issues are also increasing among individuals (Carson, *et al.*, 2009). Thus, the present study plays a role in identifying the thought processes of people today regarding aging and their influences on the elderly. Furthermore, the study focuses on the implication of changing ideas on the conceptualization of subjective satisfaction.

This is a qualitative study with the following objectives:

- To unravel the beliefs and attitudes regarding ageing and the elderly.
- To understand the relationship between ideas of ageing and life satisfaction.
- To understand factors influencing the ideas of ageing.
- To know the beliefs and attitudes towards ageing and the elderly and to see their influence on subjective satisfaction.

Method

Sample

The study was conducted with the elderly (60 years and above) of Vadodara, a mid-sized city in western India in the state of Gujarat. The participants belonged to lower socioeconomic status. They were reached using the purposive snowballing technique. The study's sample size was N=60, further divided into the two socioeconomic classes and gender. Middle adults (N=30); Middle-Aged Male (N=15)

and Middle-Aged Female (N=15). Elderly (N=30); Elderly Male (N=15) and Elderly Female (N=15). Middle Adults included individuals between 40 to 50 and the elderly included persons above 60 years of age. The participants were contacted through purposive snowball sampling. Participants were approached in parks, religious functions, and grocery stores. In the interview process, the participants were brief about the research and the study.

Tools Used

Kuppuswamy scale (Salim, 2019) was used. to measure the participant's socioeconomic status.

The **interview schedule** was made by the investigators and it consisted of questions related to ideas of ageing, perception towards the elderly, the influence of media, changing roles and responsibilities, other factors affecting ideas of ageing, ideas about successful ageing (cultural differences), and anxiety regarding ageing. The interview schedule was translated into the local languages.

Rowe Kahn scale for successful aging (1998) to see the influence of ideas of aging on satisfaction, the scale was adopted.?

Data analysis

The data was first transcribed for qualitative data analysis; the data was coded and merged to form broad themes and patterns.

Results and Discussion

Perceptions about ageing, (*Vridhavastha*) the idea of ageing, is divided into three significant categories reflected in ageing as a psychological concept, physical decline, and natural process; the answers that are different from these three categories are reported separately. Around 35 (58%) of the respondents believed old age is physical decline or dependency; the majority are elderly women (9 respondents) and middle adults (26 respondents); All the responses showed that if individuals are active enough to perform all tasks independently, they should not be considered old. Illness and diseases were reported to be a sign of being a burden on the family. Eighty percent of participants reported aging as a natural process. They expressed it as the law of nature; that cannot be hindered. Respondents said that aging signs or inabilities that come with aging need to be accepted. Old age must be enjoyed as other life stages and

should not be complained about. A prominent view commonly reported was 'aging is natural and beyond human control, and therefore should be accepted.

The participants reported a cultural transition by 60% (33.3% middle adults, 26.3% elderly). They mentioned that people now have less respect for elderly in families. In addition, most middle adults (33%) responded that the elderly face issues in the contemporary era, specific security in society, neglect, and financial matters.

Responsibilities in old age and gender

Elderly men talked about increasing responsibilities in old age, where they highlighted that today, younger members of the family, including daughters-in-law, are employed; as a consequence, it has caused uneven distribution of household chores. Elderly women are mostly responsible for these tasks; however, elderly men also shared their contribution in helping their wives. Approximately 46 per cent of them reported that these tasks help them to be busy and have an active life, and 30 per cent reported feeling pressured and sometimes used by family members.

In the voice of an elderly man, "*We are supposed to work as nannies... We are asked to take kids out in the garden... As you can see here only grandparents are with kids. We are supposed to do household chores. That's all we do*".

The majority of elderly men (11 respondents) reported that they help their wives with household chores or taking care of grandchildren. Four out of 15 older men said they fear losing their partner and now care more about their partner. Three of them reported that they feel more sensitive towards their wives. It was reported that elderly participants feel less attached to their families; this detachment depends on the kind of experiences the elderly face in families; these experiences can be adversely affecting and positive. However, according to responses, few significant types of behaviours were noted.

Detachment styles Vairagya vs. Resentment

It was observed that if the elderly in families are less supported in terms of physical, emotional, and financial help or there is some sense of disappointment from family as a consequence, it causes two

types of observable attitudes.

One, where detachment from family is high, the dependency is low, and the elderly tend to explore religious activities and rituals (respondents 6).

An elderly man explained his view on neglect he faces from family and how to cope with his situations he expressed, *"Do not let the aging overpower you go to Satsangs and meet people. Keep yourself busy, do not stay alone, we do that if only we go out and meet people we are not dependent on anybody"*.

The second type of attitude observed was where high detachment becomes the reason for resentment, and the elderly develop a sense of being used, and they also reported to have a negative outlook on a new generation and most of the time complaining attitude towards life (3 respondents). As expressed by an elderly woman, *"There is a substantial difference in today's generation, the previous generation, and the future generation. The way in contemporary era sons and daughters in law treat elderly is very much evident to you...for future, I have no words"*.

Elderly respondents who reported having enough supporting and caring environments in the family; were noted to be under the third category of behavior with low detachment, clinging and demanding nature, and more contentment than others. They are exploring and taking part in extra leisure activities (8).

Lastly, the highest numbers of the participants were noted under the category, where it was observed that these participants had wiser perspectives towards life, and they gave space to family members, less complaining, and allowed the younger members of the family to make their decisions and positive outlook towards today's generation (10).

The idea of non-attachment is called *Vairagya*; it is the desired virtue to be followed in old age in Hinduism. It is of two types, one where the individual is ready to let go of worldly desires with contentment and follows the spiritual path of life. Second, the individual follows not *Vairagya* but resentment. Resentment is the path of pain and expectations where one hopes to get back to the attachments of family or the world; when the elderly face adverse incidents, it leads to disappointment. Non-attachment is the path of love and care beyond

the ties of kin. It is the foundation laid on a humanitarian perspective, and to follow the path of non-attachment remains the choice of the individual and his/her intellect, what they choose as a goal it can be either still being with kin or going beyond the boundaries of limited relationships and exploring inner self or spiritually.

Life Satisfaction and Acceptance

The concept of satisfaction (*Santosh*) is divided into four categories that were majorly seen in the participants' responses. Family goals and satisfaction, financial security, being content or happy in whatever you have, and religious activities. Furthermore, there were no clear-cut boundaries in all the ideas of satisfaction; hence, they overlapped in some cases. For example, eighty percent of the participants reported their idea of satisfaction in meeting family goals and expectations, but 60% of the participants directly mentioned that their family's happiness and peace decide their *Santosh* in life. Also, elderly participants reported that if their children do *Seva* (care and respect) to them, and live together in the family, then they are satisfied.

However, 33 per cent of the participants, mostly middle-aged women, highlighted that this idea of expectation from future generations needs to be changed. They reported that when we are not able to serve our parents, how can we expect our kids to serve us. The idea of acceptance was reported under three categories: aging signs (wrinkles, whitening of hair and losing teeth, and such), physical decline (diseases and other inabilities), dependency caused due to the declines, and family conflicts. Moreover, the idea of death has emerged as a construct of an individual's ideology towards aging and physical decline; it was found that participants consider ageing as natural and death as a reality of ageing.

Acceptances in terms of signs of aging were reported by 75 per cent of the participants; however, two of the participants reported that if dyeing hair makes one happy, one must do it.

In Indian culture transition of roles in the family and expectations that come with different responsibilities throughout the lifespan prepare the individual for the changes, for instance in middle age preparation for children's marriage and the desire to be grandparents in later life prepares

for old age, and inculcates the sense of acceptance in individuals. Some virtues and ideologies provide foresight to be wiser in all stages with righteousness, particularly *Ashram Dharma's* philosophy.

Acceptance in terms of death was not majorly and directly discussed; it was only reported by 13 per cent of participants. However, mostly the elderly discussed how they have been left with a limited time span (*Samay*), and it changes the way they perceive money, relationships, and other aspects of life, which makes them wiser. These respondents mentioned the importance of not saving money on some occasions and spending it with family; these elderly respondents also highlighted the idea of reducing gender stereotypes in the family and the importance of spending quality time with family.

An elderly woman expressed her feeling about the death of her husband and how religious scriptures and gurus helped her to cope in her life she said, "*When my husband died it affected me a lot. Then I read Geeta (religious scripture) and it helped me feel peaceful as it was written that as a physical body changes clothes similarly soul changes the body after death hence, we must grief behind people who die instead we must pray good for their next life*".

Ageing acceptance and fear

Ayurveda (Indian ancient medicine science) talks about old age as a period between 71-100, and it does not propagate the concept of immortality. Instead, it advocates the importance of health and well-being in old age to fulfill spiritual goals and inner wellbeing. However, it never supports the concept of reversing aging. Instead, it talks about the longevity and health that revolve around the idea of *Moksha* (liberation) which can also be referred to as spiritual immortality (Devi, *et al.*, 2010). The idea of reversing aging and remaining young is still a western concept for Indian elderly and middle adults, especially in lower socioeconomic classes; however, dependency is a major fear behind old age that comes with physical decline and diseases. An active lifestyle in old age is a more appreciable and desired outcome for both middle adults and the elderly.

Kushal Kushal Jo Puchhta, Jag Me Raha Na Koye

Jara Maui Na Bhay Mua, Kushal Kahan Te Hoye. (Kabir Dohawali, 2013)

Sadguru Kabir explains that people repeatedly ask about others' well-being when nobody is immortal in this world, and if one is not free from aging and its fear, how can wellbeing be possible.

Changes in family and elderly

Significantly noticeable changes in families were observed from the responses: changes in earning patterns and improvement in the position of the younger women in patriarchal families, especially in terms of education and employment which have led to a better understanding of rights and gender sensitivity. Because now young women members and men earn equally for the family, the under-involvement of in-laws and husbands in household chores leads to conflict and disagreements in families (Carson, *et al.*, 2009).

The influence of these changes was reported as a feeling of being used in elderly men; however, it must not be ignored that Indian culture supports the idea of *Seva* (serving care and respect) to elderly parents who mostly come under the role of daughters-in-law. In contrast, an ideal son must support elderly parents financially and consider their opinions in the family.

It can be predicted that elderly women will face more challenges in families related to the increased burden of household work, financial dependency, and neglect by family members. These changes need to be considered as reported by the UNFPA (2012), that there will be more elderly women as compared to elderly men. The demands and needs of women will be different in Indian families as they are more dependent on their living; this report also highlights the importance of working on enhancing traditional Asian systems of family support and encouraging the elderly for personal savings.

Gender in later life

Lucea (2017) argues that men hold masculine traits only until they are young and youthful; as men lose power, they gradually give up masculinity. Although the findings of this study indicate that gender differences tend to neutralize to an extent as one ages, it highlights that elderly men tend to feel sensitive towards their wives; they care more and fear losing their spouses.

In a patriarchal culture, women are expected to be more serving to their families. They tend to build a better relationship with their family members in old age, it allows her to be more interconnected to

their kin; also, the cultural attributes of being caring and loving do help her in navigating the social relationships that eventually prevent her from being lonely or alone. In our societies, household chores are devalued however, considering the context of Indian families it was reported that when men are in their old age and retired mostly in position same as their wife tend to empathize with her more, and it leads to the realization of her sacrifices in patriarchal setup.

Havigurst, and Albrecht(1953), talk about that in old age, when income is low, and the elderly tend to lose their physical activeness expected, “adopting and flexibly adapting social roles” is also a task of late life. Of course, performing these roles needs to depend on one’s choice, but the fact that most Indian elderly are poor or financially weak leads to the compulsion for them to steer and readjust their place in the family.

Ashrama Dharma living realities in Indian culture

Ashrama Dharma theory talks about the third *Vanaprastha ashram* (50 years-75 years), which is about gradual withdrawal from family, and advocates that an individual must use his wisdom for the betterment of society. *Vanaprastha ashram* benignly affects an individual’s retirement period and his overall wellbeing. It prepares a foundation in the psychology of individuals so that later vacuum created from withdrawals and retirements can be avoided.

The fourth stage is called *Sanyas Ashram*. It is the ideal stage, at this time, the individual is supposed to withdraw from the world completely he is supposed to be one with Humanity and seek liberation. He must serve the needy, he must commiserate with those who mourn, must find his joy in others’ joy, and should not get aggressive (Tiwari & Pandey, 2013). These old ideas are highlighted in contemporary research on gerontology. For instance, Lars Tornstam (2005) highlights the elderly to be a redefinition of self and relationships with other Individuals and new insight into world existential realities. It advocates individuals to become less occupied with self and particular in selecting the societal and other different activities.

Theory advocates increased affinity for past generations and decreased interest in relationships decreases. Individuals also experience an inclination for solitary meditation. The theory of

gerotranscendence questions the projection of popular theories and research on aging; it highlights the ideology of 'success' as the goal of midlife in western culture and hopes to continue in old age. This theory argues successful aging is rooted in western philosophies, white, middle-aged, and middle-class people who are successful in their life. These models emphasizes on being active and productive that have led ordinary people and scholars to project their ideas with a limited paradigm (Lars, T., 2005), whereas, the findings of this study advocate the significance of the approach in dealing with conflicts within the family, acceptance in life and ageing.

Acceptance and satisfaction

This study supports the idea of acceptance in terms of physical decline and diseases in family-related conflicts, which directly influence people's satisfaction. The Hindu religious and philosophical memes support the idea of acceptance in Indian culture. These memes are guided by *Dharma* (righteousness) in different life stages and followed to perform the right action towards self, family, and society these actions direct one towards the ultimate goal of life which is *Moksha* (liberation). All the stages of *Ashrama Dharma* theory also follow the same principle.

The second stage of *Ashrama Dharma* theory advocates that a *Grihastha* (householder) is required to fulfill all responsibilities towards his family, including elderly parents, by serving them with love and respect (Tiwari & Pandey, 2013).

Satisfaction (*Santosh*) and detachment

In this study, satisfaction is defined as a psychological phenomenon indicating the subjective evaluation of one's life situations. India is a country where kin play a vital role both middle adults and the elderly define their satisfaction in relating to their family goals and relationship, and the idea of serving family members is a cultural construct in Indian tradition. It was seen that elderly participants with negative family experiences tend to complain more and have a negative perspective toward the younger generation. In contrast, the elderly with positive experiences and support in families reported having a more positive outlook on life and being more satisfied.

Krause (2003), reveals that religious activities promote better

life satisfaction, self-esteem, and optimism in old age, adding to overall subjective wellbeing. Similarly, this study also reports that religious activities play a vital role as it guides the individuals in adverse situations to maintain peace and accept a physical decline, sense of loss, and conflicts in family rituals namely *Satsangs*, *Kirtans* help one to be social in dealing with adverse situations that are out of human control. It is ironic that the majority theory of successful aging limits spirituality in their domains.

Resentment vs. renunciation (*Vairagya*)

Enright (2015), highlights the difference between resentment defined by psychology and philosophy; he explains that philosophers believe resentment is a sign of respect towards self and a person of a moral character, who knows right from wrong towards self. In contrast, psychologists believe resentment over a long period can cause an unhealthy response to injustice, which can lead to inner anger, anxiety, and depression.

This study highlights two detachment behaviors in old age that support this philosophical idea. One of the behaviors was where individuals expressed feeling of detachment from family responsibilities, increased involvement in religious activities, and reported an accepting and positive outlook towards life changes. In contrast to the first, the other behavior observed was individuals reported to be detached from family and having no expectations from kin because of adverse family experiences. This causes resentment in life, which is neither ideal for spiritual growth nor mental health, as resentment gives birth to anger and grudges, not compassion towards the world.

Conclusion

The study seeks to represent the traditional constructs guiding the approach towards the elderly and the influence of modernization on these constructs. The study also highlights the importance of family ties and relationships in an individual's wellbeing; it focuses on the guiding principles or cultural memes that set the idea of satisfaction.

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Prevalence of depression and its association with nutritional status among free-living older adults of Burdwan, (West Bengal)

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ABSTRACT

There is a notable increase in the number of older adults and the emergence of various physical and mental disorders among them, of which depression seems to be the commonest of all. Depression and malnutrition among older adults appear to be strongly associated. Therefore association between depression and nutritional status of 82 older adults (31 male; 51 female) of Burdwan Town, West Bengal was studied. The level of depression was assessed by Geriatric Depression Scale (GDS- 30) and nutritional status was assessed by Mini Nutritional Assessment (MNA). According to GDS-30, 74.2 per cent and 25.8 per cent male participants were found to be normal and with mild depression, respectively. Whereas, 60.8 per cent and 39.2 per cent female participants were normal and with mild depression, respectively. No severe depression was found in either of these two groups. According to MNA, 54.8 per cent male and 54.9 per cent female participants had normal nutritional status while 45.2 per cent male and 45.1 per cent female participants were at risk of malnutrition.

nutrition. No malnutrition was found among the individuals of the two groups. Significant ($p < 0.05$) negative correlation was found between MNA scores and GDS scores for both male and female participants.

Keywords: Depression, Nutritional status, Older women, Older men

In the past few decades, worldwide there was a notable increase in the proportion of older adults (60 years or above) population. Among them, both physical and mental disorders are prevalent. Depression is considered one of the major non-communicable diseases that may increase with age. Among older adults, both under-nutrition and depression are emerging public health issues (Al-Rasheed, *et al.*, 2018; Boyangari, *et al.*, 2018). World Health Organization also projected that the population of 60 years or above will have new challenges to healthcare (WHO, 2008). People in old age have a great mind-body connection. Psychiatric illness among older adult individuals may significantly influence physical health conditions. In some cases, depression is also associated with loss of appetite, weight loss, and considerable malnutrition among the older adult population (Ahmadi, *et al.*, 2013; Al-Rasheed, *et al.*, 2018). There are some risk factors for geriatric depression. These are poor health, brain injury, low folate, and vitamin B₁₂ (Dao, *et al.*, 2018). Though depression is not necessarily a part of aging, older individuals may have an increased risk of experiencing depression. Sometimes older adults also don't understand this depressive condition. Depression and malnutrition may lead to unfavorable outcomes (Joshi, *et al.*, 2003). So, the objective of this study was to determine the prevalence of depression among free-living older adults and its association with their nutritional status.

Materials and methods

Study type and study design: A cross-sectional study was done among randomly selected 82 older adults (31 males and 51 females), ages varying from 60 years and above, from Ward 16 of Burdwan Town, West Bengal. All the participants were healthy and free from any kind of severe physical or mental disorders/diseases. The objective of the study was explained thoroughly to them and their oral consent was taken before the study. Due to the covid-19 pandemic situation

data collection was done by online or telephonic interview method.

Assessment of depression: The presence of possible depression among the older adult participants was assessed by Geriatric Depression Scale (GDS-30). The total score of this scale is 30, which is graded as normal (0-9), mild depression (10-19), and severe depression (20-30) (Vellas, *et al.*, 2006)

Assessment of nutritional status: Nutritional status of the participants was assessed by using a longer version of the mini nutritional assessment (MNA^(R)). The total MNA score is 30 and it is graded as normal nutritional status (24-30), at risk of malnutrition (17-23.5) and malnourished (<17) (Yesavage, *et al.*, 1993)

Statistical analysis: All data were entered into a Microsoft Excel worksheet to check for any possible errors. To observe the prevalence of depression and nutritional status, data were expressed as percentages for both males and females separately. The correlation between depression and nutritional status was calculated by Spearman's rank correlation coefficient (ρ) and $p \leq 0.05$ was considered statistically significant.

Result

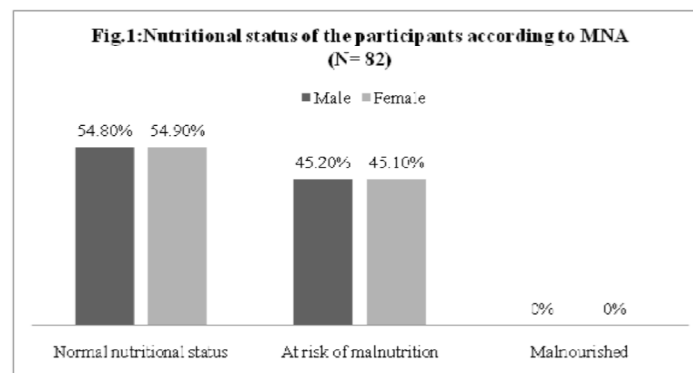


Fig.1 depicts the nutritional status of the older adult participants as assessed by a mini nutritional assessment. 54.80 per cent of male and 54.9 per cent of female participants were found to have normal nutritional status, whereas 45.20 per cent of male and 45.1 per cent of female participants were at risk of malnutrition. No malnourished

participant was found in both groups.

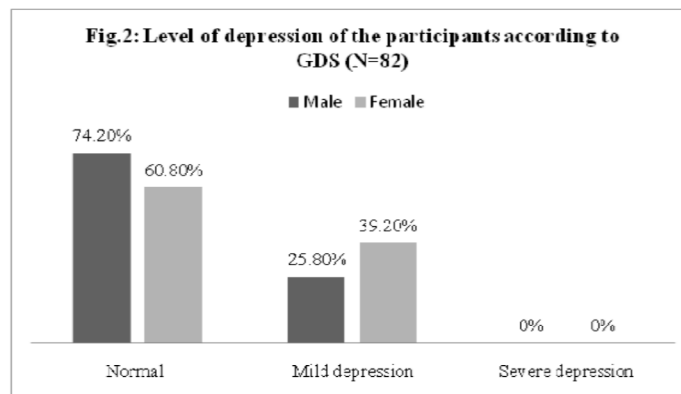


Fig.2 shows the level of depression of the participants as tested by GDS-30. 74.20per centof male and 60.80per centof female participants were normal (not suffering from depression), whereas 25.80 per centof male and 39.2per centof female participants were suffering from mild depression. No severe depression was found in both groups.

Table 1

Variables	Correlation matrix of MNA and GDS (N=82)			
	GDS rho		MNA rho	
	Male(N= 31)	Female (N=51)	Male (N=31)	Female (N=51)
GDS	1.000	1.000	-0.435*	-0.714*
MNA			1.000	1.000

*Significant at 0.05 level

Table 1 shows the correlation matrix of MNA and GDS. When testing the correlation between nutritional status and depression, a significant negative correlation was found between MNA scores and GDS scores for both males ($\rho = -0.435$, $p < 0.05$) and female participants ($\rho = -0.764$, $p < 0.05$). This significant inverse correlation indicates that the nutritional status of both male and female participants was good when there was less or no depression.

Discussion

The study revealed that none of the participants of the study

was having severe depression. However, mild depression was found among 25.8per cent male and 39.2per cent female older adults.

54.8per cent of male and 54.9per cent of female older adults were found to have normal nutritional status. At risk of malnutrition was found among 45.2per cent of male and 45.1per cent of female participants. None of the participants was having malnutrition. Though malnutrition was absent in both the groups, a significant ($p < 0.05$) inverse correlation was found between depression and the nutritional status of the participants. This significant inverse relationship indicates that the nutritional status of both male and female participants was good when there was less/no depression or *vice versa*.

Late-life depression is associated with many factors and people suffering from it are most likely to develop malnutrition or vice versa (WHO, 2017). Depression is associated with dysphoric mood and sadness and people often feel a loss of interest in life and activities (German, *et al.*, 2011). Therefore, the prevalence of depression can affect various health-related issues like nutritional status which is also observed in this study and the trend is similar for both males and females.

Some reports from previous studies also show that late-life depression and its association with nutritional status is a common phenomenon during old age in India (Arsalani, *et al.*, 2017; Boyangari, *et al.*, 2018; Maity, *et al.*, 2019) and abroad (Islam, *et al.*, 2021;) which requires early detection and appropriate intervention.

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Efficacy of Cognitive Behavioural Intervention in Improving Everyday Memory Function of Older People

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ABSTRACT

The present study focused on the assessment of everyday memory in the aged (N=600) and the efficacy of the intervention. The main sample includes men and women in the age group of 60-75, and above. Everyday memory performance was assessed among older subjects and after identifying the subjects with poor everyday memory. The intervention was carried out on a select sample of older men and women (n=120) with poor everyday memory performance. The interventions were carried out on a select sample of subjects. The subjects were exposed to the intervention module by using cognitive behavioral memory interventions for everyday memory. The results are discussed in the light of psychological interventions to improve the quality of life of older men and women particularly with poor everyday performance.

Keywords : Everyday memory, CBMEM, Interventions, Older people.

According to statistics, 70 per cent of older adults report that they have memory problems, but objective tests are needed to determine if they have a mild cognitive impairment, which is also

known as benign senescent forgetfulness/age-associated memory decline and early dementia. Mild cognitive impairment is a transitional stage between normal aging and Alzheimer's disease. We are not sure how prevalent it is? Probably 17 per cent to 34 per cent of elderly people have mild cognitive impairment. Several medical conditions and other factors can cause memory problems in older adults including urinary tract or respiratory infections, mini-strokes, vitamin B₁₂ deficiencies, going under anesthesia, and medication side effects (Fleming, 2003, Alzheimer's Association. 2003). Memory is considered a yardstick to old age.

Everyday memory refers to memory operations that routinely occur in one's daily environment. Examples of everyday memory include remembering names, remembering plans for the day, recalling items that one needs to purchase at the grocery store, remembering to take medications, and remembering telephone numbers, directions, or recent newsworthy events. The hallmark of everyday memory and associated research, then, is that it involves the performance of tasks that occur naturalistically in the real world. This is in contrast to typical laboratory tasks on memory, in which individuals may be asked to do things not typical of what they do in the real world, such as memorize unrelated lists of words or pictures, remember to press a key when a certain word appears on a computer screen, or perform mental arithmetic and report a series of answers later.

For the human brain, there's no such thing as over the hill. Psychologists researching the normal changes of aging have found that although some aspects of memory and processing change as people get older, simple behavior changes can help people stay sharp for as long as possible. Old age is a period in which unique developmental work can be accomplished. Many people in their late years of life make their remaining time more purposeful through day-to-day activities. Reminiscing is an active process of recalling past events. It enables a person to see the significance of his or her life as death draws nearer. In general people in their old age feel happy to memorize their past through reviewing rather than their apprehensive future. Otherwise called Autobiographical memory i.e., a person tries to memorize his own life (Lalitha & Jamuna, 2015; Lalitha & Aswartha Reddy, 2020).

The measure of cognitive failure was negatively related to the measures of intelligence and I-E locus of control and positively relates to anxiety (Dwivedi, 1988; Dwivedi & Misra, 1991) and yielded a positive relationship with internal control and scores on standard progressive matrices and negative relationship with external control and anxiety. These findings implicate those memory beliefs are importantly linked with personality and intellectual functions. In addition to improving real memory performance, research on memory interventions can improve subjective memory (Gross, *et al.*, 2011). The method for efficient remembering has been well known for more than 60 years. Woodrow (1927), a Researchers say that collaboration is an important component in cognitive performance, particularly in day to day life of older men and women (Hulicka, 1982; Saczynski, *et al.*, 2004). Dubey (1996) developed the Cognitive Dysfunctioning Scale, which is applicable in clinical settings of Neurology and Psychiatry as a routine mental examination. It evaluates higher mental functioning. The psychologist suggested several strategies through which the memory can be improved e.g., learn by wholes rather than in parts; use rhythms, rhymes, and groupings for the items you are memorizing; pay attention to meaning and picture the items in your head which you are going to memorize and have confidence in your ability to memorize (Das, 1998).

Gupta and Kaur (1996) in a study of episodic memory in 40 young and 40 elderly found that elderly females performed significantly better than elderly males in inferential processing. The overall findings of age deficit in information processing are attributed to general age-related slowing and reduced working memory and attentional capacity (Gupta & Srivastava, 2000). Many studies on healthy subjects established the importance of memory self-efficacy in memory training programmes. MSE improves memory test performance in healthy subjects without traditional memory training (Valentijn,*et al.*, 2006). Intervention programs with the enhancement of memory in natural everyday activities have much potential to offer (Studenski, *et al.*, 2006).

Psychotherapeutic interventions utilizing cognitive-behavioral strategies have been used widely with older adults. To appropriately

adapt these techniques, characteristics unique to older adults must be taken into account. These factors include aspects of the social environment, cohort effects, and cognitive changes with aging, personality, and emotional development, which have been described in an emerging body of research literature from the field of gerontology. In addition, clinical studies have examined the efficacy of cognitive-behavioral interventions in treating older clients for anxiety, depression, insomnia, and other disorders. Current empirical evidence in gerontology and treatment outcome research informs the practice of psychotherapy in this population and provides recommendations for conducting therapy with older adults (Satre, *et al.*, 2006). In recent years, training programs designed specifically to enhance memory among older adults have proliferated. As part of Cognitive training programs, memory training programmes are planned with the notion that cognition is affected in old age (Acevedo & Lowenstein, 2007; Rebok, *et al.*, 2007; Hertzog, *et al.*, 2008).

Bagwell and West (2008) study on compliance found that the trainees were identified as active (compliant with training regimens) or inactive trainer ratings based on attendance, homework completion, and class participation. The active group showed significantly greater training-related gains than the inactive group and the control group on most measures. Improving everyday memory through simple ways does have an impact on promoting feelings of self-efficacy and self-worth and feelings of functional autonomy among the elderly. This research outcome has social relevance. In this direction, an attempt would also be made to disseminate the outcome of the research study in the form of some tips to improve everyday memory performance as handouts to the elderly.

The Selective Optimization with Compensation (SOC) model for lifespan development (Baltes & Baltes, 1989) holds that as age increases our goals change from growth to maintenance. People use their physical, mental, and social resources to minimize their losses when they have difficulties but they feel helpless when memory starts to fail. An intervention was carried out to examine differences in memory self-efficacy in the post-intervention stages through the use of the Memory Functioning Questionnaire, Memory Control

Inventory, and the Knowledge of Memory and Aging Questionnaire. Results found that memory self-efficacy levels in the oldest-old were the same as their younger counterparts, implying that subjective memory appraisals remain relatively stable in later life (Bethany & Lyon, 2014). The aforementioned review of studies on interventions highlighted some of the methods used in memory training. Several efficient methods were mentioned for remembering. Studies show that paired associates and list learning can be improved when an appropriate mnemonic technique is provided for elderly persons, especially by reducing the number of omission errors. Research has suggested that older adults are less efficient in using categorization strategies than younger adults (Lalitha, 2015a, 2015b; Lalitha & Jamuna, 2015). Everyday memory was significantly correlated with depression among community-dwelling older people (Aswarth Reddy & Lalitha 2018). Studies carried out among older people indicate that there are subgroup differences in the everyday memory performance. It was also found that health status was significantly correlated with everyday memory performance (Aswarth Reddy & Lalitha, 2019; Lalitha, 2021).

Memory Interventions

Commonly, both old and young people often complain of poor memory. Some find it very difficult to remember names or numbers and quickly forget them again (Leech & Witte, 1971; Labouvie-Vief & Judith, 1976). Others find that they cannot recall old familiar names of people, things, or places. Nevertheless, people also grow apprehensive about their poor memory, observing an increasing decline in mental powers or inability to keep pace with the demands of their daily life. Further, it is observed that if memory is systematically trained, its previous performance can largely be regained. The method for efficient remembering has been well known for more than 60 years. Woodrow (1927), a Psychologist suggested several strategies through which the memory can be improved e.g., learn by wholes rather than in parts; use rhythms, rhymes, and groupings for the items you are memorizing; pay attention to meaning and picture the items in your head which you are going to memorize and have confidence in your ability to memorize (Das, 1998).

A major chunk of memory training studies mostly on younger elderly subjects have addressed transfer across tasks, that is, the ability to use a mnemonic device as a task not encountered during training, have revealed small or nonexistent transfer effects (Scogin, *et al.*, 1985; Roberts & Wilson, 1986; Scogin & Bienias, 1998; Stigsdotter & Backman, 1989; Rebok & Balcerak, 1989; Stigsdotter & Backman, 1993a, 1993b; Weaver, 1995). However, two exceptions to this pattern have been reported. Yesavage and Rose (1983) trained subjects to use the method of loci in verbal free recall and found transfer to a paired-associate learning task. Anschutz, *et al.*, (1985) also trained subjects in the method loci and examined transfer from verbal free recall task to a more ecological task, a grocery list, as well as, transfer from a lab setting to a real-life setting and found transfer under both conditions. Research shows that near transfer as opposed to far transfer effects, indicating fairly narrow limits of generalization (Blieszner, *et al.*, 1981; Baltes, *et al.*,). Many studies have demonstrated that younger subjects perform better than older subjects across a wide variety of memory tasks (Hultsch & Dixon 1990). One among several offered explanations for the poor performance of older adults on episodic memory tasks is their tendency not to use effective encoding strategies spontaneously (Light, 1990; Salthouse, 1991a, 1991b). Cognitive restructuring techniques may help community-dwelling older adults to gain and or control over their beliefs about memory and thereby enhance their memory performance (Caprio & Fry, 1996). Improvement of subjective memory functioning was enhanced by including pertinent task skills such as the use of imagery and by including interventions to improve participants' attitudes toward the effects of aging on memory functioning (Floyd & Scogin, 1997). The aforementioned review of studies on interventions highlighted some of the methods used in memory training. Several efficient methods were mentioned for remembering. Studies show that paired associates and list learning can be improved when an appropriate mnemonic technique is provided for elderly persons, especially by reducing the number of commission errors. Research has suggested that older adults are less efficient in using categorization strategies than younger adults. Some researchers emphasize the use of certain

organised memory strategies as external memory aids in managing memory problems (Andrews, *et al.*, 1997). Behavioural interventions applying mnemonic strategies conducted in small groups have been very helpful and successful at improving the memory performance of adults in the initial stage of memory problems (McDougall, 1999).

A total of thirty-five studies were selected for further analysis; twenty-seven RTCs and eight clinical studies. The clinical studies will be discussed separately. Of the twenty-seven RCTs, twenty-one intervention studies included a population of healthy older adults (Basak, *et al.*, 2008; Buiza, *et al.*, 2008; Buschkuehl, *et al.*, 2008; Slegers, *et al.*, 2008; Talib, *et al.*, 2008; Tranter and Koutstaal, 2008; West, *et al.*, 2008; Carlson, *et al.*, 2008; Noice and Noice, 2009; Smith, *et al.*, 2009; Bottiroli and Cavallini, 2009; Hastings and West, 2009; Bailey, *et al.*, 2010; Berry, *et al.*, 2010; Borella, *et al.*, 2010; Cavallini, *et al.*, 2010; Fairchild and Scogin, 2010; Klusmann, *et al.*, 2010; McDougall, *et al.*, 2010; Mozolic, *et al.*, 2011; Richmond, *et al.*, 2011) and six intervention studies included a population of people with MCI (Troyer, *et al.*, 2008; Wagner, *et al.*, 2008; Barnes, *et al.*, 2009; Kinsella, *et al.*, 2009; Jean, *et al.*, 2010b; Tsolaki, *et al.*, 2011;). The results show evidence that cognitive training can be effective in improving various aspects of objective cognitive functioning; memory performance, executive functioning, processing speed, attention, fluid intelligence, and subjective cognitive performance. However, the issue of whether the effects of cognitive interventions generalize to improvement in everyday life activities is still unresolved and needs to be addressed more explicitly in future research. Reijnders, *et al.*, (2013). Cognition-focused interventions are interventions that directly or indirectly target cognitive functioning as opposed to interventions that focus primarily on behavioral (for example, wandering), emotional (for example, anxiety) or physical (for example, sedentary lifestyle) function. Other types of cognitive interventions include: "Training in specific tasks" such as systematic training of routines, (Kim, 2015) interventions with help of "virtual reality"- for training specific abilities such as memory, attention, or functional tasks (such as crossing the street, (Kramer, *et al.*, 2004) and "Training in social abilities" such as parent-child relationships or relations with a peer.

In sum, a full understanding of everyday memory functioning of older adults can occur only if the person, the cognitive demands of a task, and the environment are considered together. To the extent that environmental or task demands on cognitive resources are high; older adults will likely function less effectively than younger adults. For example, if an older adult who has just had heart surgery has to take six new medications upon returning home, he or she may not fare well, because the cognitive demands of this new task are high due to its unfamiliarity. However, this same adult might take six medications with a high degree of accuracy if this is a long-term medication regimen because cognitive resource demands would be low due to the high familiarity with the task. Much remains to be understood about everyday memory in older adults, and this is a fertile ground for future research.

Keeping the above in view the present study was planned with the following objectives :

- To assess the level of Everyday memory performance among older men and women.
- To assess the efficacy of cognitive-behavioral interventions in a select sample of older people.

The following hypotheses were formulated

- There is a significant difference in the Everyday memory performance in different sub-groups.
- There is a significant difference in the Everyday memory performance between pre-intervention and post-intervention scores among the elderly.

Sample of the study

(i) Main Study Sample

The subjects of the present investigation were 600 community-living elderly men and women, who were drawn from the 60-65, 66-70, and 71-75 age groups. The multistage random sampling technique was used to draw the subjects from rural and urban areas of the Rayalaseema region which covers five districts namely Kadapa, Chittoor, Nellore, Ananthapur, and Kurnool of Andhra Pradesh. Only subjects who were cognitive, healthy, community-dwelling, and those without any marked disabilities were included in the main sample.

(ii) Intervention Sample

The subjects in the main study 120 men and women (71 yrs to 75 yrs) were drawn from the main sample to constitute the sample for the intervention study. From this group, 60 subjects who were willing to participate were selected as the subjects for the Experimental group. They were exposed to training. No training was given to the subjects in the control group (n=60). The samples were matched on their age, income, education, general health, and disability status, and the communication and comprehension of the subjects were assessed before they include in the intervention sample.

Tools Used In the Study*Assessment of Everyday Memory*

The everyday memory questionnaire was developed by John Harris and Alan Sunderland (Sunderland, Harris & Baddeley, 1983) to test lapses in everyday memory. The EMQ consisted of 28 items, each Describing everyday activities, which may involve memory failure. A 9-point scoring was used with a scale of 1(Not at all in the last six months); 2 (about once in the last six months); 3(more than once but less than once a month); 4(About once a week); 5(more than once a month but less than once a week); 6(About once a week); 7 (more than once a week but less than once a day); 8(About once a day); 9(More than once a day). A total score of 27-58 means that your memory is generally good; 58-116 is the average; 116-243 is rather below average.

Intervention Module

To realize one of the objectives of the present study, In the Intervention stage, the intervention plan of the present study would be based on an eight-session model based on the Cognitive Behavioural Model of Everyday memory. Eight session model includes general introduction to old age, specific introduction, cognitive status in old age- memory problems, enactive mastery experience (Exposure repeated practice); categorize, create a word, first-letter cue, review, search, vicarious experience (relevant and self-modeling)association, retrieval, retracing, elaborate, verbal persuasion (Exhortation suggestion), calendar, person, place, physiologic and affective states

(desensitization), control, enjoy, imagine, windup - review, practice, and troubleshooting.

The procedure of Data collection

The present study includes only subjects who were cognitively intact, healthy, and community-dwelling, and those without any marked disabilities were included in the main sample. As the present investigation required a calm, quiet, and noninterference testing location to ensure concentration, attention, motivation, and enthusiasm towards the tests, care was taken to avoid any interference and involvement of other family members while administering the tests, as it may cause disturbance and cause lack of attention and concentration. The entire testing was undertaken by the investigator himself. The selection of location and testing commenced in the first session of the interview itself if subjects were free and willing to participate. However, if they were not free, an appointment was fixed for a later date. The selected tool Every Memory questionnaire along with a Personal data sheet was administered to the sample.

Conducting Interventions

Several studies were of an interventional nature that showed the effect of training on everyday memory performance. These interventions did bring about some positive effects on the everyday memory of the individual. For the present purposes, it was hypothesized that interventional training would create a significant difference between the pre and post-test scores on everyday memory status. It is evident from the literature that practice or training significantly helps in improving one's everyday memory. The intervention plan of the present study was carried out by the selected module and also based on the Cognitive Behavioral Model of Everyday memory. This eight-session model was derived from Bandura's self-efficacy theory (Bandura & Locke, 2003; McDougall, 2009).

The subjects in the intervention sample were individually contacted and rapport was established and the importance of the

intervention was explained to them. Intensive training was extended only to the subjects in the Experimental group and no training for the Control group subjects in Pre and Post testing sessions. To maximize the effectiveness of the intervention at least 30 minutes were allotted for the first session and 30-45 minutes for other additional sessions. Practice at home was emphasized. The pre and post-intervention performances of these two groups were compared to evaluate the efficacy of the intervention. The intervention module was prepared in Telugu to make the subjects follow the content easily.

Pre and post-testing

During the pre-testing session the everyday memory was assessed. The subjects with poor performance on everyday memory were selected. The subjects were matched for their age, education, income, general health, and disability status. After giving intervention the pre and post-testing were carried out to see the efficacy of the intervention. The obtained data were analyzed with suitable tests.

Results

Firstly, the data related to Everyday memory in different sub-groups were analyzed

The data relating to the level of everyday memory in different age groups show that in the age group of 60-65yrs only 10.5 percent reported good memory, 33.5 reported average memory, and 56.0 percent reported below-average everyday memory. In the age group of 66-70 years, only 3.5 percent reported good memory 45.0 percent with average, and 51.5 percent with below-average everyday memory. In the age group of 71-75 years, only 2 percent reported good everyday memory 28 percent average memory and 70 percent reported below-average everyday memory. It is clear that as age increases the problems related to everyday memory also increase, but another observation is that good everyday memory was reported by the 60- 65 yrs age group than the other two groups. The locality-wise scores also show that a high percentage (62.0) reported below-average everyday memory in rural areas compared to urban areas (56.0) and 4.7 percent reported good everyday memory in the rural area, 6 percent reported in the urban area.

Table I

shows the level of Everyday Memory Performance in different subgroups.

Sl. No.	SUB-GROUP	N	Level of Everyday Memory					
			Below Average (f)	%	Average (f)	%	Good (f)	%
1	AGE							
	60-65	200	112	56	67	33.5	21	10.5
	66-70	200	103	51.5	90	45.0	7	3.5
	71-75	200	140	70	56	28.0	4	2.0
2	LOCALITY							
	Rural	300	186	62.0	100	33.3	14	4.7
	Urban	300	168	56.0	114	38.0	18	6.0
3	GENDER							
	Male	300	180	60.0	101	33.7	19	6.3
	Female	300	174	58	113	37.7	13	4.3
4	EDUCATIONAL STATUS							
	Without Formal Edn.	237	140	59.1	80	33.8	17	7.2
	Primary education	207	121	58.5	77	37.2	9	4.3
	Secondary education	127	84	66.1	38	28.9	5	3.9
	Higher education	29	9	31.0	19	65.5	1	3.4
5	ECONOMIC STATUS							
	Low Middle	221	123	20.5	85	14.2	13	2.2
	Middle	278	177	29.5	84	14.0	17	2.8
	Upper middle	101	54	9.0	45	7.5	2	0.3

The data on gender also shows that in the males 60 percent reported below-average everyday memory, 33.7 Percent reported average memory, and 6.3 percent good memory. In the female group, 58 percent reported below-average everyday memory, 33.7 percent reported average everyday memory, 4.3 percent good everyday memory and it is clear only 6.3 percent of males reported good everyday memory compared to females (4.3 percent), and scores indicate that males are (60%) below average everyday memory compared to the females (58%). The educational status-wise scores show that Good everyday memory was reported by those subjects without formal education and compared to other subgroups, it is clear that those who are with higher education reported average everyday memory of 65.5 per cent which is very high compared to another subgroup in education. It is a fact that as the educational level increases there is a decline in the below-average everyday memory as reported, indicating the impact of education on

everyday memory performance. Economic status wise also it is clear that the subjects who belonged to middle income reported a high percent (29.5%) of below-average everyday memory compared to low middle and upper-middle-income groups. Overall trends clearly show that only 10 percent of the sample reported good everyday memory indicating the incidence of memory problems in the healthy community-living elderly.

ANOVA results related to Everyday Memory in different sub-groups:

Table II

Summary of ANOVA for Everyday Memory by Age, Gender, and Location Groups.

Source of Variance	Sum of Squares	D.F	Mean Square	F Value
AGE(A)	27459.54	2	13729.77	12.14**
GENDER(G)	0.205	1	0.20	0.00@
LOCATION(L)	9467.22	1	9467.25	8.37**
A X G	1375.79	2	687.89	0.60@
A X L	22868.25	2	11434.12	10.11**
GX L	11.43	1	11.43	0.01@
A X G X L	212.29	2	106.14	0.09@
Error	665012.22	588	1130.97	
**P<0.01; @Not significant				

A one-way ANOVA is calculated to see the interaction between different sub-groups concerning Everyday memory. The result of ANOVA (Table. II) shows the main effect of age, gender, location, education, family, and economic status. The trend show that the main effect of age, (F=12.14; P<0.01), Location (F=8.37; P. 0.01) and also interaction between age x location (F=10.11; P <0.01) were significant. But other main and interaction effects related to gender, age x gender, gender x location, and age x gender x location were not significant. The results related to education, family, economic status, and their

interaction with Everyday memory (vide Table. III) indicate that education ($F=6.79$; $P<0.01$) was the only significant main effect on Everyday memory whereas the family, economic status main effects were not significant. And about interactions, the variables like education x family, education x economic status, family x economic status, education x family x economic status, interactions were not significant for the performance of everyday memory (vide Table. III). The above results highlight the important role played by certain socio-demographic factors in everyday memory.

Table III

Summary of ANOVA for Everyday Memory by Education, Family, and Economic Status Groups.

Source of Variance	Sum of Squares	D.F	Mean Square	F Value
Education (EDN)	15915.59	2	7957.79	6.79**
Family(FA)	475.64	1	475.64	0.40@
Economic status (EST)	3288.90	2	1644.45	1.40@
EDN X FA	800.73	2	400.36	0.34@
EDN X EST	2886.52	4	721.63	0.61@
FA X EST	2173.17	2	1086.58	0.92@
EDN X FA X EST	9085.71	4	2271.42	1.93@
Error	681931.50	582	1171.70	
** $P<0.01$; @Not significant				

The first objective of the present study was to examine whether there are differences in age groups in naturalistic everyday activities. Here, the data clearly showed that young-old (60-65yrs) outperformed old-old adults. Generally, studies report differences between young-old, old-old, and oldest-old. The age differences may be attributed to the breakdown of information while registering. It is a well-documented fact that memory problems are dependent on information processing, and sensory impairments especially visual and auditory due to age. The degraded encoding leads to differences in the memory performance. The observed impact of gender on everyday memory scores was surprising. An examination of the scores

indicates that men scored significantly higher than women in everyday memory. Overall scores show that there are significant differences among age, location, and education groups compared to gender, family, and economic status in everyday memory performance.

Results related to Intervention

One of the objectives of the present study is to test the efficacy of the intervention in improving memory performance in the sample of older adults. The results of memory interventions are discussed in this subsection. Further analysis was carried out to see the efficacy of the intervention on everyday memory performance. The intervention is carried out according to the procedure with the selected intervention module. The Pre and Post-tests were carried out according to the procedure. Everyday memory performance was tested before intervention (pre-test) and after intervention (post-test). The obtained data from the control group and experimental group were analyzed to test the efficacy of the intervention.

A cursory glance at the results of the intervention shows that the data on everyday memory performance (see Table IV) shows that the Control Group performance is almost similar in pre and post-testing conditions and differences were not significant ($t=1.07$, respectively) whereas the improvement in the memory performance was significant in the Experimental group ($t= 4.32$ respectively).

Table IV

Shows the analysis of Intervention on Everyday Memory

Sl. No.	Sub-Groups	N	Mean (S.D.)	't' value
1.	Control Group			
	Pre-testing	60	125.13 (32.76)	1.07@
	Post –testing	60	125.26(32.89)	
2.	Experimental Group			
	Pre-testing	60	124.0(23.23)	4.32**
	Post –testing	60	119.73(22.34)	

From the above, it is clear that the interventions helped the subjects to enhance their everyday memory performance compared to those who do not receive interventions. As stated earlier, the

objective of intervention in the present study was merely to demonstrate that such an intervention is feasible to improve the memory competence in the community living elderly in India. As no such studies existed, an effort was made on a small select sample to carry out an intervention. The evaluation of Pre and post-test performance scores demonstrated the efficacy of memory training.

The tenability of Hypothesis – I

Hypotheses-I: There is a significant difference in the Everyday memory performance in different sub-groups.

The results indicated there is a significant difference in the Everyday memory performance among different sub-groups, and the following sub-hypothesis is accepted.

Hypotheses-II: There is a significant difference in the Everyday memory performance between pre-intervention and post-intervention scores among the elderly.

The results showed that there is a significant difference in the Everyday memory performance between post-intervention scores, among the elderly, the following sub-hypothesis is *accepted*.

Important findings

- Overall trends clearly show that majority of the sample reported poor everyday memory indicates the incidence of memory problems in the healthy community living elderly is high and need special attention.
- The data relating to the experimental group shows significant differences concerning everyday memory performances after the intervention.
- The efficacy of the intervention shows that the experimental group benefited from the intervention given to the selected sample by using the cognitive behaviour model of the everyday memory module.
- Finally, the result shows that everyday memory performance is influenced by the relationship of modifiable risk factors such as effect, health, and self-efficacy beliefs with everyday functional performance, which directly improves the quality of life elderly.

Implications: In an intervention study like this, inter-individual differences are quite obvious, where some people will be benefited from training through internal strategies, and some may benefit when external strategies are used. Therefore, to accrue long-term benefits only tailor-made intervention packages need to be planned. However, the present intervention can be considered as a pilot study bringing out the affirmation of beneficial effect to the individual. The present intervention can be considered as an experiment *in situ* concerning India. The findings have important implications for a country like India, where seventy million elderly live and where these types of studies so far have not been carried out. The intervention results have a lot of practical implications.

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Changes in life expectancy in Sri Lanka and Kerala: An analysis of its patterns and causes

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ABSTRACT

Although life expectancy increased significantly from 1920 to 1970 in Sri Lanka and Kerala, its subsequent increase has been modest with divergent trends. This study investigates the trends by analysing the contributions of age groups and causes of death on changing life expectancies from 1970-to 2019. Using the methodology proposed by (Olshansky and Ault, 1986), the Temporary Life Expectancy (TLE) was estimated and decomposition of life expectancy by age and causes of death was carried out. The TLE values show that further potential gain to life expectancy increments in Sri Lanka and Kerala is in the older ages while the decomposition analysis indicates that the contribution of older ages to life expectancy was minimal. Furthermore, the contributions of many degenerative and non-communicable diseases were either low or detrimental, especially in the older ages. Even though there are many programmes and policies

launched to address the challenges of degenerative and non-communicable diseases, the impact of such ongoing interventions could take some time to reflect in life expectancy increments.

Keywords: Decomposition of Life Expectancy, Cause of death, Aging and Public Health

The drastic reduction in mortality and the consequent increase in life expectancy in Sri Lanka and Kerala during the twentieth century had attracted worldwide attention. Despite being in the developing regions, Sri Lanka and Kerala were able to achieve high life expectancy. It was against the notion that economic development and improvement in nutritional intake were unavoidable prerequisites for mortality reduction and life expectancy increment as seen from the experiences of developed countries (WHO, 1984). More than economic factors, socio-cultural factors particularly education and access to primary healthcare were considered as the propelling factors in reducing mortality and thus achieving increased years in life expectancy in both Sri Lanka and Kerala. The pace of increment in life expectancy was at a rate par with the developed countries that by the beginning of the 1970s, it had reached above 60 years for both the sexes in Sri Lanka and Kerala. However, after the 1970s the life expectancy in both places became stagnant, while many developed countries continued to keep up the pace. At this juncture, a possible question may be asked about the reasons behind the slowness of life expectancy increment in Sri Lanka and Kerala.

The gradual increase in life expectancy after achieving a certain level, say about 70 years could be attributed to the epidemiological transition that happened during this period in Sri Lanka and Kerala. The epidemiological transition is characterised by early increments in the life expectancy that emanates from the reduction of deaths caused by pandemics, malnutrition, childhood diseases, and maternal causes. This reduction in death rates could be attributed to the improvement in the provision of primary healthcare, increased nutritional intake, and changes in socio-economic-cultural factors. This transition led to a shift in the pattern of causes of death from communicable/primary healthcare-

oriented diseases to lifestyle/degenerative diseases and this transition phase was called the 'age of degenerative and man-made diseases' (Omran, 1971; Omran, 1998). After this stage, came the 'age of delayed degenerative diseases' during which the age at which degenerative diseases become lethal is postponed to such an extent that life expectancy is propelled into or even beyond the eighth decade of life (Olshansky & Brian, 1986). Though many studies corroborate this transition in many developed countries, especially in Europe, there is a dearth of such an inquiry in the case of Sri Lanka and Kerala.

By exploring the transition in the life expectancy changes in Sri Lanka and Kerala, this paper explores the following questions: (i) what is the overall pattern of change in life expectancy in Sri Lanka and Kerala over the last five decades, and (ii) what is the contributions of different age groups and disease groups on life expectancy?

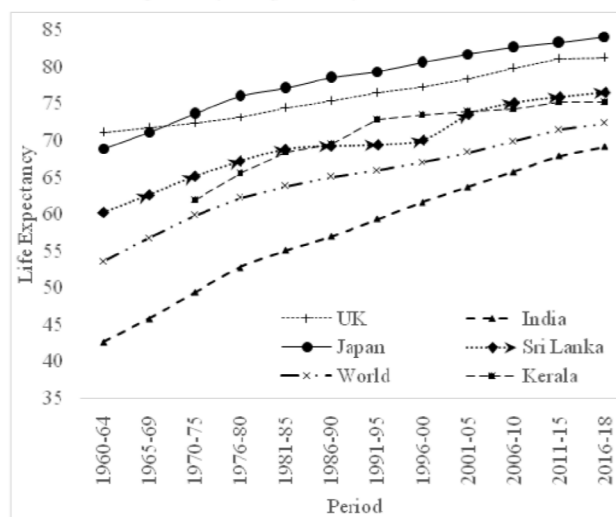
Methodology

This study used secondary data on mortality and causes of death that are publicly available. The estimated life tables data for Sri Lanka for the years 2000, 2005, 2010, 2015, and 2019 were taken from the Global Health Observatory data repository of the World Health Organisation (World Bank, 2021). To estimate the life expectancy for Kerala, the Age-Specific Death Rates (ASDR) and life tables from the Sample Registration System (SRS) were used (RGI-SRS, 2019). The mortality data from the SRS is based on a dual recording system. It consists of a continuous enumeration of deaths in a sample of villages/urban blocks by a resident part-time enumerator, and an independent six-monthly retrospective survey by a full-time supervisor, and the final death rates are calculated after matching the cases from these two sources.

To analyse the impact of major disease groups in Sri Lanka, the study used causes of death data from the Department of Census & Statistics, Ministry of National Policies and Economic Affairs, Government of Sri Lanka for 2000 and 2014 (GOSL, 2021). The mortality data are classified according to the International

Classification of Diseases (ICD) by its 10th revision. The causes of death data for Kerala between 2000 and 2018 has been taken from the Medical Certification of Causes of Death (MCCD) survey published by the Registrar General of India (RGI). The MCCD data for Kerala is collected in the prescribed forms (separate forms for hospital deaths and non-institutional deaths) that conform to the international format of medical certification of cause of death as evolved by the World Health Organization (WHO). The causes of death are reported by the medical practitioners in line with the ICD-10th revision.

Figure 1.
Absolute change in life expectancy in Sri Lanka and Kerala



The study used the methodology proposed by Olshansky and Ault to understand the contribution of different age groups and disease groups to the changes in life expectancy (Olshansky and Ault, 1986). The study estimated the Temporary Life Expectancy (TLE) for major age intervals to realize the further amount of possible mortality reduction and life expectancy increment. Decomposition of life expectancy was carried out using Arriaga's method to calculate the exact contribution of age groups and disease groups to the changes in life expectancy (Arriaga, 1984; Arriaga, 1989). One of the

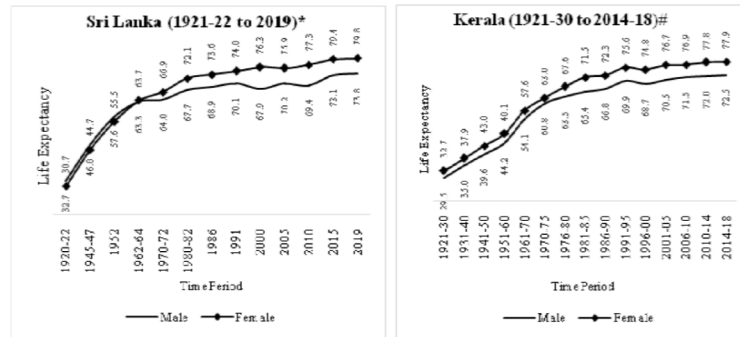
major lacunae of both mortality and causes of data is that it is not available for equal time intervals for Sri Lanka and Kerala, particularly for life expectancy analysis. If the time interval of existing life tables is highly unequal, in such context the study calculated the fresh life tables from the nearly available age-specific death rates for better comparison.

Figure 1 portrays the changes in life expectancy in Sri Lanka and Kerala along with India as well as selected developed countries (Japan, UK) and the world. It shows that during 1970-75 to 2016-18, the life expectancy at birth in Sri Lanka increased from 65.1 years to 76.6 years and that of Kerala increased from 62.0 years to 75.3 years. It is also worth noting that during this period the life expectancy in Sri Lanka and Kerala was much higher than the global average; however, it was comparatively lower when compared to developed countries such as Japan and UK. These two countries showed a steady increase in life expectancy during 1960-64 to 2016-18. By 2016-18, both the countries had crossed a life expectancy of 80 years at birth which is often considered the highest average life expectancy possible for human beings. However, the experiences of Sri Lanka and Kerala show that the life expectancy increment was slow particularly in the last two decades, leading to a convergence before attaining the maximum possible life expectancy.

A sex-wise disparity in life expectancy between Sri Lanka and Kerala during the period 1921-22 to 2019 is depicted in Figure 2. The life expectancy for both the sexes increased tremendously during this period. It was only around 30 years for both males and females in 1920 which increased to around 80 years for females in both the places while for males it was around 73 years. The gap in life expectancy widened from 2 years in 1920 to 6 years in 2019. The sex differences in life expectancy increased after 1970 both in Sri Lanka and Kerala as life expectancy increment was sluggish for males after the 1970s. It also indicates that the premature convergence of life expectancy in the recent years depicted in Figure 1 could be due to this slow growth of life expectancy for males.

Figure 2

Life expectancy at birth in Sri Lanka and Kerala during 1920-to 2019 for males and females



Source:[GOSL, 2021]

Source: Calculated from SRS

Temporary Life Expectancy

Table 1

Temporary Life Expectancy (TLE) in Sri Lanka and Kerala during 1971- to 2019

Year	Male				Female			
	1971	2000	2010	2019	1971	2000	2010	2019
Sri Lanka								
0-80	62.6	65.6	67.1	71.2	65.2	72.4	73.0	75.0
0-15	13.9	14.7	14.8	14.9	14.0	14.8	14.8	14.9
15-40	24.3	24.0	24.1	24.7	24.4	24.7	24.6	24.8
40-60	18.6	18.5	18.8	19.2	19.1	19.5	19.5	19.6
60-80	14.7	14.9	15.1	15.6	15.6	16.8	17.0	17.5
Kerala								
0-80	59.8	68.0	69.2	70.4	60.6	72.1	72.9	74.0
0-15	13.6	14.7	14.8	14.8	13.5	14.8	14.8	14.8
15-40	24.3	24.7	24.6	24.8	24.4	24.8	24.8	24.8
40-60	18.4	18.9	18.9	19.2	18.9	19.4	19.5	19.6
60-80	13.6	14.3	15.1	15.0	13.5	16.1	16.7	16.9

Source: Authors' Calculation

Table 1 records the Temporary Life Expectancy (TLE) for different age groups for both the sexes in Sri Lanka and Kerala from

1971-to 2019. A Temporary Life Expectancy (TLE) is interpreted as the average number of years that a group of persons at exact age x will live from age x to $x + i$. The TLE indicates the relative changes occurring in life expectancy within the age group because of mortality changes that happen only in that selected age group. Similarly, TLE from age at birth to age 80 is considered a more reliable indicator than e^0 , since it avoids the probable data quality problems in the oldest ages.

As depicted in Table 1, the TLE for males from birth to age 80 (maximum possible TLE is 80 years) in Sri Lanka was 62.6 in 1971 which increased to 71.2 in 2019, indicating that men born in 1971 will live an average of 62.6 years if they experienced the same mortality rates of the year in which they were born throughout their lives that now increased to 71.2 in the year 2019. Similarly, the TLE of females in Sri Lanka has increased from 65.2 to 75.0 during the same period. It is important to note that the achievement of TLE for males is comparatively lower than that of females in Sri Lanka from birth to age 80. A similar pattern is evident in the case of Kerala too, where TLE for males increased from 59.8 to 70.4 and for females increased from 60.6 to 74.0 from 1971 to 2019. The lower achievement of TLE for males from birth to age 80 indicates that mortality rates can be further reduced for males than females.

Between 1971 and 2019, the maximum TLE is attained during the younger ages (from 0 to 15 years and 15 to 40 years) for both the sexes can be seen in Sri Lanka and Kerala. In 2019, the TLE for the 0 to 15 years age group was 14.9 years for both the sexes in Sri Lanka while it was 14.8 for their counterparts in Kerala. Similarly, the TLE was 24.7 for males and 24.8 for females in 2019 in Sri Lanka, while it was 24.8 for both sexes in Kerala. However, the TLE in the older ages was low till 2019, particularly from age 60 to age 80 population. In this age group, TLE for females increased from 15.6 to 17.5 in Sri Lanka and 13.5 to 16.9 in Kerala from 1971 to 2019, while it only increased from 14.7 to 15.6 and 13.6 to 15.0 for their male counterparts in both the places, which indicates the advantage

of mortality reduction for females in the oldest ages than males. Moreover, it portrays the low reduction in mortality for males of the oldest ages even though they had more potential to reduce death rates. Furthermore, this could be the probable cause behind the gender disparity in the trends in life expectancy at birth which was discussed earlier.

Decomposition of Life Expectancy by mortality changes among age intervals

As per the theory of epidemiological transition, a substantial amount of contribution of mortality reduction in the older ages and consequent improvement in life expectancy to the higher ages is a notable feature of 'Age of delayed degenerative diseases. Therefore, to illustrate such gains in recent mortality reduction in the older ages and its relative importance in life expectancy gains, it is necessary to decompose the increment in the life expectancy by selected age groups. The absolute and percentage contribution from each age group to the life expectancy increment in Sri Lanka and Kerala in different periods is given in Table 2.

The Table portrays that both Sri Lanka and Kerala have experienced a positive increment in life expectancy at birth in 1971-2000, 2000-10, and 2010-19 for both males and females indicating a mortality reduction. While comparing such changes for the last two decades, the increment in life expectancy between the years 2000 and 2010 is comparatively lower in Sri Lanka than between the years 2010 and 2019 for both males and females. Such a pattern is visible for females in Kerala during the same period, while the increment of life expectancy at birth become negligible (<1 year) between the year 2010 and 2019 for their male counterparts. It is necessary at this juncture to understand the contribution of each age-groups to the actual life expectancy increment, as we expect a much more reduction in mortality and its contribution from the older ages since the younger ages already attained almost their maximum.

Table 2
*Decomposition of Life Expectancy (TLE) in Sri Lanka & Kerala
 during 1971-2019*

	Male			Female		
Sri Lanka						
Year	1971-2000	2000-10	2010-19	1971-2000	2000-10	2010-19
LE Change	3.69	1.52	4.36	9.05	0.96	2.55
0-15	3.97	0.40	0.80	4.51	0.44	0.69
	108	26	18	50	45	27
15-40	-0.97	0.68	2.29	1.38	-0.14	0.83
	-26	45	52	15	-15	33
40-60	-0.04	0.61	0.90	1.32	0.21	0.43
	-1	40	21	15	22	17
60-80	0.57	-0.14	0.32	1.68	0.36	0.30
	15	-9	7	19	38	12
80+	0.16	-0.03	0.05	0.16	0.09	0.30
	4	-2	1	2	10	12
Kerala						
LE Change	8.69	2.16	0.75	14.19	1.21	1.85
0-15	6.35	0.28	0.10	7.32	0.03	0.38
	73	13	13	52	2	21
15-40	1.12	-0.22	0.77	1.51	0.27	0.39
	13	-10	103	11	22	21
40-60	0.84	0.80	0.68	2.07	0.05	0.35
	10	37	91	15	4	19
60-80	0.42	1.05	-0.51	3.16	0.99	0.52
	5	49	-69	22	82	28
80+	-0.04	0.24	-0.29	0.12	-0.14	0.21
	0	11	-39	1	-11	1

Source : Authors' Calculation

The contribution to the life expectancy increments from age groups for Sri Lanka and Kerala are recorded in Table 2. Between the years 1971 and 2000, more than half of the life expectancy increment was contributed by the younger age groups (age at birth to age 15) in both the places, which is evident for both males and females. Nevertheless, the contribution from these ages become minimal to the recent period, 2010-19, which is expected. Recall, it is already discussed that potential gains from these ages were already achieved at their

maximum. For the period 2010 -19, age 15 to age 40 became the main contributors to the life expectancy for Sri Lanka and Kerala, which is contrary to the fact that the greatest potential for mortality reduction remains with the old ages. In other words, the mortality reduction in the older ages (ages 60 to 80, age 80 and above) are not commendable enough to push the overall life expectancy to its highest level. The total increment in life expectancy from these ages is lesser than 25 percent except that for females in Kerala in 2010-19. Recall, such a least contribution from these ages could be the reason behind the sluggish growth in the overall life expectancy at birth in recent years in Sri Lanka and Kerala, which obstructs achieving the epidemiological transition stage, 'age of delayed degenerative diseases', as happened in the developed countries.

Decomposition of Life Expectancy by mortality changes by a group of causes of death

According to the epidemiological transition theory, a major propelling factor to entering the 'age of delayed degenerative diseases' is the reduction of deaths caused by non-communicable/ lifestyle/ degenerative diseases which could be experienced in the old adult and the oldest ages. The experience of many developed countries corroborates this with the achievement of mortality reduction from these diseases and higher contribution from the advanced ages to the increment in life expectancy. The utilization of advanced medical technology in health care as well as preventive and promotive healthcare such as cessation of smoking and alcohol consumption, improvement in lifestyle, etc. were the leading factors that led them to this stage. The total changes in the life expectancy, absolute, and its percentage contributions of years by causes of deaths to total changes in the life expectancies at selected exact ages for Sri Lanka and Kerala are given in Table 3 & Table 4 (see appendix) respectively.

Table 3 records that the life expectancy in Sri Lanka increased by 5.12 years for males and 3.11 years for females between 2000 and 2015. Out of the 5.12 years increment in life expectancy, the major contribution to life expectancy for males is from the 'group of External causes of morbidity and mortality which contributed 2.45 years, while

Table 3
Contribution of mortality changes by causes of deaths to the total increment in life expectancy in 2000 to 2015, Sri Lanka[§]

Age	Total Gain in LE	Certain infectious and parasitic diseases A00-B99	Neoplasms C00-D48	Diseases of the nervous system G00-G98	Diseases of the circulatory system I00-I99	Diseases of the respiratory system J00-J98	Diseases of the digestive system K00-K92	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	External causes of morbidity and mortality V01-Y99	Pregnancy, Childbirth, the Puerperium, Condition in the Perinatal Period, Congenital Malformations etc. §	Others*
Male											
<1	0.56	0.047	-0.002	0.015	0.079	0.037	0.003	0.060	0.022	0.288	0.009
%	100.0	8.3	-0.3	2.7	14.2	6.6	0.5	10.7	4.0	51.7	1.6
1-4	0.08	0.012	0.002	0.000	0.013	0.006	0.001	0.035	0.019	-0.017	0.006
%	100.0	15.8	2.8	0.4	16.3	7.8	1.7	44.9	24.7	-21.8	7.5
5-14	0.15	0.015	0.000	0.003	0.017	0.004	0.006	0.042	0.060	-0.003	0.004
%	100.0	10.2	-0.1	1.7	11.7	2.6	4.1	28.2	40.3	-2.0	3.0
15-44	2.87	0.079	-0.011	0.042	0.149	0.073	0.277	0.234	2.016	-0.011	0.020
%	100.0	2.8	-0.4	1.5	5.2	2.5	9.7	8.2	70.3	-0.4	0.7
45-64	1.28	0.069	-0.069	0.063	0.266	0.132	0.251	0.403	0.268	-0.002	-0.100
%	100.0	5.4	-5.4	4.9	20.8	10.3	19.6	31.5	20.9	-0.2	-7.8
65+	0.19	-0.019	-0.151	-0.012	-0.048	-0.173	0.026	0.842	0.067	-0.002	-0.340
%	100.0	-10.0	-79.9	-6.2	-25.3	-91.5	13.5	444.5	35.3	-0.9	-179.5
Total	5.12	0.204	-0.231	0.111	0.477	0.079	0.563	1.616	2.453	0.253	-0.401
%	100.0	4.0	-4.5	2.2	9.3	1.5	11.0	31.5	47.9	4.9	-7.8

		Female											
		0.52	0.040	-0.002	0.016	0.074	0.037	0.008	0.061	0.019	0.264	0.001	
<1	%	100	7.7	-0.4	3.2	14.2	7.1	1.6	11.8	3.7	50.9	0.3	
1-4	%	0.09	0.017	0.002	0.007	0.012	0.006	0.004	0.036	0.017	-0.012	0.00	
%	100	100	18.3	2.2	7.8	13.8	7.0	4.1	40.2	19.0	-13.1	0.6	
5-14	%	0.15	0.016	0.005	0.004	0.016	0.015	0.006	0.050	0.044	-0.007	0.003	
%	100	100	10.6	3.4	2.4	10.9	9.8	3.7	32.9	29.1	-4.8	2.1	
15-44	%	0.79	0.045	0.000	0.009	0.044	0.055	0.017	0.143	0.473	0.009	-0.001	
%	100	100	5.7	0.0	1.1	5.5	7.0	2.1	18.0	59.6	1.1	-0.1	
45-64	%	0.53	0.011	0.019	0.031	0.152	0.108	0.016	0.274	0.070	-0.001	-0.150	
%	100	100	2.1	3.5	5.8	28.7	20.3	3.0	51.7	13.2	-0.1	-28.3	
65+	%	1.03	-0.029	-0.083	0.000	0.012	-0.132	0.002	1.586	0.037	0.002	-0.363	
%	100	100	-2.8	-8.1	0.0	1.2	-12.8	0.2	153.7	3.6	0.2	-35.2	
Total	%	3.11	0.100	-0.060	0.066	0.311	0.089	0.052	2.149	0.660	0.254	-0.508	
%	100	100	3.2	-1.9	2.1	10.0	2.9	1.7	69.0	21.2	8.2	-16.3	

Note: *Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism, Endocrine, nutritional, and metabolic diseases E00-E88, Mental and behavioural disorders F01-F99, Diseases of the eye and adnexa H00-H57, Diseases of the eye and adnexa H00-H57, Diseases of the skin and subcutaneous tissue I00-L98, Diseases of the musculoskeletal system and connective tissue, Diseases of the genitourinary system N00-N98\$Pregnancy, childbirth and the puerperium O00-O09, Certain condition originating in the perinatal period, Congenital malformations, deformations and chromosomal abnormalitiesSource: Authors' Calculation

Table 4
Contribution of mortality changes by causes of deaths to the total increment in life expectancy in 2000 to 2019, Kerala \$

Cause of Death	Total Gain in LE	Certain Infectious and Parasitic Diseases (A00-B99)	Neoplasms (C00-D48)	Endocrine, Nutritional and Metabolic Diseases (E00-E89)	Diseases of the Circulatory System (I00-I99)	Diseases of the Respiratory System (J00-J98)	Diseases of The Digestive System (K00-K92)	Injury, Poisoning and Certain Other Consequences of External Causes (S00-T98)	Pregnancy, Childbirth, Puerperium, Condition in Perinatal Period, Congenital Malformations, etc.	Others*
Male										
<1	0.24	0.079	0.006	-0.006	0.090	0.095	0.008	0.020	-0.137	0.082
%	100.0	33.3	2.5	-2.7	37.9	40.0	3.4	8.6	-57.7	34.7
1-4	0.11	0.035	0.009	-0.005	0.043	0.030	0.000	0.002	-0.008	0.006
%	100.0	31.7	8.0	-4.7	38.4	26.5	-0.4	2.2	-7.3	5.7
5-14	0.09	0.021	-0.001	-0.007	0.036	0.015	0.012	0.016	-0.013	0.014
%	100.0	22.7	-1.6	-7.1	38.7	16.2	12.5	17.1	-14.1	15.5
15-44	0.49	0.090	0.029	-0.004	0.191	0.040	-0.009	0.192	-0.004	-0.035
%	100.0	18.4	5.9	-0.8	39.0	8.1	-1.8	39.0	-0.8	-7.2
45-64	1.45	0.18	-0.005	-0.134	1.095	0.039	-0.104	0.162	0.009	0.208
%	100.0	12.3	-0.4	-9.3	75.6	2.7	-7.2	11.2	0.6	14.4
65+	0.53	-0.127	0.471	0.591	-0.869	0.565	0.094	-0.059	0.002	-0.142
%	100.0	-24.1	89.4	112.3	-165.0	107.3	17.9	-11.1	0.3	-27.0
1E	2.91	0.198	0.502	0.441	0.496	0.688	-0.007	0.313	-0.014	0.052
%	100.0	6.8	17.3	15.2	17.1	23.7	-0.2	10.8	-0.5	1.8

Female														
<1	0.45	0.088	0.005	-0.001	0.075	0.091	0.003	0.005	0.088	0.094				
%	100.0	19.6	1.2	-0.3	16.8	20.2	0.8	1.2	19.7	21.0				
1-4	-0.06	0.003	-0.022	-0.003	0.012	0.002	0.001	-0.006	-0.017	-0.030				
%	100.0	-5.8	35.7	4.5	-19.8	-3.3	-1.2	10.8	28.5	50.6				
5-14	-0.005	-0.002	0.001	0.000	-0.002	0.000	0.000	-0.001	-0.001	-0.001				
%	100.0	43.2	-14.5	-3.5	31.7	6.5	-1.5	14.1	11.8	12.3				
15-44	0.70	0.119	-0.057	-0.021	0.314	0.036	0.034	0.267	-0.009	0.015				
%	100.0	17.0	-8.2	-3.1	45.1	5.1	4.9	38.3	-1.3	2.1				
45-64	0.40	0.057	-0.085	-0.080	0.353	0.014	0.022	0.045	0.008	0.066				
%	100.0	14.3	-21.4	-20.2	88.3	3.6	5.5	11.3	1.9	16.6				
65+	1.58	-2.225	4.685	10.535^	-13.51^	3.833	0.729	-1.150	-0.028	-1.294				
%	100.0	-141.0	297.0	667.8^	-856.3^	243.0	46.2	-72.9	-1.8	-82.0				
LE	3.06	-1.959	4.527	10.429	-12.75	3.975	0.789	-0.840	0.041	-1.150				
%	100.0	-64.1	148.1	341.1	-417.2	130.0	25.8	-27.5	1.3	-37.6				

Note: \$ Diseases of Blood & Blood Forming Organs & Certain Disorders involving the Immune Mechanism (D50-D89), Mental and Behavioural Disorders (F01-F99), Diseases of the Nervous System (G00-G98), Diseases of the Eye and Adnexa (H00-H59), Diseases of the Ear and Mastoid Process (H60-H95), Diseases of the Skin and Subcutaneous Tissue (L00-L98), Diseases of the Musculoskeletal System and Connective Tissue (M00-M99), Diseases of the Genitourinary System (N00-N99), Symptoms, Signs and Abnormal Clinical and Laboratory Findings N.E.C. (R00-R99)*Pregnancy, Childbirth and the Puerperium (O00-O99), Certain Conditions Originating in the Perinatal Period (P00-P96), Congenital Malformations, Deformations and Chromosomal Abnormalities (Q00-Q99)^ Data quality issueSource: Authors' Calculation

'group of Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified' contributed 2.15 years for female as the highest in their total increment of 3.11 years. But the total contribution from the 'group of neoplasms' was negative for both males and females (-0.23 years and -0.06 years respectively). The total contribution from the 'group of Diseases of the circulatory system' was negligible (0.48 years for males and 0.31 for females). Table 4 indicates the life expectancy in Kerala increased by 2.91 years for males and 3.06 years for females from 2000-to 2019. The biggest contributor to male life expectancy was 'group of Diseases of the Respiratory System' (0.69 years) followed by 'Diseases of the Circulatory System' and 'group of Neoplasms' (0.50 years from each group). The highest contributor to female life expectancy was the 'group of Endocrine, Nutritional and Metabolic Diseases' (10.43 years) followed by 'Neoplasms' (4.53 years). However, the impact of such a positive contribution was neutralized by a stark reduction in life expectancy due to the 'group of Diseases of the Circulatory System' (-12.75 years).

Table 3 also gives the contribution of each group of diseases in exact age intervals for Sri Lanka. It shows that out of the total 5.2 years and 3.11 years of life expectancy increment for males and females respectively between 2000 and 2015, only 0.09 years (males) and 1.03 years (females) were contributed from age 65 years and above. The contributions of all the causes were negligible except that of the 'group of Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified' for this old age population. Further, the contribution to life expectancy increments from many groups of causes of death such as neoplasm and respiratory diseases were negative, indicating an increase in the mortality rates from them among those who were 65 years and above. A similar pattern is also visible in Kerala as depicted in Table 4, where the contribution of the 65 years and above age group to life expectancy is negligible for the period between 2000 and 2019. The contribution from this age group was only 0.53 years and 1.58 years for both males and females respectively to the total life increments of 2.91 years for males and 3.06 for females. Even though it is minuscule, the contribution from the 'group of Diseases of the Respiratory System, 'Endocrine, Nutritional and

Metabolic Diseases' and 'Neoplasms' contributed positively while the 'group of Diseases of the Circulatory System' contributed negatively for males in the age group of 65 years and above. But the contribution from causes of death varies considerably for females in the age group of 65 years and above where the 'group of Endocrine, Nutritional and Metabolic Diseases' contributed positively at a higher level while the contribution of the 'group of Diseases of the Circulatory System' was detrimental.

Concluding Remarks

All through the analysis, this paper focused on exploring the recent developments in changes in life expectancy in Sri Lanka and Kerala. The study evinced that even though life expectancy in these places increased commendably in the previous century, the growth rate was slow in recent years. Such a pre-mature convergence of life expectancy increment is more evident in the male population, widening the gender gap in life expectancy for both Sri Lanka and Kerala. An analysis based on Temporary Life Expectancy (TLE), clearly indicates that younger ages (0 to 15 years, 15 to 40 years) have already achieved almost the maximum level of life expectancy. But the TLE in the older ages, particularly during 60 years and above could not attain the maximum TLE indicating the further possibility for mortality reduction in these ages and their potentiality to contribute to life expectancy increment. But the decomposition of life expectancy increment by age groups indicates that the actual contribution from these ages was very minimal. Furthermore, an inquiry into the impact of causes of death through decomposition analysis upon life expectancy increment revealed that the contributions of many degenerative and non-communicable diseases are substantially low and even some of them made detrimental contributions, especially in the older ages (65 years and above).

Many policies and programmes were introduced in Sri Lanka and Kerala, particularly at the beginning of this century against degenerative/non-communicable diseases and injuries. To control the NCDs, the government of Sri Lanka provides prominence to the strategic leadership in mainstreaming the NCDs in the development agenda. The ministry of health in collaboration with other ministries

and stakeholders formed a Multisectoral Action Plan for the prevention of NCDs with nine important targets to be attained by 2025. Such targets include mortality reduction from cardiovascular diseases, cancer, diabetes, and chronic respiratory diseases; reduction of alcohol consumption and insufficient physical activity, salt/sodium intake, tobacco consumption; scale down the prevalence of raised blood pressure as well as the rise in diabetes and obesity. Besides these, the targets also comprise ensuring the availability of drug therapy and counselling to prevent heart attacks and strokes and also securing affordable basic technology and essential medicines to treat generics (Senaratne & Mendis, 2018).

Kerala also had many programmes that were either sponsored by the central government or state government targeted towards reducing NCDs and Injuries. Such programmes include the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS), National Cancer Control Programme (NCCP), National Tobacco Control Programme (NTCP), National Programme for the Prevention and Management of Burn Injuries (NPPMBI) and National Programme for the Healthcare of the Elderly (NPHCE) (GOI, 2021). These policies and programmes include various aspects of advanced healthcare provision and promotive care by focusing on the adult and aged population. The means of the implementation of such policies and programmes include anti-tobacco and alcohol campaigns, awareness of healthy diet and exercise, prohibition/restriction upon hazardous foods, early detection of NCDs, provision of advanced medical facilities, etc. Furthermore, a myriad of programmes also ensures advanced medical care through financial assistance, health insurance, etc. which not only targets premature deaths from NCDs and injuries but also focuses to protect the population from catastrophic healthcare expenditures.

The low reduction of mortality due to degenerative and non-communicable diseases in older ages and its minuscule contributions to life expectancy increment in Sri Lanka and Kerala is a concerning matter. Both parts of these developing worlds were known for their strength to reduce the deaths and morbidity from infectious and primary healthcare-oriented diseases, particularly through effective

primary healthcare and nutritional programmes. Nevertheless, the above findings of the study reveal that these places could not accomplish the strategic success in controlling the degenerative/non-communicable diseases as well as accidents and injuries as happened in developed countries. It is important to note that most of the developed countries which already could reduce the deaths from these causes are well advanced in medical technology and ensured access to advanced healthcare to its citizens into it apart from the promotive healthcare such as anti-alcohol and tobacco campaigns, awareness for healthy lifestyles and food consumption.

Being the part of developing world, it would not be a viable strategy for Sri Lanka and Kerala to depend on the provision of advanced medical care to the emerging challenges of degenerative/non-communicable diseases, where they do not have enough financial and technological capabilities. Sri Lanka and Kerala need to focus on promotive healthcare and early detection and treatment of these diseases especially for the adult ages to reach the 'age of -delayed degenerative diseases'. Since the responsiveness of degenerative/non-communicable diseases are slow to be visible in mortality reduction, the impact of intervention against these diseases may take some time to reflect in the life expectancy increments even though many policies and programmes particularly the promotive programmes were recently launched in Sri Lanka and Kerala.

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Interrogating the Role of Older Adults in Dispute Resolution in UWELU Community, Southern Nigeria

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ABSTRACT

Older adults in various communities in Africa are seen as vast in wisdom, values, and beliefs of their respective societies such that their pronouncement on issues appears to be binding. Against the incursion of the formal justice system, this study sought to examine the role of older adults in dispute resolution in Uwelu Community, Southern Nigeria. A cross-sectional research design that used questionnaires to gather data from 482 respondents was employed while the social solidarity and social bond theories formed the theoretical basis for the explanation of the topic under investigation. The study found that older adults were not only still involved in the settlement of disputes but they were very efficient and effective. It was suggested that government should develop a clear legal and policy framework that would not make older adults be the first port of call in the settlement of disputes but equally give them monthly stipends.

Keywords: Older adults, Disputes, Justice system, Values, Beliefs
Review of Literature

Older adults the world over are usually seen and regarded as custodians of shared customs, values, and beliefs. Their age

somewhat bestows on them experiences that are vital in the settlement of disputes be it in the family, between families, and even between communities. As Kariuki (2017), rightly observed, older adults provide one of the most relevant dispute resolution institutions in African societies. The point needs to be made here that even with modernity which has tended to reduce the influence of older adults, they have remained resilient and exist outside the sphere of state influence. One of the roles of older adults in the settlement of disputes is mediation between aggrieved persons within the community. The older adults equally adjudicate, negotiate, and carry out reconciliation (Williams, 2000). This they do by bringing the parties to sit down together although informally, and in the end, the dispute is resolved and social harmony and social bonds are restored.

Rautenbach (2014) has noted that despite the incursion of modernity in the way and manner in which older adults handle and resolves disputes in African societies, it has remained resilient and unwavering. The implication of this is that older adults have and still settle disputes as per the shared values and customs of the people. Perhaps a major reason for the continued existence of their role in dispute resolution to date is that the formal justice system is rather complex, technical, time consuming, and involves huge cost (Obarisiagbon and Aderinto, 2019). Little wonder people still troop to the older adults who are Enogie, Odionwere, or even head of a family to resolve their disputes.

Although one cannot overrule or undermine the fact that justice, as dispensed by older adults, has its hiccups, the truth be told, it remains the most effective means of settling disputes while maintaining social harmony and bonds in the society. This perhaps explains why even the formal justice system has started looking at the older adults' method of dispute resolution by establishing multi-door courts in the various states of the federation of Nigeria. The point has been made by Olawale (2020), that no one can take the shine off older adults in terms of the way they settle disputes in Nigeria. He further stated that because people believe in their impartiality, and wisdom and as holders of the people's values, they tend almost always to accept the outcome of their settlement.

In every society, irrespective of the level of social bonding, conflicts are inevitable as a result of human differences in ideas, interests, and aspirations. Thus, dispute resolution has always been part of human society (Kariuki, 2017; Muluken, 2020). Before the advent of the colonial masters, societies in Africa had institutional means of resolving conflicts and maintaining peaceful coexistence (Ademowo, 2015; Onyima, 2015). This method was effective then because it portrays the socio-cultural orientation of the African people (Ajayi & Buhari, (2014); Onyima, 2015; Kariuki, 2017). Although its mode of operation may differ from one society to another, the African traditional dispute resolution system whose major aim is to restore peace and social order has certain standards that are common to all societies; it is established on the society's conventional normative beliefs and practices are understood by every indigene of that society. There is a high regard for the community heads and elders because of the symbolic authority they represent, and the various deities in these societies are highly reverend (Adeyinka & Lateef, 2014; Muluken, 2020).

Traditionally, the African governmental system is democratic and participatory, hence, family identity was of great essence as the role of each family head and older adults were emphasized in preventing, managing, and resolving disputes (Ademowo, 2015; Waindim, 2019). Indigenous dispute management council members could be male-dominated, proportionally mixed, or exclusively for the men folks, depending on the community. Decisions were usually taken unanimously at older adults' gatherings with verdicts reached, binding on all (Ademowo, 2015). The majority of the disputes then were hinged on boundary/land ownership brawls, abuse, integrity, incest, spousal fall-outs, witchcraft, and sometimes murder. Also, these disputes may be interpersonal or inter-communal. Justice and equity which are richly embedded in African customs and practices were maintained in resolving these disputes (Waindim, 2019; Omotayo, 2021).

With this method of dispute resolution, justice was easily accessible and convenient for the indigent and uneducated rural dwellers as it, promotes positive bonds, offers and advanced restorative justice, and offers some degree of autonomy to the parties

in the process, unlike what is obtainable in today's formal court system where aggrieved parties are taken through rigorous protocols in courts located in the urban centers (Kariuki, 2017). However, these native institutions became greatly diminished with the advent of colonization even to the extent of being nonexistent in some societies. The colonial masters initiated the English law court which invariably meant that disputes that were formally settled traditionally were now handled by the police and native courts with the judgment passed instead of conflict resolved amicably.

Traditional institutions and dispute resolution

Before colonization, traditional rulers who were usually older adults in Africa were able to resolve disputes both within and outside their communities amicably and restrain and curtail the anti-social behavior of deviants within their communities (Kariuki, 2015). The roles of traditional councils usually made up of older adults in pre-colonial African societies cannot be over-emphasized as they were very significant in the mediation, reconciliation, and resolution of disputes. In traditional African societies, deviancy was collectively frowned at, thus, an offense against collective consciousness and the gods of the land. How these disputes were resolved and social sanctions carried out may differ from community to community but, the basic goal was the maintenance of peaceful coexistence, justice, and sanctions for deviant behavior (Muluken, 2020). In traditional African societies, dispute resolution was carried out by older adults which being binding on all, nurtures communal bonds, and was cost-effective (Kariuki, 2015; Waindim, 2019). Traditional dispute resolution methods are more suitable than formal litigations as this method allows individuals in their various communities to seek redress and settle disputes amicably according to the dictate of their customs and traditions (Kariuki, 2015).

Dispute resolution the traditional way does not require a complex and fund-consuming structure, and amicable resolutions are usually achieved within a short time frame as against the endless long lineup of formal court cases. For Ajayi & Buhari (2014), indigenous dispute resolution is very valuable as it saves time, helps in the reduction of congestion in formal legal proceedings, is cost-

effective, solves the issues of manpower shortage, and more importantly, affords low-income earners and those not comfortable with formal structures of injunction affordable and suitable means of resolving disputes.

Traditional African societies annually engage in festive celebrations where cultural values are portrayed in dances and dramas with sacrifices rendered to their forefathers in furtherance of peaceful coexistence. Oral literature has it that these deities have the capacity to inflict all manner of wrath on offenders. The Indigenous dispute management method being participatory and democratic allows the individual family head to participate in the resolution of disputes concerning their family members and thus, is seen as non-biased in its approach.

Despite its advantages for both the individual members and the society at large, indigenous dispute resolution is devoid of formal injunction, filing of motions and counter motions, insufficient monetary backing from the state coupled with its limited ability for the negligence of structural achievement can place at risk the cogency of the process to pave more way to rectitude for the society. Traditional African judicial procedure is seen as inadequately low concerning formal judicial processes because of its domination which is the normative setting surrounding its beliefs and values attached to traditional dispute resolution. The objectionable passages intended for constraining the usage of African customary law are still part of the penal code of the majority of African nations even after independence (Kariuki, 2017).

Elderly roles in dispute resolution in Uwelu community

Uwelu Community which is one of the eight villages that make up Egor Local Government Area of Edo State, Southern Nigeria, is situated in the Eastern part of the local government, with a population size of about 42,487 (Nigerian Population Commission, 2006). Uwelu Community consists of 56 streets which are combined into 2 political wards and is made up of mainly the Bini-speaking people of Edo State who are Christians and traditional worshippers. The Enogie (Duke) is the traditional leader of the community and is referred to as the "Enogie of Uwelu" (The Duke of Uwelu). There is also the Odionwere who is the oldest adult male and politically, second to the Enogie.

The Enogie's cabinet is made up of other adults or elders formerly referred to as the "Edions". The Enogie and the Edions of Uwelu Community together formed the community's traditional government which is endowed with advisory, judicial and ritual functions and decisions taken by them are not liable to appeal. In Uwelu community, elders' council membership is exclusively reserved for the male members of the community. The Enogie is regarded as an incarnation of the beliefs, hopes, fears, and aspirations of his people, and hence, the hub between the indigenes and their forefathers. Oral literature has it that in Uwelu community, indigenes peacefully coexist, have collective bonding, regard for one another, and willingly accept and pardon each other in resolving disputes, about what is obtainable in today's formal judicial structure where judgment is passed instead of conflict resolved amicably.

Historically, African societies have traditional courts which in Uwelu community are referred to as "Ogue Edion" this is where the elder's council sits to resolve disputes. Sometimes, this can be done at the community or village square depending on the nature of the dispute. Also, penalties can be inflicted on families of an individual who do not conform to societal traditions as these cultural practices are expected to have been transmitted to children in the course of socializing them from infancy by their respective families. Thus, Socialization is an essential component of dispute resolution in traditional African society; children are brought up to have great regard for older adults and the cultural practices of their communities. Additionally, to imbibe this cultural practice, especially in ascertaining quilt, truth and to prevent dishonest and evil attitudes, oath-taking was commonly used to resolve disputes in Uwelu Community and this was usually done at the "Ogue Edion".

We must be quick to add here that the Odionwere equally plays a vital role in the settlement of disputes as his court is that of the first instance. He and the community's older adults settle disputes although those dissatisfied can plead their case before the Enogie

Although the indigenes of Uwelu community have not lost their capacity to co-exist peacefully and commune together, the presence

of the Christianity and subsequent modernization has eroded most of the significance of the royal court of the Enogie of Uwelu, as some indigenes now seek redress outside the community in a formal court. It is worth mentioning that the community older adults in conjunction with the Enogie still play the role of the village court where minor civil and criminal cases are looked into and resolved.

Statement of problem

For ages past, the settlement of any dispute no matter how insignificant has always rested on the shoulders and doorsteps of older adults in Nigeria. The older adults who were often regarded as full of wisdom dispensed justice according to the customs and values of their respective societies. People sought their opinion in virtually all matters of life. Although, there were occasions when some women felt that male older adults were biased against women and that this was reflected in their decisions. Besides this, access to older adults concerning dispute resolution was very easy and not costly as they could be approached at any time of the day.

There has however been the contention that older adults do not have any major role to play in the settlement of a dispute in modern-day Nigeria. Their contention is based on the fact that Nigeria has a justice system tailored along to the western model and as such the older adults do not have any place in the settlement of disputes. Contrary to this view, other scholars have canvassed the position that older adults still have a prominent role to play in the dispensation of justice as they remain a key factor in dispute resolution (Olawale, 2020).

Bello (2014); Oluduro (2017) & Ezejiofor, (2018) were very emphatic when they stated that despite the incursion of modernity into Nigeria's legal system, the older adults have remained relevant in ensuring that disputes are settled following the custom and traditions of the people. The question is how effective is the involvement of older adults in the settlement of disputes in Nigeria? It would appear that the continued existence of district and customary courts and the way people still troop the palace of the Enogie, and elders' council in various communities are pointers to the fact that they might still be effective and relevant.

The study was therefore necessitated by the desire of these authors to find out whether, in the face of the incursion of modernity in Nigeria's legal system, the older adults still play any role in dispute settlement and how effective this role is now.

Research Questions

The following questions were formulated in the course of this study and helped to guide it-

1. Are older adults involved in resolving disputes in Uwelu Community, Southern Nigeria?
2. How effective is the involvement of older adults in resolving disputes in Uwelu Community, Southern Nigeria?

Objectives of study

The main objective of the study is to examine the role of older adults in dispute resolution in Uwelu Community, Southern Nigeria. Specifically, the study seeks to:

1. find out if the older adults are involved in the resolution of disputes in Uwelu Community, Southern Nigeria
2. examine the effectiveness of the involvement of older adults in the resolution of disputes in Uwelu Community, Southern Nigeria

Methods and materials

This study adopted a one-time study design because it is useful in the collection of data that tends to objectively describe an existing social phenomenon, in this case, older adults' role in the settlement of disputes. The sample size of this study was 500 and comprised of the Odionwere, members of Uwelu Community elder's council, members of Uwelu customary court, and all older adults in the community. The Community was stratified into five strata and the purposive sampling technique was used to administer 95 questionnaires each to households in the various strata that have older adults, while 22 questionnaires were administered to members of the council of elders of Uwelu Community, Southern Nigeria, and 3 for the president and members of Uwelu customary court.

A self-designed questionnaire titled "older adults and disputes resolution" (OADRQ) was used to gather data from respondents in Uwelu community. The questionnaire was divided into two sections, A and B respectively. Section A dealt with the socio-demographic variables of the respondents while section B looked at the role of older adults in dispute resolution. Two research assistants who were recruited and trained assisted in the administration of the research instrument on the respondents. The research instrument was face validated while its reliability was determined based on the result of the pilot study carried out. Out of the 500 hundred questionnaires that were administered to the respondents, 482 were retrieved and found valid. This was thereafter used in the analyses of the data which involved frequency distribution and simple statistics.

Table 1
Demographic Characteristics of Respondents

	<i>FREQUENCY</i>	<i>PERCENTAGE (%)</i>
Sex		
Male	350	73
Female	132	27
Total	482	100
Age		
50-59	3	0.62
60-69	350	72
70-79	100	21
80 and above	29	6
Total	482	100
Religion		
Christianity	352	73
Islam	30	6
A.T.R.	100	21
Total	482	100

Educational status		
Primary	132	27
Secondary	250	52
Tertiary	100	21
Total	482	100
Marital status		
Married	402	83
Single	-	-
Divorced	50	10
Separated	30	7
Total	482	100

Source: Field survey, February- April 2022

Table 1 indicates that there were 350 (73%) male respondents while the number of female respondents was 132 (27%). This implies that there were more male respondents than females in the area of study. It also shows that respondents between the ages of 50-59 years were 3 (0.62%), those between 60-69 years were 350 (72%), while those within the ages of 70-79 years were 100 (21%), and those who were 80 years and above were 29 (6%). This shows that majority of the respondents were between the ages of 60-69 years. On religion, 352 (73%) of the respondents were Christians, 30 (6%) were Muslims and 100 (21%) practiced African traditional religion. On educational status, 132 (27%) of the respondents had primary education, 250 (52%) had secondary education and 100 (21%) had tertiary education. This shows that the majority of the respondents had secondary education. For marital status, 402 (83%) of the respondents were married, there were no single respondents, 50 (10%) were divorced and 30 (7%) were separated. This means that majority of the respondents were married.

Research question one

Are older adults involved in resolving disputes in Uwelu Community, Southern Nigeria.?

Table 2

Percentage score of involvement of older adults involved in the resolution of a dispute

<i>Are older adults involved in the resolution of disputes?</i>	<i>FREQUENCY</i>	<i>PERCENTAGE (%)</i>
Yes	450	93
No	32	7
Total	482	100

Source: Field survey, February- April 2022

Table 2 shows that 93 per cent of the surveyed population affirmed that older adults are involved in the resolution of disputes, while 7% stated that older adults are not involved in the resolution of disputes. This study's findings have, to a large extent, further validated the study of Rautenbach (2019) which found that despite the incursion of modernity into African's justice system, older adults still handle and resolve a dispute in African societies he stated that their involvement has remained resilient and unwavering. The implication of this is that older adults have and still settle disputes following the shared values and customs of the people.

Research Question 2

How effective is the involvement of older adults in resolving disputes in Uwelu Community, Southern Nigeria.?

Table 3

Percentage Score of older adults in the resolution of disputes

<i>Is the involvement of older adults in the resolution of disputes effective?</i>	<i>FREQUENCY</i>	<i>PERCENTAGE (%)</i>
Yes	300	62
No	182	38
Total	482	100

Source: Field survey, February- April 2022

Table 3 shows that 62 per cent of the surveyed population affirmed that the involvement of older adults in the resolution of disputes is effective, while 38 per cent held that the involvement of older adults in the resolution of disputes is not effective. This study's findings have, to a large extent, further validated Olawale (2020) who stated

that the truth be told, older adults' involvement in the dispensation of justice, remains the most effective means of settling disputes while maintaining social harmony and social bonds in the society. This perhaps explains why even the formal justice system has started looking at this method of dispute resolution by bringing multi-door courts in the various states of the federation of Nigeria. Olawale (2020) and Kariuki (2015) further pointed out that, no one can take the shine off older adults in terms of the way they settle disputes in Nigeria.

Conclusion and Recommendations

It is a truism that in all known human societies, disputes are bound to occur from time to time and that a mechanism also exists to settle such disputes. In Nigeria, older adults play a pivotal role in the settlement of disputes between individuals in a family, amongst different families, and even intra-communal as the case may be. Although the methods they adopt do vary, the central goal has always been and still is social cohesion. Despite the advent of the English common law, the people of Uwelu Community, Southern Nigeria, still hold their older adults in high esteem concerning the settlement of their disputes. Based on the findings of this study, the following recommendation has been put forward;

1. The chief judge who is the head of Edo State judiciary, where Uwelu Community is situated should give a practice direction that will provide a clear legal framework for the application of older adults in the settlement of disputes.
2. The Enogies and Odionweres in the various communities who as older adults settle disputes either in the "Ogue Edion" or their palaces should be placed on a monthly stipend by the government. This will not only act as a morale booster but discourage corruption.
3. The justice system should ensure that older adults act as the first port of call in certain matters. These should be spelt out in the gazette as it will reduce the overloaded court list.
4. Lastly, there should be a codified means of enforcement of the outcomes of the settlements made by older adults such that parties are bound to them unless appealed against.

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