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NEWS & VIEWS

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The Members of Editorial Board of Indian Journal of Gerontology welcome Dr. Sanjay Kumar, Associate Professor, Department of Psychology, Central University of Punjab, Bhattinda-151001, as a member of the Editorial Board (Social Sciences).

New Life Member - L629, Ms. Punyarupa Bhadury Assistant Professor, Department of Sociology, Barsat College 1, Kalyani Road, Barsat-700126 (WB).

Restoration of Occlusion in a 68 Years Old Patient with Lost Vertical Dimension: A Case Report

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ABSTRACT

Tooth wear in the elderly population is a commonly reported dental complaint these days owing to the changes in eating habits and lifestyle. It is a multifactorial issue and yet all the etiology is not known to the clinicians. The clinicians need to carry out a comprehensive examination, eliminate the reason for tooth structure loss and plan the treatment for the patient accordingly. The present case report describes the treatment plan of a 68 years old female patient with lost vertical dimension and masticatory functions which were restored with the help of an occlusal overlay splint for a month to rule out any discomfort in adaptation to the new vertical dimension. A provisionalisation for 3 months was done and during this period the required root canal therapy was performed. The final prosthesis was delivered with the restored esthetics and function and 6 months recall was done.

Keywords: Ageing, Centric Relation, Rehabilitation, Tooth Wear, Vertical Dimensions

Tooth wear is a normal physiological process that occurs at a very slow rate naturally with ageing. Certain cases have reported a combination of various factors to produce the tooth wear at a faster rate resulting in compromised occlusion as well as function along with the inappropriate appearance due to loss in the vertical dimension. These factors may include attrition, erosion, abrasion, and habits like bruxism, clenching, stress, etc., (Turner, and Missirlian, 1984; Smith, 1989). Management of a worn dentition using a fixed prosthesis is a complex process and needs proper evaluation of the vertical dimension, interocclusal space, and centric relation. A comprehensive customized treatment is planned for an individual depending on the information obtained from the patient's examination in combination with the patient's expectations. The adaptability of the patient to the treatment is confirmed by clinical examination during the period of occlusal splint therapy and provisionalisation. The required changes are made until the patient shows no signs and symptoms concerning the whole stomatognathic apparatus (Hemmings, *et al.*, 1995). The recall is important to ensure the long-term stability of the treatment. The restoration of the vertical dimension should be a stepwise and conservative approach to ensure long-term stability in the results. It is essential to evaluate the amount as well as the cause of the loss of the vertical dimension by the worn dentition. Careful and strategic planning is a must for adaptation to an altered vertical dimension as an unplanned alteration of vertical dimension in a bruxism patient may destroy the final restorations owing to the extra load produced on the teeth (Prasad, S., *et al.*, 2008; Ghalaut, *et al.*, 2019; Jahangiri, and Jang, 2002). The restoration of a severe attrition case where the space available is insufficient involves the use of an overlay splint (Windchy, and Morris, 1998; Sato S, *et al.*, 2000; Jahangiri, and Jang, 2002) or adhesive resin (Darbar, and Hemmings 1997; Hemmings, *et al.*, 2000). This treatment modality is based on the report of Dahl, *et al.*, in 1975, where he used a removable anterior device made of cobalt-chromium in an 18-year-old patient with advanced local attrition (Ibid). This plate produced stable vertical relations resulting from the intrusion and eruption of the anterior and posterior teeth respectively (Dahl and Krogstad 1985; Dahl, BL., 1995).

CASE REPORT

A 68-year-old patient presented in our dental clinic with the main complaint of pain and sensitivity and inability to eat due to severe attrition. The patient wanted functional as well as esthetic

restoration. The patient had a history of night grinding noticed 3 years back. The patient also presented a history of endodontic and Prosthodontics treatment done 5 years back.



Figure 1 : Pre-Operative Picture of Occlusion

A detailed examination was conducted to assess the reason for this severe attrition. The TMJ and jaw opening was found to be normal and stable without clicking or any signs or symptoms. Joint loading of Centric Relation using the bimanual technique was carried out and no tension and tenderness with the musculature was recorded. The patient exhibited wrinkles and drooping of commissures indicating loss of vertical dimension. Intraoral examination revealed severe loss of tooth structure in relation to teeth number 18, 17, 16, 15, 14, 23, 24, 25, 26, 28, 33, 34, 35, 36, 37, 38, 43, 44, 45, 46, 47, 48. Pulp testing results were positive for reversible pulpitis concerning the above-mentioned teeth. Unaesthetic chipped porcelain-metal crowns (incisally as well as palatally) were seen with teeth number 11, 12, 13, 21, 22, 3, 32, 41, 42. The patient's gingiva exhibited recession with lower incisors and mild inflammation with upper anterior teeth and had missing tooth 27.

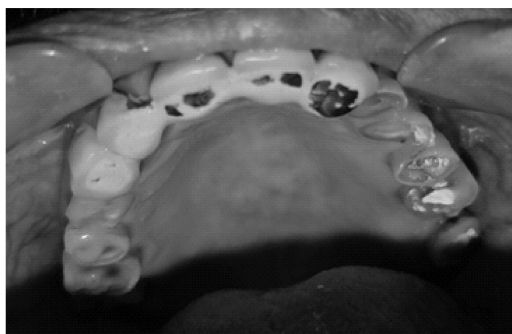


Figure 2 : Unaesthetic chipped porcelain-metal crowns

The vertical dimension was assessed clinically and then, the physiologic rest position was determined by the facial measurements and confirmed with the help of phonetics. The interocclusal rest space was found to be 5-6 mm which was greater than the normal value of 2-4 mm confirming the loss of vertical dimension.

Treatment

The treatment planning included full mouth rehabilitation using porcelain metal crowns following root canal treatment with the existing teeth to restore the esthetics, function, and patient's expectations. The conservative adhesive treatment plan was not acceptable to the treatment keeping her habits into consideration. Intentional root canal treatment was planned as the result for pulp testing was positive and the pulp chamber was nearly exposed for most of the teeth. A Crown lengthening procedure was not required in her case due to the sufficient tooth structure being available. She also did not want to undergo surgery for an implant concerning the missing tooth number 27, so a bridge was planned. A night guard was suggested as well to protect the restored dentition from any recurring damage.

Impressions were taken with alginate (Zelgan 2000, Dentsply, Manesar, Gurgaon, Haryana, India) to prepare a study and diagnostic casts (Kaladent, TR, Mumbai, Maharashtra, India) which were then transferred to a semi-adjustable articulator (Hanau™ Modular articulator, Whipmix Corp., Louisville, USA) using face bow transfer records. Following the mounting of study casts, it was evident that the vertical dimensions had collapsed and needed to be restored. The new vertical dimension was established by a 5 mm increase in the incisal guidance pin of the articulator. The final increase was 3 mm in the anterior teeth and 1-2mm in the posterior teeth.

A quadrant wise full mouth manual oral prophylaxis was carried out in 4 sittings. A splint was fabricated using self-cure acrylic resin (DPI RR Cold Cure, India) to offer bilateral contact between the posterior teeth in centric relation and restore the lost anterior guidance. The patient was instructed to wear the splint for 18-20 hours a day (except when eating or sleeping) for 6-8-week

time. The patient recall was scheduled every alternate week, the patient reported no signs and symptoms with the altered vertical dimension in the first week. It is very essential to assess the adaptability of the patient to the new vertical dimension before proceeding to ensure a stable treatment. The diagnostic wax-up was done following the occlusal overlay splint therapy. The provisional crowns were fabricated using heat polymerizes hard acrylic resin (DPI Heat Cure, India) and cemented using the temporary cement (Zinc F+, Prevest Denpro, India). The provisional restorations which were serving as a guide to our final or definitive restorations were adjusted over 3 months. During this period the muscle tenderness, temporomandibular discomfort, mastication, speech, swallowing, esthetics, and range of mandibular movements were evaluated biweekly and the patient was informed about the endodontic phase that was following. The root canal treatment was carried out quadrant-wise over two weeks. During the treatment, tooth 42 was found to be vertically fractured. The patient was informed about the need for extraction of the tooth and replacement of the same by a bridge. With the patient's consent, atraumatic extraction was carried out.



Figure 3: Provisional Crowns

Once the patient was satisfied with the improved esthetics and function, the anterior guidance and posterior disclusion were established and transferred to the customized anterior guide table made using acrylic resin (Pattern Resin LS, GC America, ALSIP, IL,

USA). The final tooth preparation was performed, and the impressions were recorded using 2 step impression technique with Putty and light body impression material (Zeta plus, Zhermack, Badia, Polesine, Rovigo, Italy). Bite registration was done using provisional crowns of opposing quadrants and bite registration wax (Bite registration Wax, Shiva products, Palghar, India) with the prepared teeth.



Figure 4: Metal Trial

The metal framework was casted using base metal alloy followed by a trial intraorally. The required adjustments were made related to the fitting of the framework.



Figure 5: Unglazed Trial

The porcelain build-up was carried out and another intraoral trial was done. This time minor adjustments were needed related to the lingual surface of the anterior teeth.

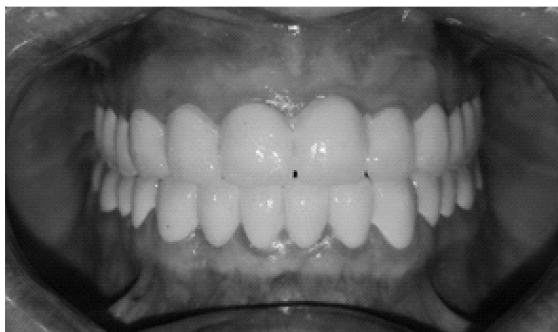


Figure 6: Final Prosthesis with the restoration of occlusion

The Final Prosthesis was cemented the next day using luting cement (GC I, GC Corporation, Tokyo, Japan). Oral hygiene maintenance and instructions for wearing a nightguard were given, and a review was carried out after a week. The patient was happy and satisfied with the esthetic and functional outcome of the treatment. A one-year recall was scheduled on the next visit of the patient to evaluate the long-term prognosis of the treatment.

Discussion

Aggressive or rapid tooth wear results in the loss of vertical dimension in an individual but the increase in the vertical dimension cannot be random and needs to be restored to its previously existing value. The unclear guidelines suggest the most conservative adhesive treatment strategy which has an additional advantage of being a reversible process too (Darbar, and Hemmings, 1997; Hemmings, *et al.*, 2000; Johansson, *et al.*, 2008). In the absence of enough tooth structure to hold the restorations, a conventional treatment is planned. In some cases, space for the restoration needs to be created first as the supra-eruption of the teeth and alveolar bone often compensates for any loss in the vertical dimension. The previous literature reports that the duration of splint therapy ranges from 3 weeks to 5 months depending on the severity of the case. The intensive fixed provisional prosthesis needs to be observed for a period of 2-6 months (Brown, 1980; Turner, and Missirlian, 1984; Hemmings, *et al.*, 2000; Sato, S., *et al.*; 2000; Jahangiri, and Jang, 2002).

In the following case, the treatment includes an occlusal overlay splint for 6-8 weeks. Following the diagnostic wax-up, the tooth preparation and temporary cementation of the provisional restorations were done. The adaptation to the new vertical dimension took 3 months. The definitive prosthesis is planned after the TMJ is adapted to the new bite without any signs or symptoms. The patient is then recalled for review after a week and long-term recalls are scheduled after a year to ensure its long-term stability.

Conclusion

The patient was happy and highly satisfied with the esthetic and functional outcome of the treatment. She appreciated the facial changes which appeared after treatment completion. Advanced aged patients also have esthetic expectations along with functional requirements during full mouth rehabilitation. Stepwise full mouth rehabilitation is a long and complex process. It focuses on the improvement of the esthetics and function of the existing dentition maintaining a stable stomatognathic system. The alteration in the vertical dimension needs a considerate approach and cannot be done arbitrarily; hence the response of the stomatognathic system to the new vertical dimension is suggestive of the prognosis of the treatment planned. The anterior guidance and posterior disclusion are important factors in case of a severely worn dentition as they too affect the prognosis of the treatment.

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Prevalence of Anaemia and Its Association with Metabolic Syndrome and Its Components among Rural Elderly Women of Amdanga block, North 24th PGS West Bengal

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ABSTRACT

The purpose of this study was to find out the prevalence of anaemia and its association with metabolic syndrome (MS) and its different components among rural elderly women of Amdanga block, North 24th PGS West Bengal. 236 rural elderly women were selected randomly from 30 villages of Amdanga block, West Bengal. Haemoglobin (Hb), Fasting Blood Glucose (FBG), serum Triglycerides (TG), High-Density Lipoprotein-Cholesterol (HDL-C), Blood Pressure (BP), and Waist Circumference (WC) were measured. Metabolic Syndrome (MS) was defined as per International Diabetes Federation (IDF), 2005 (for Asian-Indians) criteria. Statistical tests were calculated using SPSS software version 20.0. A p-value <0.05 was considered statistically significant. The findings revealed that 61.86 per cent of elderly women were anaemic. Further mild,

moderate and severe anaemia among them was observed to be 36.98 per cent, 42.46 per cent & 20.54 per cent. The prevalence of anaemia among MS consisting women was 54 per cent.. Among the women having WC $\geq$ 80 cm, FBG $\geq$ 100 mg/dl, TG $\geq$ 150 mg/dl, HDL-C $<$ 50 mg/dl, and BP $\geq$ 130/85 mm of Hg were 62.39 per cent, 57.15 per cent, 60.87 per cent, 57.9 per cent, 57.9 per cent respectively anaemic. A significant statistical association was found between HDL-C ($p < 0.05$) and blood Hb status using the Chi-square test. Based on present findings it may be concluded that the high prevalence of anaemia existed among rural elderly women of Amdanga Block, 24th Parganas, West Bengal. A significant statistical association was found between HDL-C ($p < 0.05$) and blood Hb status, indicating a possible coexistence of anaemia and some of the MS risks.

Keywords: Elderly women, Blood glucose, Haemoglobin, Hypertension, MS, Waist circumference

In the global scenario, elderly women constitute around 11 percent of the total population (United Nations Department of Economic and Social Affairs/Population Division, 2009). This particular population is likely to triple by 2050 and primarily this expansion is taking place in under-developed /developing countries. In India, the elderly represent 8.14 percent of the total population; where women outnumber men and this imbalance increased with age (National Program for Health Care of Elderly, 2011). Worldwide there were 123 women for every 100 men aged 60 and above (WHO, 2006). Again in consideration of the demographic, cultural, and income differences between males and females, ageing becomes more challenging for women than men (Singh, T., *et al.*, 2018). Most elderly women encounter poor nutrition, reproductive ill-health, violence, and life-style related diseases (Ibid). All these conditions exacerbate the postmenopausal phenomenon and increase the prospect of ailment and disorder including anaemia, MS, and CVDs (Singh, T., *et al.*, 2018; Srimani, S., *et al.*, 2018). Anaemia is one of the major public health problems in India, especially affecting women across all age groups. Unfortunately, in India, much emphasis has been laid on anaemia

in children and women of reproductive age group in comparison to the elderly (Onem, Y., *et al.*, 2010). Thus, anaemia in the elderly is yet under-recognized (Onem, Y., *et al.*, 2010; Singh, T., *et al.*, 2018; Srimani, S., *et al.*, 2018). On the other hand, the risk of MS increases with menopause and may partially determine the apparent hastening in CVD after menopause (Srimani, S., *et al.*, 2018; Onem, Y., *et al.*, 2010). Anaemia is often found with the presence of CVD risks including MS, though the pathophysiological theory is mostly unclear (Onem, Y., *et al.*, 2010; Singh, T., *et al.*, 2018; Srimani, S., *et al.*, 2018). Very few reports are available on the relation and occurrence of anaemia with MS and different CVD risks (Onem, Y., *et al.*, 2010; Singh, T., *et al.*, 2018; Srimani, S., *et al.*, 2018; New, J.P., *et al.*, 2008; Singh, A.K., *et al.*, 2010; Mehedi, and Toto, 2009). The objective of the study was to determine the prevalence of anaemia and its association with metabolic syndrome (MS) and its different components among rural elderly women of Amdanga block, 24th PGS West Bengal, India.

Materials & Methods

Study Design

This cross-sectional study was conducted among non-institutionalized rural elderly women (≥ 60 years), selected randomly from 80 villages of Amdanga block, 24th Parganas North, West Bengal, India from April 2014 to August 2018 following multistage sampling method.

Sample Size and Sampling Method

The sample size was calculated by taking the previous prevalence of anaemia as 91.3 per cent (Kaur, and Kochar, 2009), and using formula $n = [Z_{(1-\alpha/2)}]^2 pq / L^2$; where L is an allowable error, which was taken as 5 per cent of p, and $Z_{(1-\alpha/2)}$ is the standard normal deviate at 95 per cent confidence limit, which comes to be 1.96. Calculated sample size was 147. Considering discontinuation by the selected individuals for any reason, the target population is increased by 10 per cent. Hence, it came out to be 162. However, based upon logistics, feasibility, and minimum calculated sample size, we covered

236 subjects. WHO-30 cluster sampling was followed. At the first stage, 30 villages were selected randomly from the Amdanga block area, North 24th Parganas, West Bengal. In the second stage, by following a systematic random sampling method, 236 elderly women were selected from the selected villages.

Exclusion Criteria

Women having a history of thyroid dysfunction, on hormonal replacement therapy, amenorrhea due to any pathological cause or surgery, on iron-folifer supplementation, physically or mentally challenged and non-cooperative were excluded from the study.

Diagnostic tools used

Hb level was measured by the cyanomethaemoglobin method (Dallman PR.,1984). Non anaemia, mild anaemia, moderate anaemia and severe anaemia were defined as ≥ 12 gm/dL, 11-11.9 gm/dL, 8-10.9 gm/dL, and < 8 gm/dL of Hb concentration of blood (WHO, 2001) BP, WC, FBG, serum TG, and HDL-C were measured using a standard procedure (Trinder, P.,1969; Herbert, K.,L.,1984; Lohman, TG.,*et al.*,1988; Meerjady SF *et al.*, 2009). Overnight fasting (10-12 hours) blood specimens were collected early in the morning from the villages for all biochemical estimations. MS was defined as per IDF, 2005 (for Asian-Indians) criteria (Alberti, G., *et al.*,2006). The present study is a part of the original research work, already published (Ghosh, J. *et al.*,2020).

Statistical Analysis

Data were put in a Microsoft Excel worksheet (Microsoft, Redwoods, WA,USA) and checked for accuracy. Association between two attributes was calculated by Pearson's Chi square test. Continuous data were first checked for normality distribution by Kolmogorov–the Smirnov test. Significant *P*-value indicated skewed distribution. Thus, continuous data were presented in the median and interquartile range. Because of skewed distribution, nonparametric tests were performed. The difference between distributions of two continuous variables was determined by Mann–Whitney *U*-test (*Z* value). A correlation was calculated by Spearman's

correlation coefficient (ρ). SPSS software, version 20.0 (Statistical Package for the Social Sciences Inc, Chicago, IL, USA) was used for calculation. $P < 0.05$ was considered statistically significant.

Ethical clearance

Ethical clearance was obtained from the Ethics Committee of AIHH & PH, Kolkata, India, and informed written consent was obtained prior to the study.

Results

Prevalence of anaemia ($Hb < 12 \text{ gm/dL}$) among the elderly women ($n=236$) was 61.86 per cent. Further mild, moderate and severe anaemia among them was observed to be 36.98 per cent, 42.46 per cent & 20.54 per cent. Median Hb concentration was 10.87 gm/dL and inter-quartile range (IQR) was Q1-Q3 (9.15-12.96). The prevalence of anaemia among women having MS was 54 per cent. Prevalence of anaemia among the women having WC $\geq 80 \text{ cm}$, FBG $\geq 100 \text{ mg/dL}$, TG $\geq 150 \text{ mg/dL}$, HDL-C $< 50 \text{ mg/dL}$, and BP $\geq 130/85 \text{ mm of Hg}$ were 62.39 per cent, 57.15 per cent, 60.87 per cent, 57.9 per cent, 57.9 per cent, respectively (Table 1). A significant statistical association was found between HDL-C ($p < 0.05$) and blood Hb status using the Chi-square test.

Table 1

Distribution of elderly women according to blood Hb level in relation to metabolic syndrome, waist circumference, fasting blood glucose, triglyceride, HDL cholesterol, and blood pressure ($N=236$):

Parameter	Hb level				Total	Chi-square test (p-value)
	Hb<8 (%)	Hb 8-10.9(%)	Hb 12-10.9(%)	Hb ≥12 (%)		
Metabolic Syndrome present (IDF)						4.781(p=0.189)
Yes	9(10.84)	16(19.27)	20(24.09)	38(45.78)	83(100)	
No	21(13.63)	46(29.87)	34(22.07)	52(33.76)	153(100)	
Waist Circumference						0.801(p=0.849)
<80 cm	12(9.44)	33(25.98)	27(22.04)	49(38.58)	127(100)	
≥80cm	18(16.51)	29(26.60)	27(23.85)	41(37.61)	109(100)	
Fasting blood glucose						1.116(p=0.761)
<100mg/dl	26(12.5)	57(27.4)	47(22.59)	78(37.5)	208(100)	
≥100mg/dl	4(14.28)	5(17.85)	7(25)	12(42.85)	28(100)	

Triglyceride

<150mg/dl	18(12.5)	40(27.77)	32(22.22)	54(37.5)	144(100)	0.441(p=0.932)
≥150 mg/dl	12(13.04)	22(23.91)	22(23.91)	36(39.13)	92(100)	

HDL-Cholesterol

<50mg/dl	15(13.15)	19(16.66)	22(19.29)	48(42.10)	114(100)	11.28(p=0.010)
≥50mg/dl	15(12.29)	43(35.24)	32(26.22)	42(34.42)	122(100)	

Blood Pressure

<130/85mmof Hg	12(14.28)	23(27.38)	23(27.38)	26(30.95)	84(100)	3.23(p=0.357)
≥130/85mm of Hg	18(11.84)	39(25.65)	31(20.39)	64(42.10)	152(100)	

Table 2

Relationship of waist circumference, fasting blood glucose, triglycerides, HDL-cholesterol, and blood pressure with blood Hb level among rural elderly women (N=236):

<i>Parameter</i>	<i>Hb (gm/dl)</i>	<i>Statistical test</i>	
	<i>Median (IQR)</i>	<i>Mann Whitney U test</i>	<i>Spearman's correlation test</i>
		<i>Z value</i>	<i>ρ</i>

Metabolic Syndrome(IDF)

Yes	11.31(3.46)	-1.73 (p=0.084)	0.113(p=0.084)
No	10.49(3.63)		

Waist circumference

<80 cm	11(3.59)	-0.152 (p=0.879)	-0.01(p=0.879)
≥80 cm	10.87(3.8)		

Fasting blood glucose

<100mg/dl	11 (3.75)	-0.547(p=0.585)	0.036(p=0.586)
≥100mg/dl	10.25(4.79)		

Triglyceride

<150mg/dl	10.93(3.95)	-0.251(p=0.802)	0.016(p=0.802)
≥150mg/dl	10.87(3.35)		

HDL cholesterol

<50 mg/dl	11.29(3.23)	-1.211(p=0.226)	-0.097(p=0.227)
≥50mg/dl	10.25(3.77)		

Blood pressure

<130/85 mm of Hg	10.87(3.13)	-1.685(p=0.092)	0.110(p=0.092)
≥130/85 mm of Hg	10.87(3.84)		

Discussion

Reports on the prevalence of anaemia (52.5%-97.1%) among older adults in India are scanty (Swami, HM *et al.*, 2002; Joshi, K., *et al.*, 2003; Sharma, MK., *et al.*, 2005; Purty, AJ., *et al.*, 2006; Agarwal, S., *et al.*, 2011; Srimani, S., *et al.*, 2018). The present study detected 61.86 percent anaemic among the elderly women population in the study area. Anaemia in rural elderly women may be multifactorial in aetiology like nutritional, physiological, and pathological problems (Andrès, E., *et al.*, 2003). There is a higher prevalence of anaemia among women in the reproductive age group related to multiple pregnancies, nutritional imbalance, menstruation, and other gynaecological problems (Ibid). Anaemia developed during reproductive age, continue to exist in elderly women, in the absence of any proper continuous corrective measures (Ibid). The most common causes of anaemia in the elderly population are nutritional deficiencies, anaemia of chronic diseases, and unexplained anaemia (Ibid). In the present study, 57.15 percent anaemic rural elderly women had hyperglycaemia, however, no significant correlation existed like previous studies (Srimani, S. *et al.*, 2018; Thomas, MC., *et al.*, 2006; Thomas, MC., *et al.*, 2003; Thomas, MC., *et al.*, 2006; Shi Z, *et al.*, 2006). 57.9 percent of the studied population suffering from anaemia were observed to have low HDL-C. A significant association was observed between blood Hb and serum HDL-C levels (Table 1). A few reports postulated that low HDL-C level is associated with the occurrence of anaemia by increasing hepcidin level (Martinelli, N., *et al.*, 2012). It has been observed that 57.9 percent of elderly women with anaemia had BP $\geq 130/85$ mm of Hg. But, no significant relationship was observed like in previous studies (Shi, Z., *et al.*, 2006; Srimani, S., *et al.*, 2018). Considering MS and blood Hb level, previous three different studies (Shi, Z., *et al.*, 2006; Martinelli, N., *et al.*, 2012; Srimani, S., *et al.*, 2018) show a significant positive correlation (Table 2) but, no significant relationship was observed in the present study (Olivares, M., *et al.*, 2000; Guralink, JM., *et al.*, 2005; Shi, Z., *et al.*, 2008; Stein, J., *et al.*, 2014; Srimani, S., *et al.*, 2018). About 62.39 percent of the anaemic elderly women had ≥ 80 cm of WC but no significant correlation was observed.

Conclusion

The prevalence of anaemia and its coexistence with MS and its different components among rural elderly women was revealed at Amdanga block North 24th PPGS, West Bengal, India. Significant statistical association was found between HDL-C ($p<0.05$) and blood Hb status of the elderly women in the study area. Therefore, our study indicates that anaemia may increase the risk of developing MS and its different risk factors among rural elderly women or vice-versa, in the study area. Appropriate intervention may play an important role in improving the quality of life of this population.

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Prevalence and Predictors of Multi-morbidity among the Elderly of Paschim Medinipur : A Rural-Urban Comparison

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ABSTRACT

The present study compares the prevalence and lifestyle-related multimorbidity among the Bengali-speaking Hindu population of Paschim Medinipur district of West Bengal between rural and urban settings. 1000 individuals of both sexes (Males=467, Females=533 of age varying from 60 years and above, were selected by using purposive sampling method from the rural (males=263 and females=237) and urban (males=204 and females=296) areas. The socioeconomic profile and morbidity-related data were collected by using pretested questionnaires. The results showed a high prevalence of different groups of chronic diseases among the rural people, irrespective of sex. Fried food, perceived psycho-social stress, family type, educational status, monthly family income, daily activity pattern, and consumption of various types of food are found to be the significant determinants of multimorbidity. The present cross-sectional study suggests that rural people are unaware of the healthy lifestyle and were also suffering from chronic diseases more than their urban counterparts.

Keywords: Multimorbidity, Lifestyle, Elderly, Rural-urban, Midnapore, India

Ageing Multimorbidity can be explained as the occurrence of two or more disorders at a single point in time in an individual (Barnett, *et al.*, 2012). Compared to comorbidity, multimorbidity can be conceptualised as the co-occurrence of two or more mutually independent diseases (Pati, *et al.*, 2017). During the last couple of decades or more, multimorbidity has turned into a major medical issue for both, individuals and health care providers. As a consequence, chronic medical conditions and multimorbidity are increasing, which also correlates with age and might represent the most common “disease pattern” found among the elderly (Kirchberger, *et al.*, 2012). The major consequences of multi morbidity are disability and functional decline, poor quality of life, and high health care costs. Multimorbidity independently predicts adverse outcomes, including quality of life, mortality, disability, and complications of treatment beyond the effects of the individual conditions (Fortin, *et al.*, 2005).

The prevalence of multimorbidity rises significantly among individuals specifically with the increasing age of the population. Several studies have investigated the prevalence and significant determinants of MM in different developed as well as developing countries and studies also evidently determined the prevalence of significant predictors among study populations (Pati, *et al.*, 2017 & Aminisani, *et al.*, 2020). A study among the Scottish shows that more than 40 per cent of the population (including all ages) had at least one long-term chronic condition and almost 25 per cent of the whole population had more than one long-term condition (Barnett, *et al.*, 2012). In recent decades, chronic diseases are becoming the leading causes of death and disability worldwide. According to World Health Report (2002), reducing risks, promoting healthy life, indicate that mortality, morbidity, and disability are accredited to the major chronic diseases. Again, almost 60 per cent of all deaths and 43 per cent of the global burden of disease are being recorded (WHO, 2010; GBD 2019 Risk factors collaborators, 2020) and it has been reported that the four most prominent, well-known, and preventable chronic diseases are – cardiovascular diseases (CVD), cancer, chronic obstructive pulmonary disease (COPD) and type 2 diabetes. In addition, nerve, kidney, liver, mental health disorders, vision and hearing impairment, oral diseases, and bone-related diseases were

also identified as common chronic disorders. These diseases are further linked with very common and preventable biological risk factors, viz. high blood pressure, high blood cholesterol, and obesity, which are predominantly associated with major lifestyle-related risk factors like unhealthy diet, physical inactivity, psychosocial stress, and substances use using alcohol of tobacco (WHO, 2002).

Chronic diseases are reported to be a major cause of death and disabilities worldwide, and in India, due to chronic diseases, 53 per cent of all deaths have occurred (WHO 2005; Upadhyay, 2012). In India, the increasing trend of multimorbidity and the possible factors of multimorbidity have been demonstrated in several studies (Meliset, *al.*, 2014), and again, it has been shown that 1-year incidence of multimorbidity was 1.3 per cent in the whole population including all ages (Van den akkaar, *et al.*, 1998). A few possible risk factors for multimorbidity were identified, such as increasing age and a low socioeconomic status (Van den akkaar, *et al.*, 2000; Nagel, *et al.*, 2008) whereas a large social network seemed to have played a protective role (Van den akkaar, *et al.*, 2001). The study also revealed that one in three adults lives with more than one chronic condition, or multiple chronic conditions (MCC) which in turn, increases the uneven health and cost burden (Marengoni, *et al.*, 2008). Some studies have predicted that the number of patients, who live with more than four diseases at a single point in time, will become almost double within 2035 in the UK (Kingston, *et al.*, 2018; Hajat, and Stein, 2018). A few studies also showed that multimorbidity has a high prevalence among middle age group (45-64) people (Sakib, *et al.*, 2019). High prevalence of multimorbidity in low- and middle-income countries has also been reported (Wang, *et al.*, 2014) and people of those countries have frequently suffered from both physical and mental health issues at the same time (Lyneess, *et al.*, 2006). The prevalence of multimorbidity also increases significantly with age, while the sex of the individual was also a well-recognized and simultaneous determinant of multimorbidity (Violan, *et al.*, 2014). Some studies on the prevalence of multimorbidity have been conducted among elderly Indians too (Joshi, *et al.*, 2003; Purty, *et al.*, 2006). Robertson, *et al.*, (2020) showed the effect of urban-rural habitat and socioeconomic status on the prevalence of multimorbidity among hospitalized patients.

The Association of different lifestyle-related variables with multimorbidity has been shown by many studies both in developed and in developing countries, including India. Among Australian women, it has been reported that different multimorbidity patterns can be identified among mid-aged individuals with their social inequality, physical activity, and BMI (Jackson, *et al.*, 2016). Another study on Canadian adults showed a positive association between unhealthy lifestyle behaviours in terms of substances use (Smoking and consumption of alcohol), unhealthy dietary practices, physical inactivity, and multimorbidity (Fortin, *et al.*, 2014). Another study among the elderly demonstrated that the perceived quality of life had a substantial effect on the multimorbidity profile (Noberga, *et al.*, 2009). A fairly higher prevalence of multimorbidity and its positive association with socio-economic status and unhealthy behavioural issues have been shown among the adults of Nepal (Yadav, *et al.*, 2020). Lower socio-economic status and higher smoking were found to be associated with a higher prevalence of multimorbidity among the Albanians (Kraja, *et al.*, 2016). The study also reported that unhealthy lifestyle behaviour and chronic diseases are significantly associated with poor SRH (self-rated health) among Malaysian adults (Chan, *et al.*, 2015). Multimorbidity was also found to be a significant issue among the population of Ghana and the risk factors for its occurrence were found to be age, sex, and a family history of chronic disease (Nimako, *et al.*, 2013).

A cross-sectional study conducted among adult primary care patients in Odisha, India, showed a high prevalence of multimorbidity and hospitalizations among those individuals who were from higher socioeconomic status (Pati, *et al.*, 2015). Increasing disability and distress, age, sex, and occupation have been reported as important associates of multimorbidity among the elderly people of Chandigarh and Hariyana (Joshi, *et al.*, 2003). A couple of studies (Swami, *et al.*, 2002; Kadam, *et al.*, 2007) revealed that multimorbidity is quite common in the aged population and it may decrease functional status. A study including four states, namely, Karnataka, Kerala, Punjab, and Rajasthan of India indicated that older adults living with multimorbidity are found with a significantly high risk of limitations on activities of daily living (ADL) and poor self-rated health (Arokiasamy, *et al.*, 2015). Himanshu and Talukder, (2017) further

revealed a positive association of multimorbidity with marital status, rural living, and older age.

The above brief literature review is indicative of the fact that studies on multimorbidity and its plausible correlates have mostly been done among the population residing in cities and a rural-urban comparison about multimorbidity is lacking in the Indian perspective. Hence, the principal aim of the present study was to evaluate the prevalence of multimorbidity among the Bengali-speaking Hindu population, residing in PaschimMedinipur district of West Bengal, India, in a rural-urban comparative manner. The study also identified the lifestyle-related predictors of multimorbidity among the study population.

Method

Sample

The present study was carried out among the Bengali speaking (Hindu) 1000 respondents of both the sexes (Males=467, Females=533) of age varying from 60 years and above, were selected by using purposive sampling method from the rural (males=263 and females=237) and urban (males=204 and females=296) areas of PaschimMedinipur district of West Bengal. The urban study participants were residing in Midnapore town, while the rural study participants were selected from five villages, namely Bonpura, Chandra, Dherua, Kankabati, Monidaha, which are situated at a distance of about 30 km. from Midnapore town.

Procedure

Verbal consent was taken before collecting any data from each of the study participants. Data on socioeconomic and demographic profiles, which include age, sex, marital status, educational status, occupational status, present working status, source of income, and family income of the study participants, were collected with the help of a pretested questionnaire. The voters' list was followed to locate the residences of the study participants and to verify their age. They were asked about their age which was further substantiated with the available document(s) like Aadhar card and/or voter card and/or pension book. Data on dietary practices were collected through a food frequency questionnaire (FFQ) for homemade and out-of-home

food consumption. The numbers of servings of each food item per year were calculated and used in inferential statistical analysis. Data on their perceived notion on daily activity patterns and practicing physical exercise for health were collected. The daily activity pattern has been categorized as heavy, moderate, and light. Data on tobacco use (chewing and smoking) and alcohol consumption were collected as binary (Yes/No) variables. Data on perceived stress was collected by using the questionnaire proposed by Levenstein, *et al.*, (1993) which is one of the most commonly used tools to determine the perceived psychosocial stress level. It is a Likert-type questionnaire comprising of 30 questions with four options, viz. seldom / sometimes / often / usually. The scoring was done for each of them separately. Data on multimorbidity was collected based on prescriptions by a professional medical practitioner. After collecting the morbidity profile of each study participant, all the chronic ailments were clubbed under various broad groups, viz. nervous system disease (Paralysis, Parkinsonism, Epilepsy, Dimensia, Schizophrenia, Tremor, and Insomnia); respiratory system disease (Asthma, Chronic Obstructive Pulmonary Disease (COPD), Bronchitis and Tuberculosis); cardiovascular disease (Hypertension, Diabetes, and Dyslipidaemia), bone disease (Arthritis, Rheumatism, and Spondylitis), liver and kidney-related diseases, eye and ear-related diseases, gynecological (for females) disorders, hematological diseases, and gastrointestinal diseases.

Statistical analyses

Chi-square and t-test analyses were calculated for qualitative and quantitative variables, respectively, to evaluate the habitat and sex difference for socio-economic, physical activity pattern, dietary practices, perceived psycho-social stress, and other chronic illnesses. Stepwise discriminant analysis was performed separately for sex to identify the subset among Socio-economic & demographic, in-home food consumption, out of home food consumption, and chronic disease variables having significant habitat differences. Adjusted logistic regression analysis was performed to identify the significant lifestyle-related predictor(s) of multimorbidity separately for sex and habitat. $p < 0.05$ was fixed to identify the level of significance and all statistical analyses were done with the help of SPSS 16.0 software.

Results

Table 1

Demographic and socio-economic characteristics of the study participants, by sex and habitat group

Age and sex distribution of the study participants										
Category	Male					Female				
	Urban		Rural		χ^2 value	Urban		Rural		χ^2 value
	n	%	n	%		n	%	n	%	
60-70	90	9.0	154	15.4	11.15 *(df=3)	172	17.2	162	16.2	17.57** (df=3)
71-80	75	7.5	73	7.3		89	8.9	42	4.2	
81-90	32	3.2	33	3.3		30	3.0	19	1.9	
> 90	7	0.7	3	0.3		5	0.5	14	1.4	
Marital status of the study participants										
Married	174	17.4	230	23.0	0.59 (df=2)	192	19.2	175	17.5	9.79** (df=2)
Unmarried	15	1.5	15	1.5		9	0.9	13	1.3	
Others [‡]	15	1.5	18	1.8		95	9.5	49	4.9	
Educational status of the study participants										
Non-literate	25	2.5	63	6.3	136.32** (df=3)	48	4.8	121	12.1	90.42** (df=3)
Pre-secondary	43	4.3	152	15.2		135	13.5	90	9.0	
Secondary	55	5.5	41	4.1		78	7.8	21	2.1	
Higher Studies	81	8.1	7	0.7		35	3.5	5	0.5	
Monthly family incomes of the study participants										
≤10000	54	5.4	111	11.1	92.20** (df=2)	93	9.3	133	13.3	96.60** (df=2)
10001-19999	50	5.0	127	12.7		82	8.2	94	9.4	
≥20000	100	10.0	25	2.5		121	12.1	10	1.0	
Monthly family expenditure of the study participants										
≤10000	96	9.6	196	19.6	45.02** (df=2)	146	14.6	200	20.0	74.20** (df=2)
10001-19999	92	9.2	66	6.6		132	3.2	37	3.7	
≥20000	16	1.6	1	0.1		18	1.8	0	0	
Family type of the study participants										
Nuclear	94	9.4	115	11.5	19.55** (df=2)	145	14.5	71	7.1	32.63** (df=2)
Joint	95	9.5	91	9.1		130	13.0	115	11.5	
Broken or Extended	15	1.5	57	5.7		21	2.1	51	5.1	

Occupational status of the study participants

None	22	2.2	28	2.8	162.12** (df=4)	52	5.2	93	9.3	191.09** (df=4)
Service	74	7.4	20	2.0		31	3.1	6	0.6	
Business/ Homemaker	44	4.4	24	2.4		134	13.4	4	0.4	
Agriculture	19	1.9	170	17.0		48	4.8	124	12.4	
Pension holder	45	4.5	21	2.1		31	3.1	10	1.0	

**Significant at $p < 0.001$ level, *Significant at $p < 0.05$ level; # Widowed/Widower/Divorced

Table 1 shows the highest percentage of individuals, irrespective of sex and habitat, are found in the age group 60-69 years, while, as expected, the lowest numbers of participants are found in the highest age group. Again, as expected, the highest percentage of study participants is found to be married. The table also shows a significantly higher level of educational status, monthly income, and expenditure among the urban study participants, irrespective of sex. The majority of the participants belong to joint and nuclear families. Significant rural-urban difference in occupational status has also been evident irrespective of sex.

Table 2

Perceived notion on daily activity pattern and physical exercise of the study participants, by sex and habitat group

Daily activity pattern		Male					Female				
		Urban		Rural		χ^2 value	Urban		Rural		χ^2 value
		n	%	n	%		n	%	n	%	
Perceived notion	Heavy	23	2.3	74	7.4	36.34** (df=2)	34	3.4	32	3.2	4.59 (df=2)
	Moderate	101	10.1	143	14.3		151	15.1	137	13.7	
	Light	80	8.0	46	4.6		111	11.1	68	6.8	
Physical exercise	Yes	58	5.8	101	10.1	5.08* (df=2)	60	6.0	59	5.9	1.62 (df=2)
	No	146	14.6	162	16.2		236	23.6	178	17.8	
Walking [@]	Yes	158	15.8	141	14.1	28.34** (df=2)	186	18.6	90	9.0	32.58** (df=2)
	No	46	4.6	122	12.2		110	11.0	147	14.7	
Distance of walking	<3 km	109	10.9	37	3.7	107.36** (df=3)	162	16.2	25	2.5	119.87** (df=3)
	3-8 km	48	4.8	59	5.9		21	2.1	53	5.3	
	≥9 km	1	0.1	45	4.5		3	0.3	12	1.2	

**Significant at $p < 0.001$ level, *Significant at $p < 0.05$ level; # for keeping good health; [@] For occupation and other works

Table 2 depicts the physical activity pattern of the study participants, by sex and habitat group. The maximum percentage of the respondent is engaged in a moderate type of daily activity pattern, irrespective of sex and habitat group. Practicing physical exercise for health is found to be less among the study participants, however, habitual regular walking is very frequent among both sexes irrespective of habitat. Maximum percentages of study participants are found to walk less than 3km. per day except for rural females.

Table 3
Substances use (tobacco and alcohol) status of the study participants, by sex and habitat group

Substance use	Male					Female				
	Urban		Rural		χ^2 value	Urban		Rural		χ^2 value
	n	%	n	%	(df-1)	n	%	n	%	(df-1)
Smoker	103	10.3	129	12.9	0.95	0	0	7	0.7	8.85**
Chewer	79	7.9	108	10.8	0.26	95	9.5	74	7.4	0.04
Drinker	59	5.9	144	14.4	31.19**	34	3.4	38	3.8	2.329

**Significant at $p < 0.001$ level

Table 3 reveals the substance use pattern in terms of smoking, chewing, and alcohol consumption. Smoking is very much prevalent among the males of both habitat groups. However, a significantly higher percentage of rural females are found to be smokers ($p < 0.001$). Chewing tobacco has been found among both sexes, irrespective of habitat group. Drinking of alcoholic beverages has been found in both the sexes, while rural males show a significantly higher percentage than their urban counterparts ($p < 0.001$).

Table 4
Descriptive statistics of perceived stress index of study participants, by sex & habitat group

Male					Female				
Urban		Rural		t value (df- 465)	Urban		Rural		t value (df- 531)
Mean	SD	Mean	SD		Mean	SD	Mean	SD	
0.37	0.14	0.49	0.10	-10.83**	0.39	0.14	0.50	0.095	-10.99**

**Significant at $p < 0.001$ level

Table 4 shows the mean and standard deviation (SD) values of the perceived stress score index of the study participants, by sex and habitat group. Both males and females of the rural area show significantly higher mean values of perceived stress index than their urban counterparts.

Table 5a

Number of servings of food items (homemade and out of home)
per year among the males

<i>Homemade food item</i>	<i>Urban</i>		<i>Rural</i>		<i>t value</i> (<i>df</i> - 465)
	<i>Mean±SE</i>	<i>SD</i>	<i>Mean±SE</i>	<i>SD</i>	
Rice	699.12±22.12	315.97	744.71±16.69	315.97	-1.67
Cereals	30.28±5.89	84.136	155.51±10.82	175.50	-9.38**
Vegetables	839.53±22.44	320.63	656.22±17.82	289.05	6.47**
Sweet products	8.02±2.08	29.70	26.83±1.77	28.74	-6.91**
Fruits	84.11±9.77	139.55	35.05±1.48	24.10	5.59**
Mutton	5.17±1.05	15.05	6.06±0.489	7.93	-0.82
Fish	203.59±13.85	197.94	161.16±6.57	106.56	2.96*
Roti	205.19±10.49	180.57	243.50±10.00	154.03	-2.64*
Pulses	132.81±12.64	217.52	9.50±3.41	52.54	10.48**
Milk	56.12±7.16	123.27	67.38±6.95	106.99	2.29
Homemade noodles	3.65±1.07	18.47	2.79±0.68	10.61	0.09
Chicken	61.92±3.44	59.22	50.51±2.32	35.83	1.77
Egg	109.78±6.93	119.22	130.96±7.05	108.55	-3.59**
Paratha	25.98±3.18	54.86	23.88±1.38	21.34	-0.54
Fried food	35.31±3.00	51.70	74.23±3.83	59.06	-5.39**
Out of home food item					
Fried rice	0.39±0.19	2.79	0.49±0.10	1.77	-0.48
Chowmein	0.91±0.40	5.75	0.28±0.09	1.55	1.68
Biryani	1.76±0.61	8.79	0.84±0.21	3.45	1.54
Chocolate	5.35±1.84	26.33	21.46± 2.11	34.29	-5.55**
Fried snacks	54.79±11.06	158.02	64.27±3.72	60.32	-0.89
Oily non-veg food	1.06±0.11	10.27	18.80±2.31	37.46	-6.57**
Sweets	88.71±16.94	241.95	38.77±3.24	52.57	3.25*
Soft drink	1.11±0.33	4.820	2.87±0.31	5.03	-3.81**
Pastry	0.03±0.02	0.30	0.14±0.07	1.27	-1.12
Ice cream	1.42±0.365	5.20	2.10±0.31	5.13	-1.41

**Significant at $p < 0.001$ level, *Significant at $p < 0.05$ level; Table 5a depicts the mean and standard deviation values of homemade and out-of-home food consumption of the males. The t-test statistics show that rural individuals consume a significantly higher amount of soft drinks, oily non-veg foods, and chocolates from outside and fried food items, eggs, pulses, and many more food items cooked in their kitchen than their urban counterparts.

Table 5b

Number of servings of food items (homemade and out of home)
per year among the females

Homemade food item	Urban		Rural		t value (df- 531)
	Mean $\pm$ SE	SD	Mean $\pm$ SE	SD	
Rice	761.75 $\pm$ 329.46	329.46	723.95 $\pm$ 16.28	250.73	1.46
Cereals	29.86 $\pm$ 4.91	84.47	151.76 $\pm$ 10.60	163.18	-11.12**
Vegetables	836.89 $\pm$ 15.12	260.26	622.60 $\pm$ 18.00	277.21	9.17**
Sweet products	5.84 $\pm$ 0.79	13.65	22.89 $\pm$ 1.20	18.60	-12.18**
Fruits	57.82 $\pm$ 6.51	112.09	30.72 $\pm$ 1.44	22.22	3.66**
Mutton	4.62 $\pm$ 1.02	17.54	4.64 $\pm$ 0.36	5.66	-0.019
Fish	178.12 $\pm$ 7.90	135.92	147.33 $\pm$ 4.14	63.86	3.21**
Roti	205.19 $\pm$ 10.49	180.57	243.50 $\pm$ 10.00	154.03	-2.596*
Pulses	132.81 $\pm$ 12.64	217.52	9.50 $\pm$ 3.41	52.54	8.52**
Milk	56.21 $\pm$ 7.16	123.27	67.38 $\pm$ 6.95	106.99	-1.10
Homemade noodles	3.65 $\pm$ 1.07	18.47	2.79 $\pm$ 0.68	10.61	0.637
Chicken	61.92 $\pm$ 3.44	59.22	50.51 $\pm$ 2.32	35.83	2.60*
Egg	109.78 $\pm$ 6.93	119.22	130.96 $\pm$ 7.05	108.55	-2.12*
Paratha	25.98 $\pm$ 3.18	54.86	23.88 $\pm$ 1.38	21.34	.556
Fried food	35.31 $\pm$ 3.00	51.70	74.23 $\pm$ 3.83	59.06	-8.10**
Out of home food item					
Fried rice	0.24 $\pm$ 0.08	1.39	0.57 $\pm$ 0.09	1.51	-2.62*
Noodles	1.75 $\pm$ 0.79	13.66	0.10 $\pm$ 0.02	0.43	1.85
Biriyani	0.48 $\pm$ 0.23	3.95	0.46 $\pm$ 0.10	1.61	0.05
Chocolate	2.05 $\pm$ 0.54	9.31	22.43 $\pm$ 2.21	34.08	-9.83**
Fried snacks	44.89 $\pm$ 4.78	82.34	62.03 $\pm$ 3.80	58.56	-2.70*
Oily non-veg food	1.31 $\pm$ 0.63	10.88	23.67 $\pm$ 2.83	43.59	-8.50**
Sweets	1.94 $\pm$ 0.45	7.88	2.33 $\pm$ 0.24	3.76	1.56
Soft drink	0.07 $\pm$ 0.04	0.80	0	0	-0.70
Pastry	2.28 $\pm$ 0.54	9.41	1.54 $\pm$ 0.12	1.97	1.41
Ice cream	0.44 $\pm$ 0.20	3.55	0	0	1.17

Table 5b shows the mean and standard deviation values of homemade and out-of-home food consumption of the females. Among the out-of-home food items, consumption of oily non-veg foods, chocolates, fried snacks, and fried rice was found to be significantly higher among rural women than their urban counterparts. Alike men, rural women also consume a significantly higher amount of fried food, eggs, sweet products, pulses, and some other food items, cooked in their kitchen, than their urban counterparts.

Table 6

Morbidity profile of the study participants, by sex and habitat group

Chronic disease group	Male					Female				
	Urban		Rural		χ^2 value (df-1)	Urban		Rural		χ^2 value (df-1)
	n	%	n	%		n	%	n	%	
Nerve	36	3.6	79	7.9	9.50**	40	4.0	63	6.3	14.41**
Cardiovascular	95	9.5	152	15.2	5.81*	132	13.2	85	8.5	4.15*
Lung	35	3.5	70	7.0	5.89*	50	5.0	58	5.8	4.68*
Bone	28	2.8	101	10.1	34.99**	73	7.3	81	8.1	5.80*
Liver & kidney	0	0	42	4.2	35.79**	5	0.5	16	1.6	8.91*
Gynecological	-	-	-	-	-	6	0.6	40	4.0	36.81**
Gastrointestinal	62	6.2	133	13.3	19.23**	111	11.1	101	10.1	1.43
Haematological	6	0.6	26	2.6	8.68**	15	1.5	37	3.7	16.62**
Ear & Eye	32	3.2	82	8.2	14.94**	50	5.0	72	7.2	13.56**

Table 6 demonstrates the prevalence of major chronic illnesses among the study participants, by sex and habitat groups. It has been found that for almost all the diseases, rural participants, irrespective of sex, show significantly higher prevalence than their urban counterparts, except for gastrointestinal and cardiovascular diseases, where urban females show a marginally higher percentage than rural females.

Table 7a

Result of stepwise discriminant analysis of socioeconomic, in-home, and out of home food consumption and chronic illnesses variables among males

Result of stepwise discriminant analysis among Males							
Socioeconomic & demographic		In-home food consumption		Out of home food consumption		Chronic disease	
Variable	Wilks's λ	Variable	Wilks's λ	Variable	Wilks's λ	Variable	Wilks's λ
Monthly family income	0.752	Fried food	0.529	Oil-rich non-veg items	0.836	Liver & kidney-related	0.885
Work status	0.728	Cereals	0.557	Chocolate	0.830	Bone related	0.872
Family type	0.721	Vegetables	0.529	Sweets	0.818	Gastrointestinal	0.841
Educational qualification	0.715	Sweet products	0.516	Soft drinks	0.823	Haematological	0.832
		Chicken	0.516	Biryani	0.816		
		Fruits	0.515				
Percentage of cases correctly classified by the identified variable	75.6		70.4		85.9		87.2

Table 7a depicts the result of stepwise discriminant analysis to identify the subset of among socioeconomic, dietary, and chronic disease variables having significant habitat differences, among the males. Among the SES variables, income, working status, family type, and educational qualification; among the in-home and out of home food items, cereals, vegetables, fried items, chicken, soft drinks, oily non-veg food, and some other items and among the disease groups liver & kidney related, bone-related, gastrointestinal and hematological disease groups have been identified having significant habitat differences among the males.

Table 7b

Result of stepwise discriminant analysis of socioeconomic, in-home, and out of home food consumption and chronic illnesses variables among females

Socioeconomic & demographic		In-home food consumption		Out of home food consumption		Chronic disease	
Variable	Wilks's λ	Variable	Wilks's λ	Variable	Wilks's λ	Variable	Wilks's λ
Monthly family income	7.02	Sweets	0.550	Chocolate	0.768	Gynecological	0.916
Family type	0.740	Cereals	0.552	Oil-rich non-veg	0.772	Haematological	0.895
Work status	0.678	Vegetables	0.556	Ice cream	0.757	Liver & kidney-related	0.890
Educational qualification	0.663	Fried food	0.539	Fried snacks	0.759	Eye and ear-related	0.891
Marital status	0.660	Chicken	0.542	Sweets	0.760	Cardio-vascular	0.891
		Fish	0.535				
Percentage of cases correctly classified by the identified variable	75.2		84.8		74.1		87.2

Table 7b demonstrates the result of stepwise discriminant analysis to identify the subset of among socioeconomic, dietary, and chronic disease variables having significant habitat differences among the females. Among the SES variables, income, working status, family type, marital and educational status; among the in-home and out of home food items, cereals, vegetables, fried items, chicken, soft drinks, fish, oily non-veg food, ice-cream and some other items and among the disease groups liver & kidney related, eye and ear related, cardiovascular, gynecological and hematological disease groups have been identified having significant habitat differences among the females.

Table 8

Result of adjusted multiple logistic regression analysis (forward conditional), using lifestyle-related variables as independent and multimorbidity as dependent variables, by habitat group

Sex & Habitat	Variable	B	S.E.	Wald	df.	p-value	Exp.(B)	95.0% C.I. for EXP(B)	
								Lower	Upper
Urban males	Fried food	-0.009	0.002	16.741	1	0.000	0.991	0.986	0.995
	Stress	-2.435	1.148	4.496	1	0.034	0.088	0.009	0.832
	Constant	1.834	.461	15.817	1	.000	6.259	-	-
Rural males	Family type	-0.623	0.214	8.517	1	0.004	0.536	0.353	0.815
	Education	0.583	0.212	7.554	1	0.006	1.792	1.182	2.716
	Fried food	.005	0.002	4.450	1	0.035	1.005	1.000	1.009
	Constant	-1.360	0.527	6.653	1	0.010	.257	-	-
Urban females	Monthly income	-0.935	0.189	24.424	1	0.000	.0393	0.271	0.569
	Family type	-0.448	0.229	3.835	1	0.050	0.639	0.408	1.000
	Fried food	-0.007	0.003	5.106	1	0.024	0.993	0.986	0.999
	Daily activity pattern	0.488	0.220	4.928	1	0.026	1.628	1.059	2.505
	Constant	1.729	.712	5.900	1	.015	5.636		
Rural females	Family type	-1.004	0.242	17.218	1	.000	0.366	0.228	0.589
	Education	0.966	0.227	18.146	1	.000	2.628	1.685	4.100
	Sweets	0.016	0.005	11.795	1	.001	1.016	1.007	1.026
	Vegetable	0.001	0.001	5.159	1	.023	1.001	1.000	1.003
	Daily activity pattern	1.434	0.423	11.492	1	.001	4.194	1.831	9.607
	Constant	-3.119	1.045	8.909	1	.003	.044		

Table 8 demonstrates the result of adjusted multiple logistic regression analysis (forward conditional) using multimorbidity as a dependent variable, and lifestyle-related variables as independent variables, by sex. Fried food and family type were identified as significant predictors of all the sub-groups except rural females and urban males, respectively. Among the other significant predictors, daily activity pattern and educational status significantly predict multimorbidity among females of both the habitats and rural participants of both sex respectively. Monthly income, stress, consumption of sweets and vegetables were other significant predictors of multimorbidity of different sub-populations.

Discussion

It is well known that the occurrence of multimorbidity is increasing and it is gradually becoming a challenge for a health care provider. The growing prevalence of multiple chronic diseases is an increasing burden for the aged people (Fortin,*et al.*, 2005; Uijen and Vande Lisdonk, 2008). It has been shown earlier that multimorbidity is more prevalent and occurs among socioeconomically deprived people. Those who are aged, socioeconomically deprived regular smokers, occasional alcohol consumers, and survived after stroke and cardiac arrest were at higher risk of multimorbidity (Huntley, 2012;Gallacher, 2018). Again, a meta-analysis showed the effect of educational status on multimorbidity in which low- versus high-education level is significantly associated with an increased prevalence of multimorbidity (Pathiran and Jackson 2018). Some studies have also revealed that socioeconomic deprivation was predominantly associated with multimorbidity including mental health disorders (Barnett,*et al.*, 2012; Jensen,*et al.*, 2017).The present comparative study revealed that every type of chronic illness or diseases are significantly more predominant among the rural socio economically deprived participants of both sexes than their urban counterpart, which is in the same line as the afore mentioned studies. It has been found that fewer numbers of urban participants were having liver and kidney-related problems, but on the other hand, the same chronic illnesses were more frequently found among rural people, irrespective of sex. A similar finding has been reflected in a previous study which indicated a relatively higher prevalence of liver and kidney-related morbidity among the rural population (Coughlin,*et al.*, 2019).Although not found as significant predictors in adjusted logistic regression analysis, it has been evident from the results that higher numbers of rural study participants consume alcohol and fried food items than their urban counterparts, irrespective of sex, which might cause adverse liver function among them.

It is evident from many studies that a clear sexual dimorphism exists between socioeconomic, lifestyle, and chronic illness variables (Neufcourt,*et al.*, 2020;Singh,*et al.*, 2020; de Souza,*et al.*, 2021;

Mustard, and Etches 2003). We also found certain sex-specific variables showing significant rural-urban discrimination and thus, stepwise discriminant analyses were performed which identified a subset of socioeconomic, food consumption (in-home and out of home), and chronic illnesses variables showing significant rural-urban differences, separately for sex. It helps in identifying separate subsets of variables showing significant habitat differences for males and females.

In adjusted logistic regression analysis, consumption of fried food items and perceived psycho-social stress were identified as significant predictors of multimorbidity among the urban males, while among the rural males, the significant predictors of multimorbidity are found to be family type, educational status, and consumption of fried food. On the other hand, monthly family income, family type, consumption of fried food, and daily activity pattern were found as significant determinants of multimorbidity among urban females. Among the rural females, family type and daily activity pattern remained the significant predictors of multimorbidity as have been found among the urban females. Additionally, consumption of sweet products and vegetables was also found to predict multimorbidity significantly among rural females. Many studies have reported older age, being female, living without a spouse, inadequate consumption of fruits and vegetables, and mental health-related symptoms as significant predictors of multimorbidity (Aminisani, *et al.*, 2020; Melis, *et al.*, 2014).

From this small-scale cross-sectional study we can conclude that the rural people are unaware of a healthy lifestyle and were also more affected by chronic diseases than urban counterparts. The present study also suggests that various kinds of awareness programmes and healthcare-related camps are necessarily required for improvement and better understanding regarding chronic diseases and healthy lifestyles. Chronic disease and its determinants related to education are essential among the study participants. The study will be considered as baseline research to formulate further large-scale studies on multimorbidity.

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Nurses' Perspectives of Elderly Care in Selected Hospitals, Yenagoa, Bayelsa State, Nigeria

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ABSTRACT

Elderly care is an important aspect of health care because elderly patients need a lot of care and attention. This study investigated 100 nurses' perspectives of elderly care in selected hospitals in Yenagoa Bayelsa State, Nigeria. The study adopted a sequential explanatory mixed-method design with one hundred eligible nurses recruited into the study using both simple random and purposive sampling techniques. An adopted and modified closed-ended questionnaire was used to collect data for the quantitative study and an interview guide was used for the qualitative data. Statistical Package for Social Sciences was used for data analysis for the quantitative study. The quantitative study revealed that nurses had a positive perspective with 71 per cent strongly disagreeing that elderly care is safer in the hospital, majority of the respondents 92 (92%) disagreed that elderly care is care provided only in the hospital by non-geriatrics, (56%) strongly agreed. Experience and Expectations of the nurse affect nurses' perspectives of elderly care. A-five step thematic analysis was conducted. Three themes that emerged were mainly the challenges, such as inadequate nursing staff, poor funding by the government, growing population of the elderly, lack of special care center indicating the need to improve elderly care. Thus, it is important to conclude that elderly care in hospitals needs a lot of attention in the study area.

Keywords: Elderly, Nurses, Nursing Care, Perspective.

Globally, the proportion of elderly people (60 years and older) has increased substantially within a relatively short period due to the overall reduction in fertility and increase in better healthcare as well as proper nutrition and diseases prevention (Costa, 2015). Age comes with many challenges and specialized nursing care should be readily available (Courtney, *et al.*, 2016); and the quality of health care offered to the elderly in hospitals is not adequate (Polat, *et al.*, 2014).

Furthermore, about 80 per cent of the elderly problems are preventable, usually with easy and affordable good care models, such as encouraging mobilization or better managing incontinence (WHO, 2017). Any failure in the ability as a result of nurses' perspective could result in a decline in functional ability which could limit the elderly and the care instituted by the nurses. The goal of nursing care is to assist persons in attaining optimal health, well-being, and quality of life as determined by those receiving care. The expected nursing care could be timely health care carried out by nurses for patients to improve health, assist, and give support (Mukoro, 2011).

Nurses' perspective about the elderly might warrant the development of attitude either in a positive or negative light towards the elderly and in turn the response of the elderly towards their care, has a detrimental effect (Huda, *et al.*, 2018). Increasing need and decreasing resources suggest the need to focus on the quality aspect of treatment and care for older adults through nurses' perspectives to give more attention to areas that would promote effective nursing care (Little & McGivern, 2016). Moreover, Nurses provide good health care for the increasing number of people who are growing older, this increase became obvious from 2016 to 2019 (WHO, 2017). It is common for the population of the elderly to become helpless, defenseless, fragile, and unproductive, not just because of diminishing functional systems they are experiencing, but because of the way the society and family members see them (Renata, *et al.*, 2014). Therefore, this study will investigate the perspective of nurses in elderly care to enable timely resolution of the likely complaints that may prevent their care.

About 77 per cent of the nursing professionals and 94 per cent of the older adults thought that improvements were still needed in care for older people in the area of better integration of the different aspects

of care and a more patient-centered approach. This is because it is increasingly recognized that elderly patients have specialized needs and are the major consumers of health care, given they are frail (Chang, *et al.*, 2013; Clegg, *et al.*, 2013).

In Nigeria, there is a drastic rise in the elderly populace that needs health care services, especially the frail elderly (Abduraheem & Abdulrahman, 2016). Nurses are front-line elderly health care providers in a variety of settings. Furthermore, in Nigeria, the economic situation of most children makes it difficult for them to cater to their parents. Coupled with the lack of institutional framework for the care of the old, some Nigerian parents end up being physically and emotionally abused, they are not properly cared for in the hospitals (Mudiare, 2013). As people age, they become less active, frailer, and more prone to diseases associated with ageing, which often require hospitalization (Denis & James, 2011).

It is expedient to conduct this study to have an idea of nurses' perspective on whether or not the elderly care and support has been born with their experience and expectations. Therefore, this study was planned to investigate the nurses' true perspective and the factors responsible for elderly care in selected hospitals of Bayelsa state, Nigeria.

Objectives of the Study

1. To investigate the perspective of nurses caring for the elderly in the selected hospitals.
2. To assess the knowledge of nurses on elderly care in the selected hospitals.
3. To identify the factors (attitude, interest, patience, etc.) that affect nurses' perception of elderly care in the selected hospitals.

Methodology

Sample

The population for this study was 153 male and female nurses working in three hospitals of Yenagoa metropolis namely: Federal Medical with 83 Nurses, Niger delta university teaching hospital with 48 Nurses, and Diete-koki memorial hospitals with 32 Nurses. The target population, therefore, included those nurses who were presently

caring for elderly patients or have cared for the elderly patients from six months and above. All these hospitals are situated in Yenagoa. These three settings were most preferred because of their strategic position in health care delivery in Yenagoa Bayelsa state. The researchers used these hospitals because they are tertiary institutions centrally located in the state capital with wards where elderly persons are getting care alongside other patients. 100 nurses were selected randomly from those nurses who were presently working in the selected hospitals who are caring for elderly patients. Only those nurses, who were available and willing to participate, were selected for this study.

The instrument for data collection

A questionnaire consisted of two sections: A and B was used in the data collection. Section A consisted of the demographic information of participants. Section B consisted of the research questions of nurses' perspectives of elderly care in the selected hospitals. A semi-structured interview schedule containing open-ended questions was also used. Each participant was interviewed individually.

Reliability and validity of the questionnaire used

The researcher ensured the content validity of the instrument by presenting the questionnaire to experts to evaluate the content of the questionnaire; whether the questionnaire was measuring what it needs to measure before distribution of the research respondents.

The test-retest method was used to establish the reliability of the questionnaire. It involved selecting a few nurses who were newly employed in the ward for not less than 6 months and trying out the study on them, in two different occasions in an interval of two (2) weeks. The data obtained was then subjected to the Pearson Product Moment Correlation, which yielded a correlation coefficient of 0.84

The researcher-achieved trustworthiness through four criteria, which included confirmability, credibility, transferability, and dependability (Nowell, *et al.*, 2017). Credibility was ensured by using an adapted interview guide for one on one interviews with participants, in a period two weeks. Earlier on the researcher carried out a trial run

on two nurses who are ineligible in the selected hospitals but have had similar experiences in their places of duty.

Procedure for data collection

Two procedures were used in this mixed-method study as follows: The researchers obtained permission from the Ministry of Health through their various Heads of Planning Research and Statistics (PRS). One hundred and ten (110) questionnaires were distributed after consent forms were retrieved. For the quantitative study, three (3) days later, with the help of a mediator, Researchers went and administered the same number (110) of questionnaires, giving them a clue on how to fill the questionnaire. After four (4) working days Researchers went back and retrieved the answered questionnaires with the mind that, within the four days, all eligible respondents must have reported on duty at one time or the other. Out of the 110 questionnaires, the Researchers retrieved one hundred and five (105) of which 100 questionnaires were well filled.

For the qualitative study, the researchers conducted a one-on-one interview with the help of the semi-structured interview guide for consistency of questions. Eligible participants were met mostly in the mornings during breaks because nurses were busy then and occasionally in the evening to get accurate data saturation. In each interview session, the interviews were conducted privately at the Matrons' offices which lasted 15-20 minutes. The researcher asked open-ended questions and further probed to clarify unclear issues. Data saturation was rich as at the 10th participant, thus researchers added three more to be sure no new information was available. Another instrument is a voice recorder, a voice recorder (android phone) was used to record proceedings.

Method of data analysis

In the quantitative phase of this study, SPSS (Statistical Package for the Social Sciences), also known as IBM SPSS Statistics, was the software package used for the analysis of data. In analyzing the data collected using a questionnaire, the researcher used descriptive sample, percentage, tables, and frequency distribution as statistical tools.

For the Qualitative, Creswell six (6) steps of the qualitative line by line thematic data analysis were done to ensure accuracy of the data collected (Creswell, 2013).

Step one was a transcription of the recorded version; Step two was a repeated reading and code-able areas highlighted; Step three was the formation of categories; Step four sub-themes were identified and Step five was theme formation. The final step was the discussion of triangulated results from both the quantitative and the qualitative results.

The researchers obtained permission from the appropriate authority to conduct the research. The respondents were given elaborate facts about the study and were ensured that the participants are not to be harmed in any way, physically, psychologically, emotionally, and socially. Information given by them will be used only for the study and anonymity was ensured by excluding names and identity of both respondents and participants.

Findings

Table 1

Socio-Demographic Variables of Respondents(N=100) for both quantitative and qualitative data

<i>Quantitative Statements</i>	<i>Quantitative Frequency</i>	<i>Quantitative Percentage (%)</i>	<i>Qualitative Frequency</i>	<i>Qualitative Percentage (%)</i>
Sex				
Male	31	31.0%	3	25.00%
Female	69	69.0%	9	75.00%
Total	100(100%)	100%	12(12%)	(100%)
Age				
18-20	23	23.0	2	16.66
21-30	45	45.0	2	16.66
31-40	17	17.0	3	25.00
41-50	15	15.0	5	41.66
Marital status				
Single	59	59.0	2	16.66
Married	34	34.0	3	25.00
Divorced	5	5.0	5	41.66
Widowed	2	2.0	2	16.66

Cont'd...

Cont'd...

Educational qualification				
Registered nursing cert (RN)	44	44.0	3	25.00
BNSc in Nursing	7	7.0	5	41.66
Total	100(100%)	100%	12(12%)	(100%)
PGD in Nursing	31	31.0	2	16.66
MSc in Nursing	18	18.0	2	16.66
Total	100(100%)	100%	12(12%)	(100%)
Position				
General Nurse	63	63.0	3	25.00
Nurse Midwife	11	11.0	3	25.00
Geriatric Nurse	0	0	0	0
Community health nurse	21	21.0	3	25.00
Others	5	5.0	3	25.00
Total	100(100%)	100%	12(12%)	(100%)
Working experience				
1-5	11	11.0	2	16.66
6-10	34	34.0	3	25.00
11-15	19	19.0	2	16.66
15-20	36	36.0	5	41.66

For the quantitative study, sex distribution shows that 69 per cent of females responded while for the qualitative study 75 per cent of the respondents were female. This shows in both studies, more females responded than males.

In this study, the highest qualification was a Ph.D. and the lowest was a registered nurse, (RN). The quantitative data had 44 (44.0%) of the nurses as Registered Nurses, 7 (7%) of the nurses have BNSc in Nursing, 31 (31%) of the respondents have their PGD in nursing and 18 (18.0%) have their MSc in nursing. In the qualitative data, 3 (25.00%) of the nurses are Registered Nurses, 5 (41.66%) of the nurses have BNSc in Nursing, 2 (16.66%) of the participants have their PGD in nursing and 2 (16.66%) have their MSc in nursing. The analysis above shows that with diversity in qualification in various specializations in nursing, diverse experience and expertise are likely to benefit from the study.

In the quantitative study, 63 (63%) of the respondents are general nurses, 11 (11%) of the nurses are nurse midwives, 21 (21.0%) are community health nurses, other nursing positions occupy 5 (5%) with no geriatric nurses with a majority of nurses being female, while for the qualitative study, 3 (25.00%) of the participants are general nurses, 3 (25.00%) of the nurses are nurse midwives, 3 (25.00%) are community health nurses, other nursing positions occupy 3 (25.00%) with no geriatric nurses. The study shows there are no trained geriatric nurses in the selected hospitals, just nurses who have taken care of elderly patients in their years of working experience who are willing to further their studies in geriatrics nursing. This implies that nurses should go into geriatric nursing to be effective in nursing care of the elderly, thereby bringing improvement to nurses' perspectives of elderly care.

PHASE 1.

Data analysis and presentation of quantitative aspect

Question 1:

What are the perspectives of nurses caring for the elderly in the selected hospitals in Yenagoa?

Table 2
Perspectives of nurses caring for the elderly.

S. N.	STATEMENTS	RESPONSES				Total
		<i>Strongly Agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly Disagree</i>	
1.	Caring for the Elderly is time-consuming care because so much patience is needed	59 (59%)	41 (41%)	0 (0%)	0 (0%)	100 (100%)
2.	Elderly care is a kind of care that should be pre-planned care.	0 (0%)	0 (0%)	49 (49%)	51 (51%)	100 (100%)
3.	Elderly patients need special attention and a friendly environment	50 (50%)	45 (45%)	5 (5%)	0 (0%)	100 (100%)
4.	Elderly care is safer in the hospital	2 (2%)	25 (25%)	2 (2%)	71 (71%)	100 (100%)
5.	Elderly care is safer when nurses who are trained in geriatrics care for them.	60 (60%)	31 (31%)	9 (9%)	0 (0%)	100 (100%)
Total mean		34.2 (34.2%)	28.4 (28.4%)	13 (13%)	24.4 (24.4%)	100 (100%)

N=100

The result displayed in table 2 on the perspectives of nurses caring for the elderly shows 59 per cent of the respondents strongly agree that caring for the elderly is time-consuming care because so much patience is needed. 51 per cent of the respondents went further to strongly disagree that Elderly care is a kind of care that should be pre-planned care. 50 per cent strongly agree that elderly patients need special attention and a friendly environment. 71per cent strongly disagree that elderly care is safer in the hospital while 60per cent of the respondents strongly agree that elderly care is safer when nurses who are trained in geriatrics care for the elderly.

Question 2

What knowledge do nurses have on elderly care in the selected hospitals in Yenagoa?

Table 3
knowledge nurses have on elderly care

S.N.	Statements	Responses		Total
		Yes	No	
1.	Elderly care is care provided only by geriatric nurses in nursing homes alone.	25 (25%)	75 (75%)	100 (100%)
2.	Elderly care is care provided only in the hospital by non-geriatrics.	8 (8%)	92 (92%)	100 (100%)
3.	Elderly care is complex care that needs only family members to care for their elderly relations.	37 (37%)	63 (63%)	100 (100%)
4.	Elderly care is care that allows nurses and relations care for the elderly in the nursing home alone.	30 (30%)	70 (70%)	100 (100%)
5.	Those who have the training in elderly care and geriatric nurses could take care of the elderly in the hospital and geriatric homes.	88 (88%)	12 (12%)	100 (100%)
	Total	37.6 (37.6%)	62.4 (62.4)	100 (100%)

The result displayed in table 3 on knowledge nurses on elderly care in the selected hospital shows that the majority of the respondents

75 (75%) disagree that elderly care is care provided only by geriatric nurses in nursing homes alone. The majority of the respondents 92 (92%) also disagree that elderly care is care provided only in the hospital by non-geriatrics. The majority of the respondents 63 (63%) also disagree that elderly care is complex care that needs only family members to care for their elderly relations. The majority of the respondents 70 (70%) disagree that elderly care is care that allows nurses and relations care for the elderly in the nursing home alone. While the result finally shows a majority of the respondents 88 (88%) believed that those who had the training in elderly care and geriatric nurses could take care of the elderly in hospitals and geriatric homes.

Question 3

What factors affect nurses' perspectives of elderly care in the selected hospitals in Yenagoa?

Table 4
Factors that affect nurses' perspectives of elderly care

S. N.	STATEMENTS	RESPONSES				Total
		<i>Strongly Agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly Disagree</i>	
1.	Unclean and tense Environmental can affect perspectives of nurses on elderly care.	41 (41%)	34 (34%)	25 (25%)	0 (0%)	100 (100%)
2.	The interest of the nurse presently caring for the elderly can affect the perspectives of nurses on elderly care.	56 (56%)	31 (31%)	13 (13%)	0 (0%)	100 (100%)
3.	The attitude of the elderly patients can affect the perspectives of nurses on elderly care.	6 (6%)	54 (54%)	6 (6%)	34 (34%)	100 (100%)
4.	Stress in the work setting can affect nurses' perception of elderly care.	53 (53%)	41 (41%)	6 (6%)	0 (0%)	100 (100%)
5.	Experience and Expectations of the nurse can affect the perspectives of nurses on elderly care.	41 (41%)	34 (34%)	25 (25%)	0 (0%)	100 (100%)
Total		39.4 (39.4%)	38.8 (38.8%)	15 (15%)	6.8 (6.8%)	100 (100%)

N = 100

The result displayed in table 4 on the factors that affect nurses' perspectives of elderly care in the selected hospitals in Yenagoa. A majority (41%) of the respondents strongly agree that unclean and tense Environmental can affect the perspectives of nurses on elderly care. The majority (56%) of the respondents strongly agree that the interest of the nurse presently caring for the elderly can affect nurses' perspectives of elderly care also majority (54%) of the respondents agree that the attitude of the elderly patient can affect nurses' perspectives of elderly care. The majority (53%) of the respondents also strongly agree on Stress in the work setting can affect nurses' perspectives of elderly care. Finally, the majority (56%) of the respondents strongly agree Experience and Expectations of the nurse can affect nurses' perspectives of elderly care.

Phase 2: Data Analyses and presentation of qualitative data.

To obtain information on nurses' perspectives of elderly care in the selected hospitals, thirteen (13) nurses were interviewed. Interviewees were both male and female nurses working in the selected hospitals. They were all Christians, residents in Yenagoa town, and attended to the elderly in their various wards, in the selected hospitals. The significance of this data is that the sex and religious background of participants does not influence their responses, given their focus was to relate the issue under review. Below is the presentation data with a literature control.

Theme 1: The perspectives of nurses caring for the elderly.

Theme 1 has two sub-themes.

Sub-theme 1: finding caring for the elderly interesting.

Three (3) of the participants find elderly care interesting because they feel the elderly people are good company, wonderful, and are people to be around. Others feel there is never a dull moment around them and some others feel they are loveable, lively, and full of wisdom. In most cases, elderly people feel lonely and need people around them to share stories of experiences had (Renata, *et al.*, 2014)

"..... Elderly care is not as bad as people think it is. As for me, Yes, I do find caring for the elderly interesting because the majority of them are a good company to keep"they love telling stories and encourage young ones like me to strive higher, especially the educated ones. (participant)

"..... Yes, I do find caring for the elderly interesting because they are good company and they always want someone to talk with, so there is never a dull moment with them" everyone will get old someday and the more you care for the elderly, doing it from your heart, the more you have the experience" (Participant)

This suggests that elderly people need a lot of care because of their feeling of loneliness, the elderly persons constantly need people around them especially family, and the most available.

Sub-theme 2: Elderly care Opportunity given to nurses.

Three of the participants would opt to care for the elderly if allowed to care for them. Elderly care opportunity according to Rajah,*et al.*, (2017), is a care which nurses who have been trained in geriatrics or nurses with elderly care experience give to the elderly patients. Rajah,*et al.*, (2017), further stated that it is important for nurses to be allowed to care for nurses to improve their perspectives of elderly care.

'...most of us just have this place to care for the elderly we see in the ward,. Yes I would if I have the opportunity to do so, I will care for the elderly because they need my care" (Participant)

".....Yes I would, I just need to be posted to the ward so I can care for them properly. I am feeling these patients are not having enough hands to care for them that is why they die quicker". (Participant)

".....Yes I would, I just need a good opportunity to do so." (Participant)

The finding above agrees with a study by Bamfo and Hagin (2011) that, the perspective of the possibility of being treated with respect and dignity is closely linked to how the caregivers cared for their elderly patients. In addition, elderly care in totality is also the paramount want of most of the people who participated.

Theme 2: Opinion elderly care.

This theme has 2 sub-themes:

Sub-theme 1: Exposure to more facts, information, and skills on elderly care.

Seven participants said in their statement exposed to more facts, information, and skills that improved care for the elderly through

their training as a nurse and are willing to apply this knowledge in their everyday care of the elderly at home and in other aspects of practice as well. This is in line with a study conducted by Burhans and Alligood, (2010) that though quality caregiving by nurses is important to patient safety, outcomes, meaningful improvements should be made, and further studies and facts about the elderly should be sought for, this will, in turn, bring to light more care options further for the elderly. Below are some comments by a participant.

"A little, as I did not study full geriatric course, just a section of my studies during my training, but I use personal experience to care for the elderly under my care. (Participant)"

Sub-theme 2: Improvement in elderly care.

"Yes. It has improved my knowledge, as I now know how to bath the elderly and help understand their basic needs, especially those who always want care and attention" (Participant).

"Yes.... I have a better understanding of elderly patients in the course of my care and I have better knowledge of the elderly" (Participant).

"...It exposed me to more facts; information and skills that improved my caring for the elderly and also I will apply this knowledge in my care at home as well" (Participant).

This goes along with Oyetunde, *et al.*, (2013) study, which stated that proper information on nursing care conditions of the elderly would surely improve elderly care in the hospitals and that nurses in the hospital setting should opt for the continued care of the elderly to improve on their care of the elderly.

Themes 3: Elements affecting 'nurses' perspectives of elderly care.

This theme has two sub-themes:

Five of the participants think that elderly care is important, unique, and also good if only the nurses who care for the elderly could have more patience, affection, understanding, and love intensively. Then care will be easy and interesting. This result agrees with Burhans and Alligood, (2010) who conducted a study on quality nursing care for practicing nurses. They also reported that though quality caregiving by nurses is important to the patient, love safety

and outcomes, meaningfully improvements can be made to keep elderly patients comfortable in the hospital Below are examples of responses some participants, gave:

Sub-theme 1: The understanding elderly need for care.

“elderly patients are fragile as they get older, their abilities become weakened and thus need proper care, there is the need for nurses to improve on their care for the elderly and focus more attention on elderly care because, with proper care, life will be elongated for them”. (Participant)

“...I think caring for the elderly is a good practice because it would make the elderly person feel loved and someday care will be reciprocated” (Participant)

Respondents are in line with a study conducted by Bamfo and Hagin (2011), which stated that fragile elderly people need lots of understanding in caring for them. Nurses in the hospital focus more on the treatment aspect and neglect care, if the nurses understand the needs of the elderly patient, this will, in turn, improve nurses' perspectives of elderly care.

Sub-theme 2: Attention and proper care for the elderly.

Giving attention to elderly persons is a way of getting to know what the elderly patients need and attending to their needs, which will also be a way of relaxing these elderly patients, and this can be a way in which nurses' perspectives of elderly care is expressed. Below are some comments by respondents:

“...in this part of the world, we neglect the elderly a lot, not like the developing world where the elderly persons have special care homes and units. The elderly persons here need more attention and care, I think elderly care is unique care as people who are old should be properly cared for, and given a lot of attention because of their fragile state of health at this stage in life. This care should be by family members or someone who is paid to care for the elderly”. (Participant)

“nurses should pay more attention to elderly care is to improve on the recent care approach given to the elderly....I think caring for the elderly is very good and needs a more technical approach because they have become fragile and need to be handled with a lot of care” (Participant)

This study is in line with a study by Bamfo and Hagin (2011) that attention given to the elderly by nurses, would further improve nurses' perspective of elderly care. The caregiving by nurses to the frail elderly will improve nurses' perspectives in the caregiving to the elderly by nurses in the hospital setting.

Integrating quantitative study into the qualitative study.

Research question 1.

Nurses in the hospital setting see the need for care homes and care facilities to be built or provided for the elderly patient as this is in congruence with the respondents' perspectives on the care of the elderly. They find caring for the elderly as a part of fulfilling duties. Generally, it is supposed that elderly patients are hospitalized for treatment and not proper care.

Research question 2.

Effective care of the elderly in most settings.

Gallagher, *et al.*, (2014) stated that nurses must have the fundamental knowledge/opinion of elderly care so that the technicalities in elderly care can be applied which the majority of the respondents and participants already have. The nurses in the study have basic nursing knowledge, the nurses also have positive opinions on elderly care, and recommendations were made for the nurses who are interested in elderly care to go for more studies.

Research question 3.

This result shows that attitude, interest, patience amongst others affects nurses' perspectives on elderly care in the selected hospitals, this was supported by Oyetunde, & Ofi., (2013). Therefore, nurses must be trained in geriatric nursing to be more grounded in elderly care.

Discussion

The result on the nurses' perspectives of elderly care shows that more than half of the respondents strongly agree that caring for the elderly is time-consuming care because so much patience is needed. About half of the respondents went further to strongly disagree that Elderly care is a kind of care that should be pre-planned care. Half of the respondents strongly agree that elderly patients need special

attention and a friendly environment. About three quarters strongly disagree that elderly care is safer in the hospital while a majority of the respondents strongly agree that elderly care is safer when nurses who are trained in geriatrics care for the elderly.

While in the qualitative study, the majority of the participants find elderly care interesting because they feel the elderly set of people are good company, wonderful, and are people to be around. Others feel there is never a dull moment around them and some others feel they are loveable, lively, and full of wisdom. Furthermore, the majority of the participants would opt to care for the elderly if allowed to care for them. In addition, most participants' culture does not support elderly care homes and institutionalized care because they believe the family is capable of caring for their relation who is an elder and will call a family who sends their elderly ward to a care home wicked or heartless children or family.

Research Questions 2:

To access the knowledge/opinion of nurses on elderly care in the selected hospitals in Yenagoa, Bayelsa State.

The result shows that three-quarters of the respondents disagree that elderly care is care provided only by geriatric nurses in nursing homes alone. The majority of the respondents disagree that elderly care is care provided only in the hospital by non-geriatrics. The majority of the respondents also disagree that elderly care is complex care that needs only family members to care for their elderly relations. While the result finally shows the majority of the respondents 88(88%) believed that those who have the training in elderly care and geriatric nurses could take care of the elderly in the hospital and geriatric homes.

The result above shows that most nurses know the care of the elderly in their training and working experience as a nurse, this is in line with a study conducted by Adibelli and Kilic. (2012), stating that as long as the nurse has an idea or knowledge on elderly care, improves nursing care of elderly patients and care can be greatly improved in hospitals.

While on the qualitative aspect of this study, most participants have been exposed to more facts, information, and skills that improved care for the elderly through their training as a nurse.

Research Questions 3:

The result displayed on the factors affecting nurses' perspectives found that the majority (41%) of the respondents strongly agree that unclean and tense Environmental can affect nurses' perspectives of elderly care. A majority (56%) of the respondents strongly agree that the interest of the nurse presently caring for the elderly can affect nurses' perspectives of elderly care also majority (54%) of the respondents agree that the attitude of the elderly patient can affect perspectives of nurses on elderly care. A majority (53%) of the respondents also strongly agree to stress in the work setting can affect nurses' perspectives of elderly care.

On the qualitative aspect of the study, the Majority of the participants think that elderly care is important, unique, and good if only the nurses that care for the elderly could have more understanding, patience, affection, and love them intensively. Then care will be easy and interesting.

Conclusion

Elderly care in the hospitals needs a lot of attention in the study area with several factors working against the elderly care by nurses. The study shows that nurses have a positive perspective of elderly care. However, there are several challenges especially inadequate nursing staff, poor funding from the part of the government, growing population of the elderly, lack of special care center in Bayelsa State for the elderly, poor health care policy, and lack of specialized training for gerontological nursing etc. Based on present findings it is suggested that the development of courses and in-service training programs should be conducted to maintain the efficient performance of nurses willing to go for geriatric study and also for nurses previously trained in elderly care.

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Dance Movement Therapy for the Elderly: A Holistic Approach

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ABSTRACT

The purpose of this qualitative study was to find out the therapeutic usefulness and influence of Dance and Movement Therapy (DMT) on senior citizens (n = 10, 60 years and older, females) residing in old age homes. The DMT treatments lasted 36 hours over 18 sessions and were led by professionally trained facilitators. The movement activities in the sessions focused on increasing physical fitness and general wellbeing, improving social interaction and self-esteem. Thematic analysis was used for the processing of data, gathered using unstructured interviews and coding sheets. In the physical, spatial, cognitive, emotional, and social paradigms, progressive alterations were observed. Physical well-being, social relationships, psychological health, and coping were among the significant themes that emerged. Positive movement experiences increased one's connection to one's body and self. The group DMT sessions provided a therapeutic chance to express feelings with others, resulting in pleasant communal experiences, social empowerment, and improved coping methods for overcoming loneliness. Qualitative data analysis reveals that DMT improves the elderly's quality of life, increases their engagement in activities, and contributes to a sense of meaning, purpose, and energy in life. The implications for future intervention programmes are examined to integrate movement therapy as part of a holistic approach to working with the elderly.

Keywords: Dance Movement Therapy, Elderly, Holistic intervention

Dance movement therapy is defined by the American Dance Therapy Association (ADTA), as the psychotherapeutic use of movement to increase an individual's emotional, social, cognitive, and physical integration. DMT (dance movement therapy) is a mind-body intervention that combines physical training with psychosocial therapeutic elements. Dance movement therapy (DMT), as a resource-oriented treatment approach, is becoming increasingly significant because it preserves the dignity of the elderly, respects their particular requirements, and improves social engagement. Koch, *et al.*, (2014) conducted a meta-analytic review of 23 pieces of research and found that DMT had an impact on depression, quality of life, positivity of mood, and emotional health in varied populations. DMT emphasises the mind-body connection in particular: "The utilisation of dance movements as a therapeutic or healing therapy is rooted in the belief that the body and the mind are inextricably linked" (Levy, 2005). DMT is transferable to any culture due to the universality of mental illness and dance and movement; as a result, the concepts and fundamentals of DMT have been adapted and practiced all over the world.

Successful ageing is a concept that must be promoted and nurtured. It is crucial to understand older people's physiological and psychological requirements and how they might be met to promote healthy ageing and increase the quality of life. As the population of people over the age of 65 continues to rise, healthy ageing is becoming increasingly important. Physical health, personality, degree of intellectual functioning, availability of support systems, adequacy of economic resources, and the ability to fulfill social duties are all elements that influence how people approach old age. Isolation, physical inertia, and loss of independence are some of the most significant issues that the elderly encounter. Rooms full of elders reclining for hours in front of a television, shoulders hunched, head dropped, napping the day away is not uncommon in long-term care settings. While it is vital to acknowledge the natural slowing down and physical decline that comes with ageing, it is also useful to break up such stagnation with activities that foster meaningful involvement on occasion. Old age may present a once-

in-a-lifetime opportunity to engage in artistic hobbies that allow for self-expression and fulfillment.

Physical activity on the part of the elderly is crucial. The individual's homeostasis is maintained by a complicated set of internal systems. As we get older, it takes more effort for our bodies to get back to normal after periods of stress and activity (DeVries, 1979). Dance/movement therapy provides an accessible and highly suited channel for the elderly to engage in constant physical activity. It can preserve exercise levels by facilitating improved mobility of bodily parts and can help establish a realistic body image and deepen self-awareness, offering a physical foundation for identity. It may also provide some structural body alignment corrections and pain relief at stress spots where chronic tensions and inappropriate weight distribution have accumulated (Cruz –Ferreira,*et al.*, 2015). Dance/movement therapy may improve sensory perceptions while also stimulating the respiratory, circulatory, and skeletal systems. Muscle tone, balance and coordination, and spatial orientation can all benefit from it. Dance motions, according to research, activate numerous brain functions at the same time: kinesthetic, logical, melodic, and emotional. This sort of exercise necessitates the simultaneous use of mental, physical, and emotional strength, resulting in a full-body and soul workout. Senior individuals were placed in a 21-year study (Cross,*et al.*, 2012) to examine if any physical or cognitive recreational exercise influenced mental acuity. Dancing regularly was the activity with the highest proportion of dementia prevention (76 percent). It had the largest risk decrease of any cognitive or physical exercise studied. This is because, rather than engaging one section of the brain at a time, dance therapy stimulates numerous areas at the same time.

Multiple loss can be a prominent topic in the experience of growing older in terms of the psychological components of ageing (Butler, 1969). These losses can include the death of a spouse, friends, or relatives; the deterioration of physical health and the impending death of a loved one; and the loss of social position, money, and participation. The elderly have a strong desire to express their sentiments over such losses and rediscover a sense

of purpose in life. Dance and movement therapy can help people create meaningful psychological experiences. It provides an authentic sensation of activity in the present, boosting the elderly's ability to take charge. Spontaneous movement expressions might provide older folks a sense of aliveness and vigour, isolation may be lessened, and self-confidence and self-esteem may be enhanced.

The dance/movement therapy group allows the elderly to express and share their feelings and experiences, combining nonverbal and verbal communication (Dunphy, *et al.*, 2019). The necessity to build and develop a primary contact with the older person becomes increasingly important as the treatment process progresses.

Dance movement therapy sessions for the elderly consist of three key components. The first area of attention is physical fitness, which includes exercises that help elderly people enhance their mobility, blood circulation, stamina, as well as relief from tension and stress, improve breathing, and positively impact their overall health. These workouts are largely focused on improving an individual's physical well-being rather than their mental well-being. The second set of exercises that are frequently seen in nursing homes comprises some 'creative movement,' which entails activities performed to music to enhance spontaneity, boosting bodily awareness, letting go, and improving social contact, as these are usually done in groups. Finally, DMT-based activities employ a multi-modal approach, including dance, movement, visuals, storytelling, drama, and so on. These activities aren't only about physical fitness; they're also about a more holistic approach to growth. These exercises entail giving movement significance and expressing oneself via movement. They elicit emotional responses, cathartic expressions of one's inner state, and make social interactions easier. Movement-based dance lessons enhance gross motor skills, relieve anxiety, improve functional fitness, physical activity, mental state, quality of life, and alleviate depression (Strassel, J. K., *et al.*, 2011). These activities are not the main focus of the sessions in this case; rather, the focus is on creating a therapeutic and secure environment in which these elderly people can find a more holistic manner of enhancing their physical, mental, psychological, emotional, and spiritual well-being.

In India, there is a scarcity of studies on the use of movement therapy in the elderly. The current study's goal was to investigate the therapeutic usefulness and influence of Dance and Movement Therapy (DMT) on senior citizens. The argument was that dance/movement therapy can help prevent and treat illness in the elderly, as well as function as a motivator for them to reach their full potential throughout their lives.

Method

Sample

The participants were a cross-section of ten female senior citizens (60 and older) living in an old age home. Participants were 60 to 70 years old ($M = 65.12$; $SD = 2.17$). Cognitive impairment, physical handicap, and psychiatric conditions were used as exclusion criteria for sampling.

Procedure

The study used a qualitative research approach that included unstructured interviews and coding sheets. The DMT treatments lasted 36 hours over 18 sessions and were led by professionally trained facilitators. After each session, a coding sheet was utilised to assess all of the participants on specific categories such as physical, spatial, emotional, and cognitive variables. The participants were evaluated in a group and individually, where they had been observed for 18 sessions in a group and 13 sessions individually.

The participants were interviewed about the sessions which had been conducted. The focus of the interviews was on the sessions that made them feel, what they experienced during the sessions, whether there were any changes as they progressed through the sessions and whether they would participate in something similar again. Data saturation occurred after interviewing approximately 10 senior citizens. Participants were given complete information regarding the interview method and the time commitment required for this study, and they gave their informed consent. The interviews were performed to have a better grasp of the participants' perspectives on DMT. The participants

were evaluated based on the coding sheet and the interviews after all of the sessions were completed.

Analysis of Data

The coding sheets were compared across the group sessions to evaluate change across categories. The observational notes in each of the sessions recording the changes in the physical, spatial, emotional, cognitive, and social domains were analysed in conjunction with the coding sheets.

Thematic analysis was done using Grounded Theory (Strauss & Corbin, 1990). A thematic content analysis of the interview transcripts was done with a low degree of abstraction to evaluate the qualitative components of this study. The investigator created codes out of words and phrases. For recurring and salient codes, definitions were created. Two researchers coded transcripts and met again to compare and contrast their initial findings to finalise codes. Finally, themes emerged that identified patterns in individuals' accounts of their feelings, perceptions, and understandings.

Results and Discussion

The purpose of this study was to explore the therapeutic usefulness and impact of Dance and Movement Therapy (DMT) on senior citizens in the community setting of an old age home. The qualitative inquiry aimed at exploring the participant's experiences around movement sessions

The participants were individuals who are simply aged and were experiencing everything that comes with growing old. These are individuals who are going through the usual stages of ageing, such as losing a spouse or friends, retiring, losing physical mobility, or dealing with other emotional challenges in their personal lives. Individuals' general physical well-being, social engagement, and emotional wellbeing were therefore prioritized in the study.

The therapy improved the elderly's engagement in group activities and increased their body movement, indicating a reasonable amount of progress in specific elements such as physical, emotional, spatial, cognitive, and social characteristics.

Analysis of the coding sheet for the group

From the first to the 18th session, the participant's body language, memory, and sequencing, response to instructions, social interaction, eye contact, verbal articulation, physical touch, awareness of each other, and inventiveness all exhibited a progressive transition from low to good/high. From the first to the 18th session, the participants' spatial awareness, energy level, group coordination, motivation/interest, listening skills, engagement, adaptability, and physical stamina improved somewhat from moderate to good. In the domain of leadership, the group demonstrated a progressive change from low to high.

Table 1 .

CODING SHEET for GROUP PARTICIPATION (Average Scores)

1 - Poor, 2 - Low, 3 - Moderate, 4 - Good, 5 - High.

<i>Categories</i>	<i>Session1 scores</i>	<i>Session18 scores</i>
Body Language	2	4
Memory And Sequencing	2	4
Response To Instructions	2	4
Awareness Of Each Other	2	2
Social Interaction	2	5
Eye Contact	2	4
Verbal Articulation	2	4
Physical Contact	2	4
Creativity	2	4
Spatial Awareness	3	4
Energy Level	3	4
Group Coordination	3	4
Motivation/Interest	3	5
Listening Skills	3	4
Participation	3	5
Adaptability	3	4
Physical Stamina	3	5
Leadership	1	5

Table 2.

CODING SHEET for Individual Observations (Average Scores)

1- Poor,2- Low,3 - Moderate,4 - Good,5 - High.

<i>Domains</i>	<i>Session1 scores</i>	<i>Session18 scores</i>
Physical Domain Bodily Flexibility, Fine Motor Skills, Ability to Relax and Breathing Patterns	3	4
Spatial Domain Level Of Awareness and Exploration of Their Own and Others' Personal Space	4	5
Emotional Domain Self-Confidence, Range of Emotional Expression, Acceptance and Tolerance of Peers' Ideas, Emotions, and Movements	3	4
Cognitive Domain Responses To Guided Imagery, Verbal and Physical Simultaneity, Capacity to Solve Movement Puzzles, Creativity and Imagination	3	5
Social Domain Leadership Skills, Communication Clarity	1	5

Observational notes on the physical, spatial, emotional, social, and cognitive domains.

Throughout the sessions, the *physical domains* of bodily flexibility, fine motor skills, ability to relax, and breathing patterns were of a moderate level. There was a gradual transition from moderate to good.

The *spatial factor* paradigm assessed how the individual explored the space around her and also understanding of others' space. The participants demonstrated a high level of awareness of their own and others' personal space. The participants partially investigated the vertical, horizontal, sagittal, and lateral planes. There was also an outward movement flow among the participants.

The *emotional paradigm* measured trust in the therapist and peers, self-esteem, self-confidence, and motivation, as well as

emotional range, body image, acceptance and tolerance of peers’ ideas/movements, and impulse control. In terms of self-confidence, range of emotional expression, acceptance, and tolerance of peers’ ideas, emotions, and movements, the results showed a gradual transition from moderate to good.

The *cognitive domain* assessed the higher-order mental processing of the individual. The cognitive paradigm, which includes responses to guided imagery, verbal and physical simultaneity, capacity to solve movement puzzles, creativity, and imagination, had shifted from moderate to high in the participants.

The *domain of social factors* assessed the individual’s social awareness. The participants demonstrated a progressive shift in leadership skills from low to high, as well as a shift in communication clarity from moderate to good.

Data analysis of the interviews focused on the development of themes and relationships so that the essence of the experiences that participants had in the sessions of DMT was revealed. Physical well-being, social interactions, psychological health, and coping were the three key themes that emerged. The results of the coding sheets matched the findings of the interview, which revealed that the activities enhanced togetherness (social connection), creativity (since the activities forced them to think and do things differently), memory, and physical stamina (as they feel energetic and fresh by doing the activities).

Table 3.

Identified Themes

<i>Themes</i>	<i>Quotations</i>
Physical Well Being	<i>After the session, I feel very energetic, happy, and playful (Participant 1)</i>
Social Interactions	<i>“I feel a sense of oneness and togetherness, and it’s made me want to try new things and participate in other activities.” (Participant 4)</i>
Psychological Health	<i>“We are asked to concentrate on the music and our actions when we dance. I forget about all my worries at that time.” (Participant 2)</i>

Physical well-being,

All of the participants had increased their physical activity. Increased physical activity referred not just to increasing strength and endurance, but also to engaging in beneficial stretching. Such motions required greater flexibility and limberness from each participant, as well as the ability to move their bodies in ways they were not accustomed to. A positive experience of movement improved connection to the body and oneself. Participants reported that *"After the session, I feel very energetic, happy and playful..."*(Participant 1) and *"When I am dancing with the therapist, I feel very light and I forget about my knee pain through the session"*(Participant 5).

DMT interventions supported a reduction in physical limitations. Focussing on the whole body helped to update self-image and strengthened personal boundaries. DMT thus appeared to promote movement-based psychoeducation, an emphasis on pleasant experiences, the development of personal abilities, and the expansion of pain-coping mechanisms, lending support to earlier research that movement-dance lessons increased mobility, motor-cognitive function, and gait (Butler et al., 2016).

Social Relationships

This theme focused on the participants' feelings of loneliness, as well as the purpose and determination that the dancing intervention generated. The reality of older adults' struggles with loneliness, motivation, and the need to be socially active with others became apparent through this theme. Dancing with others, forming relationships, and offering a scheduled activity that motivated them to join the sessions were all examples of increased social interaction.

The group DMT sessions provided a therapeutic opportunity to express feelings with others, resulting in positive community experiences and social empowerment. Others in the classroom encouraged participants in various ways, as reported by the participants. Because of the prevalence of social isolation, the development of friendships was critical. The movement-dance sessions provided not only a physical and emotional growth environment for the participants but also a place for them to make friends and participate in an activity that gave them a sense of belonging.

Participants said that *"In one activity, we were instructed to softly massage the hand of our companion. I felt quite comfortable like as if we share a relationship"*(Participant 3), *"I feel a sense of oneness and togetherness, and it's made me want to try new things and participate in other activities."* (Participant 4), *"I've noticed that I've changed and that I've started talking to people I'd never talk to before. This occurred because we were forced to participate in activities in groups."*(Participant 1). DMT can help people cope with the loss of relationships by providing engagement. DMT promotes pleasant community interactions and assists in overcoming loneliness and regaining confidence in networking. The therapist encourages social networking and serves as a contact point.

"Dancing together reminded me of the moments when I used to dance as a kid." I felt like I could accomplish it after learning easy steps."(Participant 6) Elderly persons experience feelings of being a burden to and reliant on others, as well as a sense of not being needed, of no longer participating in others' lives, and of contemplating about the meaning of life. Participants reported that DMT made them experience a sense of belonging and improvisation made them feel confident in their abilities.

The therapist in her observations notes *"It's difficult not to smile while watching M, who is 64 years old. The joy she exudes when dancing is contagious: her energy immediately changes the mood of the room, causing others to become more aware. M's dance has an impact on everyone! When she dances, the other occupants come alive and look at her with a brightened expression. Some others also joined her."*M's dancing appears to help the group through resonance, which Young describes as "a mutual sense of aliveness, breath, and a constant rhythmic interconnectedness...a vibration or throbbing energy" (Young, 2017). According to a research on mirror neurons, when we see someone move, our brains fire the identical neural pathways as if we were executing the activity ourselves. M's dance is a gift that allows others who watch it to feel as though they are experiencing her motions for the first time.

Psychological Health and Coping

The death of a loved one can cause loneliness and social withdrawal in the elderly. Participants shared how the group

movement sessions helped them to overcome the sense of loneliness and nurture the bonding with their fellow inmates

"The movement games forced us to interact with one another, and it felt good to be in a group."(Participant 2). When these sessions take place, I feel less lonely." (Participant 8).

Being in the moment was one of the themes that emerged. This theme expands on the participants' understanding of how the movement-dance lessons taught them to be present at the moment. Participants said the emphasis was on simply focusing on the dance and the teacher's instructions, which led to them focusing on the present and not thinking about anything else. The movement-dance lessons were widely regarded as providing an organised outlet for stress relief as well as a different pastime from simply watching television throughout the day. Participants stated that the seminars assisted them in focusing on something productive rather than watching television., *"We are asked to concentrate on the music and our actions when we dance. I forget about all my worries at that time."(Participant 2). "Dancing led to good recollections (here, a couple of dances with the therapist) brought back memories of dancing with my husband. As a result, I came in a bright spirit and intend to continue dance and yoga classes at the center."(Participant 7).*

The therapist notes *"One of the participants came to feel she could share her despair and let her hands and head flop in passive weight,"* She was then encouraged to use her hands to convey more positive emotions, such as stroking and holding herself. She began to build a sense of self-worth as a result of these basic actions, and she was able to open herself up to the other members of the group. They showed their support by rubbing their hands together and giving her good verbal attention, as well as praise for her bravery in voicing her sentiments."

As a result, DMT encourages and improves coping skills for overcoming loneliness. The focus is moved from the negative parts of one's existence to the positive aspects of one's existence, awareness changes to the present, resulting in freedom and calmness. To summarise, DMT tends to assist clients in discovering new hobbies and validating their sensations and views of reality. This has a

revitalising effect and contributes to a sense of purpose and meaning in one's life.

DMT programmes not only bring people together, but they also give a safe and comfortable environment in which to express oneself and engage in activities. They can regain their integrity, body image, ego, and most significantly, as previously mentioned, working in a group provides them a sense of belonging, purpose, and acceptance that they desperately need (Stockley 1992). The new study backs up previous research that shows that dance/movement therapy can improve mood, cognitive function, and sensorimotor competence in the elderly (Kshtriya,*et al.*, 2015).

Conclusion

The findings suggest that movement-dance lessons help older persons reduce stress and boost positive effects, promote physical activity, and foster a sense of belonging. As a result, caretakers must understand how to include both physical and mental health supports while assisting older persons. This study lays the groundwork for future research on the impact of group-based movement-dance classes on older adults' mood and stress levels, socialisation, and the physical body.

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State-Trait Anxiety and Self-efficacy of the Retired College Teachers in Early and Late Phases

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ABSTRACT

The purpose of the present study was to assess the state-trait anxiety and self-efficacy of 120 retired (60 in the early phase, 60 in the late phase) college teachers, ages varying from 60 to 70 years. State-Trait Anxiety Inventory (Spielberger, 1983) and General Self-efficacy Scale (Schwarzer, R., & Jerusalem, M., 1995) were administered to the subjects individually. The Leven's F test for Equality of Variances, 't-test' and Pearson's coefficient of correlation were applied for statistical analysis. Results revealed that there is no significant difference in state-trait anxiety and self-efficacy among retired teachers in the early and late phases of retirement. It is also found that there is a significant correlation between State-Trait Anxiety and Self Efficacy.

Keywords: Retirement, State-trait Anxiety, Self-efficacy

Retirement is the termination or withdrawal of employment after having finished an active working life. Most of the employees retire at the age of 60 years. This is based on the fact that the person is not

sufficiently active physically and mentally after the age of 60 years. Transition to retirement is a meaningful phase in older adulthood and marks the beginning of the 'third age' (Laslett, 1991). Like all major life events, the transition to retirement comes with a few problems. Retirement can release one from an unfavourable work environment and work-related stress, thus resulting in improved well-being (Wang,*et al.*, 2011) but for many retirees reaching retirement age and leaving active work brings a change of daily routines and creates uncertainty. It may lead to feelings of social exclusion, loss of perceived importance of one's contributions to society, and thus to a deterioration of well-being. Many retirees find they miss the sense of identity, purpose, and value their careers provided for so many years.

Retirement was viewed as a stressful transition disrupting an individual's established routines with negative consequences for health. Fretz,*et al.*, (1989) found retirement was found to be the main predictor of anxiety and depression. Physical illness may increase the risk of anxiety and depression and vice versa (Georgantas, *et al.*, 2020). Among psychiatric conditions depression, anxiety and stress have been implicated as the most common problems faced by people retiring early from their jobs (Khan Farooq, 2014).

Some of the causes of anxiety according to Ode (2004) are inadequate funding, challenges in managing mental health, the challenge of managing a new and lower social status, inadequate planning for retirement, difficulty in time management, total dependence on present pension, the problem of securing residential accommodation, ignorance of what to do with pension money, the attitude of friends and family, and the challenges of sudden retirement, etc.

Self-efficacy has been described as a perception about whether one is capable of producing the desired effect or accomplishing a certain level of performance (Bandura, 1986). Taylor-Carter and Cook (1995) have defined retirement self-efficacy as the belief that one has the knowledge and skills required to deal with the changes related to retirement. Peila Shuster (2011) defined self-efficacy as one's belief or confidence in his/her ability to successfully negotiate the retirement

transition and find purposeful and affirmative life engagement upon entering this new life chapter. Self-efficacy consists of self-perceptions of the extent to which one will be able to successfully handle the specific challenges and tasks implied by the new situation of retirement (Van Solinge and Henkens, 2005).

Review of Literature

Fretz, *et al.*, (1989) in their study found that participants who developed a retirement plan were knowledgeable about retirement and had a more positive attitude towards retirement. They had a higher level of self-efficacy and lower depression and anxiety levels.

Georgantas, *et al.*, (2020) studied anxiety and depression in navy veterans after retirement. Spielberger's STAI and BDI were used for anxiety and depression assessment. It was found that the presence of a serious health problem was an independent predictor of both anxiety and depression. Inversely, the stability in terms of retirement choice was negatively related to depression, while the development of new interests and activities after retirement was negatively related to both anxiety and depression.

Kypraiou, *et al.*, (2017) found army officers who retired because of family problems had significantly more state and trait anxiety, and those who were satisfied with their professional evolution as well as with changes in everyday life after retirement had lower mean scores in both anxiety subscales.

Singleton, *et al.*, (2003) in their study 'The impact of conventional retirement on mental health found that in the 50-74 years age group, the prevalence of depression and anxiety was dramatically lower among men at or over 65 (5%) compared to those aged 50-64 (14.5%) but not in women.

Retirement was found to decrease distress symptoms specifically among workers from high-stress jobs (Wheaton, 1990). Lizaso Elgarresta, *et al.*, (2009) analyses the relationships between retirement types and concluded that retirement is not associated with anxiety and depression, although poor psychological health was associated with retirement due to physical ill-health.

Retirement anxiety is mediated through death anxiety. Anxious anticipation of retirement could imply that the individual perceives it as an 'end' resulting in greater death saliency and death anxiety which are related to poor mental health (Segel-Karpas, & Bergman, 2020).

In terms of the retirement process, self-efficacy probably affects feelings about the upcoming work exit (Fretz, *et al.*, 1989) and motivation to address the transition (Taylor & Shore, 1995) as well as assessments of the positive or negative nature of the changes associated with the end of one's working life.

Studies of personal adjustment to retirement have shown that self-efficacy influences retirees' feelings about retirement and mental health, which are positively associated with life satisfaction and negatively associated with anxiety and depression (Fretz, *et al.*, 1989).

Self-efficacy or mastery and sense of personal control influences retirement transition and adjustment (Topa and Alcover, 2015).

Purpose of the study

Although most people eventually make a satisfactory adjustment to retirement, some people experience difficulties in managing the transition. So this study helps to understand the level of anxiety and self-efficacy of the retired college teachers in early and late phases.

Objectives of the study

1. To study the level of state-trait anxiety and self-efficacy of the retired college teachers in early and late phases.
2. To examine the correlation between State-Trait Anxiety and Self Efficacy of retired college teachers in early and late phases.

Hypotheses

1. There will be no significant difference in the level of state anxiety of the retired college teachers in the early and late phases.
2. There will be no significant difference in the level of trait anxiety of the retired college teachers in the early and late phases.

3. There will be no significant difference in self-efficacy of the retired college teachers in the early and late phases.
4. There will be no significant correlation between State Anxiety and Self Efficacy of retired college teachers in early and late phases.
5. There will be no significant correlation between Trait Anxiety and Self Efficacy of retired college teachers in early and late phases.

Method

Sample

The present study sample consisted of 120 retired college teachers of government and private aided colleges affiliated to Karnataka University, Dharwad and Rani Chennamma University, Belagavi of Karnataka state, India. The sample is selected based on the purposive sampling technique. The retired college teachers were grouped into two: 1. The early phase of retirement – The college teachers who had been retired for up to 5 years i.e. 60-65 years. 2. Late phase of retirement - The college teachers who had been retired for up to 6-10 years i.e. 65-70 years.

Retired College Teachers		
Early phase N = 60	Late phase N = 60	Total 120

Research tools used

1. The State-Trait Anxiety Inventory by Spielberger, Gorsuch, Luchene, Vagg& Jacobs (1983) is a 40-item self-completed questionnaire that aims to assess separately state anxiety (a temporary state influenced by the current situation where the respondent notes how he/she feels right now at this moment) and trait anxiety (a general propensity to be anxious where the respondent notes how he/she feels “generally”) with 20 items each. The total score for each sub-scale of this inventory lies between 20 – 80. High scores indicate greater anxiety and vice-versa. Internal consistency coefficients for this scale are 0.86 to 0.95 and test-retest reliability coefficients have ranged from

0.65 to 0.75 over a two-month interval. Construct and concurrent validity is satisfactory.

2.General Self-efficacy Scale by Schwarzer and Jerusalem (1995) is a ten-item psychometric scale that measures optimistic self-beliefs to cope with a variety of difficult demands in life. The total score of this scale ranges between 10 – 40. A higher score indicates more self-efficacy. Cronbach’s alphas for this scale is between 0.76 – 0.90. Criterion-related validity is satisfactory.

Procedure

A survey method was used to collect data. The rating scales were administered to the retired college teachers and responses were collected. Only the willing participants were taken for the study after obtaining their informed consent and confidentiality was assured to the respondents.

Statistical analysis

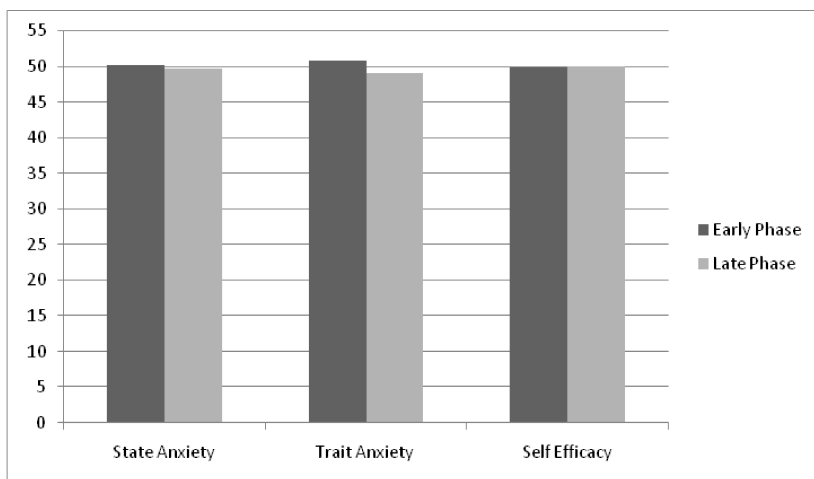
After scoring the responses, statistical analysis was carried out. The analysis included descriptive statistics, Levene’s test for equality of variance, ‘t-test, and Pearson’s coefficient of correlation.

Result and Discussion

Table I

shows mean, standard deviation, and standard error mean of state anxiety, trait anxiety, and self-efficacy of retired college teachers in early and late phases.

	Group	N	Mean	Standard Deviation	Standard Error Mean
State Anxiety	Early	60	50.307	9.663	1.248
	Late	60	49.693	10.479	1.353
Trait Anxiety	Early	60	50.935	10.018	1.293
	Late	60	49.065	10.063	1.299
Self-efficacy	Early	60	49.893	10.711	1.383
	Late	60	50.107	9.415	1.215



Graph I

From Table I and Graph I, it was found that there is not much difference in mean and S.D. of State Anxiety, Trait Anxiety, and Self Efficacy in early and late phases. The mean value of State Anxiety in the early phase is 50.307, S.D. = 9.663 and mean = 49.693, S.D. = 10.479 in the late phase. Similarly, mean = 50.935, S.D. = 10.018 for Trait Anxiety in an early phase and mean = 49.065, S.D. = 10.063 in the late phase. Thus, retired college teachers who are in the early phase have slightly more State-Trait Anxiety compared to the teachers who are in the late phase. The mean value of Self Efficacy is 49.893 and S.D. = 10.711 in the early phase. Mean = 50.107, S.D. = 9.415 in the late phase. Thus, retired college teachers who are in the late phase have slightly more Self Efficacy compared to the teachers in the early phase. But the difference between these scores is not statistically significant. Pre and post-retirement financial planning leads to a greater sense of control and increases well-being. Retired teachers have not reported higher State-Trait Anxiety maybe because they are getting good retirement benefits including their monthly pension. Salami, (2010) in his study of retired teachers argues that the retirement status, adequate financial situation, adequate physical health, high activity level, and high social support are related to lower anxiety and depression. There is no greater amount of State-Trait Anxiety, hence a higher level of Self-Efficacy is seen. Those who are satisfied as retirees

report lower State-Trait Anxiety as compared to those who were dissatisfied (Georgantas, et al., 2020). Employees who have less retirement anxiety have higher levels of Self-Efficacy (Fretz, et al., 1989). The present findings are in tune with the findings of Fretz, et al., (1989); and Georgantas et al., (2020).

Table II

Shows Independent Samples test results

<i>Independent Samples Test</i>										
		<i>Levene's test for equality of variances</i>				<i>t-test for equality of means</i>			<i>95% confidence interval of the difference</i>	
		<i>F</i>	<i>Sig.</i>	<i>t</i>	<i>df</i>	<i>Sig. (2tailed)</i>	<i>Mean difference</i>	<i>Standard error difference</i>	<i>Lower</i>	<i>Upper</i>
State Anxiety	Equal variances	0.178	0.674	0.334	118	0.739	0.615	1.840	-3.030	4.259
	Equal variances not assumed			0.334	117.232	0.739	0.615	1.840	-3.030	4.259
Trait Anxiety	Equal variances assumed	0.158	0.691	1.02	118	0.31	1.870	1.833	-1.760	5.500
	Equal variances not assumed			1.02	117.998	0.31	1.870	1.833	-1.760	5.500
Self-efficacy	Equal variances assumed	0.221	0.639	-0.116	118	0.908	-0.214	1.841	-3.859	3.432
	Equal variances not assumed			-0.116	116.09	0.908	-0.214	1.841	-3.860	3.433

From the above Table II, the F value of Levene's test is 0.178 for State Anxiety with a sig. value of 0.674, $t(118) = 0.334$, $p = 0.739 > .05$. We retain the null hypothesis that there is no significant difference in the State Anxiety level of retired college teachers between the early and late phases. Therefore, the first hypothesis has been proved. F value for Trait Anxiety is 0.158 with a sig. value of 0.691, $t(118) = 1.02$, $p = 0.31 > .05$. This shows that there is no significant difference in Trait Anxiety of retired teachers between the early and late phases of retirement. Hence, hypothesis 2 is accepted. For Self-Efficacy, the F value is 0.221 with a sig. value of 0.639, $t(118) = -0.116$, $p = 0.908 > .05$. Hence, there is no significant difference in the level of Self-Efficacy of

retired teachers between the early and late phases of retirement. So we can retain the third hypothesis. The retired teachers selected for the study are UGC teachers. So they get a good amount of pension benefits. Higher income promotes better retirement experiences (Atchley, 1976; Price and Joo, 2005). Increased leisure time, opportunity to pursue personal interests and hobbies, removal of work-related mental strain, etc. contribute to better adjustments in early and late phases of retirement.

Table III

shows the correlation between State Anxiety and Self-Efficacy of retired college teachers in early and late phases.

Variable		Correlation	P-value	Remarks
State Anxiety X	Early phase (N = 60)	-0.4198	.000862	Significant at $p < .05$
Self-Efficacy	Late phase (N = 60)	-0.3335	.009328	Significant at $p < .05$

From the above Table III, the correlation between State Anxiety and Self-Efficacy in early phase $R = -0.4198$ and late phase $R = -0.3335$. Although there is a negative correlation, the relationship between State Anxiety and Self-Efficacy is weak. $p < .05$ which is significant. So there is a significant correlation between State Anxiety and Self-Efficacy among retired teachers in early and late phases. Hence the fourth hypothesis stating that there will be no significant correlation between State Anxiety and Self-Efficacy has been rejected. It suggests that there is a significant correlation between State Anxiety and Self-Efficacy.

Table IV

shows the correlation between Trait Anxiety and Self-Efficacy of retired college teachers in early and late phases.

Variable		Correlation	P-value	Remarks
Trait Anxiety X	Early phase (N = 60)	-0.5497	.00001	Significant at $p < .05$
Self-Efficacy	Late phase (N = 60)	-0.2934	.02309	Significant at $p < .05$

From Table IV the correlation between Trait Anxiety and Self-Efficacy $R = -0.5497$ in the early phase which is a moderate negative correlation that means there is a tendency for high Trait Anxiety scores to go with low Self-Efficacy score and vice-versa. $R = -0.2934$ in the late phase, which is a weak correlation. The p values are significant at the .05 level. Hence, the fifth hypothesis stating that there will be no significant correlation between Trait Anxiety and Self-Efficacy has been rejected. It shows that there is a significant correlation between Trait Anxiety and Self-Efficacy.

Suggestions

A more representative and large sample could be employed. Large surveys and quantitative analysis with more relevant variables would give precise results. Future works could be the longitudinal or experimental approach to facilitate more causal evaluations. Comparative studies could be made between working and retired college teachers.

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Nutritional Status of Old-aged Population of Midnapore (West Bengal)

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ABSTRACT

The present cross-sectional, ex-post-facto study tries to explore the nutritional status of the 200 elderly persons (Males=90 and females=110) of Midnapore Town. In this study, a structured interview schedule and Anthropometric measurements were used to collect the data. The findings of the study revealed that more female participants were found underweight (29.09 percent) as compared to male participants (21.11 percent). Though overweight was slightly higher among males (16.7 percent) compared to female participants (14.5 percent), obesity was higher among females. A statistically significant association with nutritional status and differences in gender of participants ($\chi^2=6.939$; $p>0.05$), Occupational status ($\chi^2=15.553$; $p>0.05$), and educational status of the participants ($\chi^2=15.415$; $p>0.05$) Was also noticed. It was also found from the present findings that female participants were more malnourished (2.23 times) compared to male participants. Based on these findings, it may be concluded that the nutritional status of the participants was not very good and needed social and familial support and care.

Keywords: Elderly, Socio-economy, BMI, Malnourishment, Underweight

The elderly population is more prone to age-related disease, physical and functional impairment, and inability, which sometimes makes it difficult to maintain good nutritional status (Amarya,*et al.*, 2015). India has nearly 120 million elderly people with multiple physical, social, psychological, and economic problems with unmet needs in all domains of health (Adhikari, 2017).

In India old-aged people generally depend on their children for financial, moral, and physical support (Bhushanam,*et al.*, 2013). Many a time the old-aged people face financial problems. It could be due to lack of income, irregularity in allowances provided by facilities or families (Khole and Soletti, 2018), and lack of preparedness for old age (Roy, 2019). Which further affects their nutrition and life conditions (Mane, 2016).

But there is a paucity of information regarding the nutritional status of older adults in the country (Abraham,*et al.*, 2018). According to Ghosh,*et al.*, (2017), the magnitude of malnutrition among the elderly in India is underreported. They also mentioned that a very large proportion of the older population is underweight, which is very troubling. In the old-aged population, malnutrition is both a health outcome as well as a risk factor for diseases and can increase the risk of morbidity and mortality in them (Joymati,*et al.*, 2018). Prevention and treatment of malnutrition is an important goal in clinical nutrition. The early and precise diagnosis of malnutrition is essential to initiate nutritional therapy as soon as possible (Kharat,*et al.*, 2017). Many other studies have been conducted to understand the condition of the old-aged population and mentioned the importance of this kind of study nationally (Vedantam,*et al.*, 2009; Khole and Soletti, 2018; Krishnamoorthy,*et al.*, 2018; Mamta,*et al.*, 2018; Mohanraj,*et al.*, 2019; Rashid,*et al.*, 2020) and Internationally (Aganiba, 2015; Khalesi and Bokaie, 2015; Elghazally and Saied, 2019; Shahabi,*et al.*, 2019; Cheong,*et al.*, 2020; Roy and Jana, 2020).

Objectives

The old-aged population is one of the most vulnerable sections in our community but not enough attention and focus was given towards their problems. This study tries to focus on the nutritional status of the old-aged population of a district town of West Bengal

(Midnapore). This study tries to examine the nutritional status and different socio-economic factors that influence the nutritional status of the study population. This study also tries to explore the sex differences in the nutritional status of the old-aged population in the study area.

Materials and Methods

The present study was carried out in the Midnapore municipal area, Paschim Medinipur, West Bengal, India. This is a cross-section and ex-post-facto research and the research is conducted among the elderly population (aged 60+ years) of the Midnapore municipal area. Participation in the study was voluntary and verbal consent was taken from each of the participants. A total of 200 elderly individuals were selected in the present study. To select the participants purposive sampling method was used. Among the selected individuals, 90 were males and 110 were females. Both socio-economic and anthropometric measurements were collected for this study. First-hand data were collected from each of the study participants using structured schedule and interview methods. Anthropometric measurements were collected using standard procedures (Weiner and Lourie, 1981). All the anthropometric measurements used in this study were non-invasive and had minimal risk.

Collected data were organized and analyzed using SPSS (Statistical Package for Social Sciences) version 16. Collected data were categorized according to the sex and socio-economic status of the participants. Appropriate descriptive and inferential statistical analyses were used to analyze the data. In the present study, a p-value ≤ 0.05 was considered statistically significant. The nutritional status of the participants was calculated using the BMI category of the participants. The BMI of participants was calculated using standard formula as given below-

$$\text{BMI} = \frac{\text{Weight in kilogram}}{(\text{Height in meter})^2}$$

The nutritional status of male and female participants was compared using the Chi-Square test.

Results

Table 1 represents the socio-economic background of the study participants. This table can help us to understand the participants of the study. The highest number of participants both male and females belong to the 60 to 64 years age group. With the increasing age group, the number of participants decreases, and the lowest number of participants can be found from the 80+ age group. The educational status of study participants is not very good. Male participants have a much better educational status compared to female participants. Preliterate participants are much higher, nearly double in proportion in females compared to male participants. Only 5 participants have graduation or higher educational status, and among those 5 participants, 1 was female. Many participants from both sexes do not work, which is very normal at this age. Surprisingly many more participants have to work at this old age. The retired persons had mainly worked at private companies and businesses, and a very few of them were government employees. Most of the participants don't have any permanent income. Those who work also have very low incomes.

Table 1
Background of the study participants

	<i>Male</i>		<i>Female</i>		<i>Total</i>	
	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>
Age						
60-64	39	43.3	58	52.7	97	48.5
65-69	27	30.0	21	19.1	48	24
70-74	10	11.1	17	15.5	27	13.5
75-79	11	12.2	9	8.2	20	10
80+	3	3.3	5	4.5	8	4
Sex						
Participants	90	45.0	110	55.0	200	100.0
Educational Status						
Preliterate	32	35.6	77	70.0	109	54.5
Primary	13	14.4	15	13.6	28	14.0
Upper-primary	35	38.9	14	12.7	49	24.5
Secondary	6	6.7	3	2.7	9	4.5
Graduate+	4	4.4	1	0.9	5	2.5

Occupational Status

No work	31	34.4	79	71.8	110	55.0
Retired	33	36.7	5	4.5	38	19.0
Business	13	14.4	4	3.6	17	8.5
Day Labour	12	13.3	7	6.4	19	9.5
House Maid			15	13.6	15	7.5

Income

No income	63	70.0	84	76.4	147	73.5
<2500	13	14.4	24	21.8	37	18.5
2501-5000	8	8.9	2	1.8	10	5.0
5001-7500	5	5.6	—	—	5	2.5
7501-10000	—	—	—	—	—	0.0
10001+	1	1.1	—	—	1	0.5

Table 2 represents the overall nutritional status of the study population. Percentage of Chronic Energy Deficiency I (CED I) and Chronic Energy Deficiency II (CED II) is higher among female participants (8.2 percent and 10.9 percent respectively) compared to their male counterparts. The percentage of overweight participants was slightly higher among males (16.7 percent) compared to females (14.5 percent). But obesity was only found among the female participants (4 female participants were obese).

Table 2

Nutritional Status of old-aged Population of Midnapore town

<i>Nutritional Status</i>	<i>Male</i>		<i>Female</i>		<i>Total</i>	
	<i>Number</i>	<i>%</i>	<i>Number</i>	<i>%</i>	<i>Number</i>	<i>%</i>
CED I	1	1.1	9	8.2	10	5.0
CED II	1	1.1	12	10.9	13	6.5
CED III	11	12.2	11	10	22	11.0
Normal	62	68.9	58	52.7	120	60.0
Overweight	15	16.7	16	14.5	31	15.5
Obese	—	—	4	3.6	4	2.0

Table 3 represents the association of socio-economic factors with nutritional status. The sex of the participants has a strong association with the nutritional status of the participants. The difference between

male and female participants in nutritional status is statistically significant ($\chi^2=6.939$; $p\leq0.05$). The occupational status of the study participants also has a statistically significant ($\chi^2=15.553$; $p\leq0.05$) association with nutritional status. The age and income categories of the participants have no significant association with their nutritional status. Whereas the educational status of the participants has a statistically significant association ($\chi^2=15.415$; $p\leq0.05$) with nutritional status.

Table 3
Socio-economic factors and nutritional status of study participants

Socio-economic variable		Nutritional Status								χ^2
Sex	Underweight		Normal		Overweight**		Total			
Male	13	14.4%	62	68.9%	15	16.7%	90	45%	6.939*	
Female	32	29.1%	58	52.7%	20	18.2%	110	55%		
Occupation										
Do not work	30	27.3%	63	57.3%	17	15.5%	110	55%	15.553*	
Retired	3	7.9%	23	60.5%	12	31.6%	38	19%		
Business	5	29.4%	9	52.9%	3	17.6%	17	8.5%		
House Maid	1	6.7%	13	86.7%	1	6.7%	15	7.5%		
Daily Labour	6	31.6%	11	57.9%	2	10.5%	19	9.5%		
Age category										
60-64	23	23.7%	59	60.8%	15	15.5%	97	48.5%	0.986	
65-69	11	22.9%	27	56.3%	10	20.8%	48	24%		
70-74	5	18.5%	17	63.0%	5	18.5%	27	13.5%		
75+	6	21.4%	17	60.7%	5	17.9%	28	14%		
Income Category										
No Income	33	22.4%	86	58.5%	28	19.0%	147	73.5%	8.4	
<2500	6	16.2%	26	70.3%	5	13.5%	37	18.5%		
2500-5000	5	50.0%	3	30.0%	2	20.0%	10	5%		
5000+	1	16.7%	5	83.3%	0	0.0%	6	3%		
Educational Status										
Pre-literate	33	30.3%	65	59.6%	11	10.1%	109	54.5%	15.415*	
Primary	4	14.3%	18	64.3%	6	21.4%	28	14%		
Upper Primary	6	12.2%	30	61.2%	13	26.5%	49	24.5%		
Secondary and above	2	14.3%	7	50.0%	5	35.7%	14	7%		

*= $p\leq0.05$; overweight**= overweight and obesity

Table 4 represents the binary regression analysis to predict the influence of different socio-economic factors on the nutritional status of

the study participants. Here, socioeconomic variables like- sex, income, Working status, age category, and educational status were used as independent variables, and the nutritional status of the participants was used as the dependent variable. The dependent variable was coded in binary (0=malnourished and 1= normal). Here we can observe that only the sex of the participants is a statistically significant predictor of nutritional status. The female elderly participants have a higher chance (2.229 times higher) of being malnourished compared to their male counterparts.

Table 4

Binary regression analysis to predict the influence of different socio-economic variables on nutritional status of the old-aged population of Midnapore Town.

<i>Independent Variable</i>			<i>95% C.I. for EXP (B)</i>	
	<i>Exp (B)</i>	<i>Significance</i>	<i>Lower</i>	<i>Upper</i>
Sex				
Sex (M) [®]				
Sex (F)	2.229	0.019	1.140	4.361
Income				
Income (No) [®]				
Income (Yes)	0.712	0.507	0.262	1.938
Working status				
Working (No) [®]				
Working (Yes)	1.186	0.726	0.456	3.090
Age category				
Age (60-69) [®]				
Age (70+)	0.821	0.562	0.422	1.598
Literacy				
Literacy (No) [®]				
Literacy (Yes)	1.206	0.589	0.611	2.383
Constant	1.292	0.601		

Discussion

“One trend is certain: the aging of populations is rapidly accelerating worldwide. For the first time in history, most people can expect to live into their 60s and beyond” (Dr. Margaret Chan, Director-General, WHO). Since the beginning of history, the old-aged population was always outnumbered by the children under age 5 years. However, for the first time, this is going to change and the elderly population will outnumber the children under 5 years (WHO, 2011). Traditionally, old-aged people were taken care of by the family

(mainly by sons) but with changes in lifestyle and social values traditional joint families are breaking down and nuclear families are forming. As a result of which, the elderly population in India is facing difficulties from many fronts (Masillamani, 2015).

Proper nutrition is very important for good health (Shalini, *et al.*, 2020). One of the major challenges regarding health care conditions in India in the present scenario is the healthcare and nutritional need of the old-aged population (Zareen and Vasundhara, 2016). Many of the old-aged men and almost all of the old-aged women have unmet financial needs and about 80 percent (men 72.8 percent and women 86.7 percent) have unmet food and nutritional needs (India Ageing Report, 2017).

The present study consists of 200 elderly individuals. Most of the participants currently don't have any permanent occupation and not working (71 percent of males and 76 percent of females), which is very normal considering the age of the participants. Rest of the participants are currently working mostly in laborious jobs. Most of the participants don't have any constant source of Income (73.5 percent) and had to depend on family members. This shows a severe lack of preparedness for old age on the part of the participants. Those who work have a very minimal income that can barely meet their day-to-day necessities. The male-female disparity in educational status is very high among the old-aged participants. The proportion of preliterate individuals is nearly double in female participants (70 percent) compared to male participants (35.6 percent).

In the study population, 68.9 percent of the males and 52.7 percent of the females have normal nutritional status and others were malnourished. CED I and CED II were higher among female participants (8.2 percent and 10.9 percent respectively) and CED III was higher among male participants (12.2 percent). Overall underweight was higher among female participants (29.09 percent) compared to male participants (14.4 percent). Overweight was slightly higher among male participants (16.7 percent) but obesity was only found among female participants (3.6 percent). Underweight (BMI < 18.5) was higher among females (29.09 percent) compared to males (14.4 percent). Overall malnourishment was also higher among

females (47.27 percent) than males (31.1 percent) in the study population. A few studies reported higher malnourishment in males compared to females (Singh, *et al.*, 2014; Renjini, *et al.*, 2019), others found a higher percentage of malnourishment (Reddy, *et al.*, 2014; Shivraj, *et al.*, 2014; Mathew, *et al.*, 2016; Santosh, *et al.*, 2017; Zareen and Vasundhara, 2018; Tamang, *et al.*, 2019), and some others reported lesser percentage of malnourishment (Shreyashkumar, *et al.*, 2018; Nguyen, *et al.*, 2020) compared to the present study population. Sex ($\chi^2=6.939$; $p\leq 0.05$), Occupation ($\chi^2=15.553$; $p\leq 0.05$), and educational status ($\chi^2=15.415$; $p\leq 0.05$) of the participants were found to have a statistically significant association with nutritional status. Whereas sex is a statistically significant ($\text{Exp(B)} = 2.229$; $p\leq 0.05$) predictor of nutritional status of the old-aged participants.

Conclusion

The present study population has a very high rate of malnutrition. Which indirectly indicates improper health and well-being of the study participants. Financial dependency is very high and is a very big social problem in Indian society as well as in the present study population. Financial support for the old-aged population is very important to improve the overall situation of the old-aged people. Health and nutritional awareness program are also very important to improve the situation. Regular monitoring of the health and nutritional condition of the old-aged population is a must and this study recommends further in-depth studies in the present and other areas.

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Eating Behaviour and Lifestyle Changes Among Elderly During COVID-19 Pandemic

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ABSTRACT

This web-based cross-sectional survey aimed to explore the changes in eating behaviour and lifestyle pattern among elderly residing in Delhi during the Covid-19 pandemic. 113 elderly persons (46 males and 67 females), age varying from 61yrs. to 75yrs., were purposely selected in this study. The data was collected using Google Form and the participants were asked to fill in the online Google Form whose link was shared via email and WhatsApp. Telephonic interviews were conducted for those who did not have android mobile phones. The findings of the study revealed that 44.44 per cent elderly were consuming healthier meals in joint families. 23.01 percent of participants were often skipping meals. 66.37 percent of participants reported neutral mood, 61.06 per cent of participants reported that emotions influence their eating pattern. Participants' meals were based on their health status (66.37%), likes and dislikes (56.64%), hunger (53.1%), and family (44.25%). A significant relationship was observed between gender and skipping meals ($p < 0.05$) in which the frequency of skipping meals was higher in males (61.53%). Only 35.4 per cent of the participants was physically active in which most of them were going for a walk (69.91%) while 37.17 per cent of participants were engaged in extracurricular activities. Thus, this study shows an impact of the Covid-19 pandemic on the psychological and emotional responses in the

elderly thereby affecting their eating behaviour including changes in meal patterns and physical activity level that directly or indirectly pose a risk to public health.

Keywords: Coronavirus, Covid-19, Eating behaviour, Elderly, Older adults, Physical activity

There is a massive impact of the Covid-19 pandemic on human health due to social distancing, isolation at home, and sudden lifestyle changes (Azzolino, *et al.*, 2020). Self/social isolation and physical distancing increase the risk of developing depression, suicide attempts, inflammatory disease, and anorexia among the elderly.

Studies have shown that the Covid-19 virus causes a higher mortality rate in the elderly population and worsens the outcomes for those with comorbidities such as hypertension, diabetes, cardiovascular disease, chronic kidney disease (CKD), and chronic respiratory disease. Infection due to virus is fatal, it also affects the nutritional status of the elderly and the its common symptoms include dyspnea, cough, fatigue, and fever (Shahid, *et al.*, 2020).

It is commonly seen that abnormal eating behaviours, eating habits and dietary changes in elderly people are prevalent that impact their health status (Cipriani,*et al.*, 2016).

Improving public health during this pandemic requires not only changes in lifestyle related to all human sciences but also requires social and behavioural studies, biological sciences, knowledge from the medical, including dietary habits and lifestyle patterns. There are very few studies reported earlier in India that show the challenges related to eating behaviour and changes in lifestyle pattern among the elderly in the Covid-19 pandemic.

The present study aimed to analyze and explore the various changes and challenges related to eating behaviour and physical activity among the elderly residing in Delhi in the Covid-19 pandemic.

Method

Study design

A web-based cross-sectional survey was conducted among elderly aged 60 years or above residing in Delhi, India to assess their eating behaviour and lifestyle challenges.

Sample

113 elderly persons ((46 males and 67 females), age varying from 61years to 75years,citizens of Delhi,were purposely selected in this study. Only the participants who agreed for the participants were included in the study.

Tools and techniques for data collection

The data was collected using a Google Form web survey. The participants were asked to fill in the online survey whose link was shared via email and WhatsApp. Telephonic interviews were taken for those who did not have android mobile phones.

A brief description of the study, its objectives, and the declaration of anonymity and confidentiality were also given to the participants before the starting of the questionnaire. Informed consent was taken from all the participants at the time of enrolment by putting a tick on 'Agree' before filling the form.Responses were only saved by clicking on the '**Submit**' button provided at the end of the questionnaire.

Survey Questionnaire

It consists of 3 sections:

1) Section I

This section comprised questions for assessing information regarding participant's name, age, gender, contact number, sources of income, family background such as a total number of family, family type, their socio-economic status, and where they reside in Delhi.

2) Section II

This section included questions to assess the participant's attitude towards eating behaviour like their meal pattern and timings, skipping meals, reasons for skipping meals, food preference, hunger status, water consumption in a day. The mood affects elderly eating behaviour and to find out this, questions on how their mood affects their eating pattern were also added.

3) Section III

This section comprised of questions related to lifestyle activities to assess the lifestyle changes and challenges of the elderly.

Pretesting

Pretesting was done on 15 elderly other than the study sample. This helped to remove the errors and mistakes from the questionnaire and some changes were made in the questionnaire as per the responses of the pretesting.

Statistical analysis

All data were entered and coded into Ms-Excel sheets. It was then statistically analyzed using SPSS and Ms-Excel wherein descriptive statistics of the participant's baseline characteristics and responses will be provided as frequencies and percentages. Association between the variables was analyzed using Pearson's Chi-square test using SPSS version 23.0.0.0.

Ethical Clearance

Participants were informed about the purpose of the study through WhatsApp, Email, and phone calls, and consent was also obtained. The study was approved by the Institutional Ethics Committee, Lady Irwin College, University of Delhi.

Results and Discussion

Socio-demographic profile

In the present study (table 1), 59.29 per cent were female participants and 40.71 per cent were male participants. It has been observed that among the total participants, most of the participants i.e., 53.1 per cent were from the age group of 61-75 years. Income is an important indicator of the social and economic status of an individual. Low income affects the purchasing power and this, in turn, affects their food security by limiting their food choices, thereby leading to malnutrition (Khole, 2019). The present study showed that about 49.6 per cent, i.e., half of the participants' source of income was a pension. On the other hand, 38.9 per cent of participants' income was supported by their children. Results showed that almost half of the participants lived in a nuclear family (43.4%) followed by a joint family which is 38.9% and the rest lived in the extended family (17.7%) where most of the participants (77.88%) belong to the middle-income group whereas the rest from the low-income group i.e., 2.66 per cent. The key determinants of the health status of an individual affect educational

background, food consumption pattern, and other lifestyle behavioural factors such as food, obesity, physical activity, alcohol consumption, and smoking, which in turn are affected by socioeconomic status.

Table 1
Socio-demographic profile of the participants (n=113)

<i>Variables</i>	<i>Number of participants (%)</i>
Gender	
Male	46 (41%)
Female	67 (59%)
Age	
60 years	27 (23.89%)
61 - 75 years	60 (53.1%)
76 - 90 years	24 (21.24%)
Above 90 years	2 (1.77%)
Sources of income	
Pension	56 (49.6%)
Supported by their children	44 (38.9%)
Part-time job	11 (9.7%)
Rent	1 (0.9%)
Dairy farm	1 (0.9%)
Socioeconomic status	
Low-income group	3 (2.66%)
Middle-income group	88 (77.88%)
Upper middle-income group	19 (16.81%)
High-income group	3 (2.66%)
Type of family	
Nuclear	49 (43.4%)
Joint	44 (38.94%)
Extended	20 (17.7%)

Number of meals consumed in a day

In the present study (table 2), it was found that the majority of the participants 54.87per cent were consuming meals 3 times a day. However, 22.12per cent reported having meals only 2 times a day. A few participants (5.31%) have also reported that they were consuming meals only when they were hungry. Studies found that reduced pleasure from eating is mostly seen in later life (Whitelock & Ensaff, 2018). It was also found that social isolation and loneliness are the major causes of depression that lead to a lack of

interest in eating among the elderly (Liu,*et al.*, 2016). One of the recent studies showed that more than half of the participants had not changed the number of their daily meals (57.8%) in the Covid-19 pandemic, while 17.5per cent reported skip or introduced a break and 23.5per cent reported skipping the main meal in Covid-19 pandemic (Di Renzo, *et al.*, 2020).

Table 2

Eating behaviour of the participants (n=113)

<i>Variables</i>	<i>Number of participants (%)</i>
Food habit	
Vegetarian	66 (58.41%)
Non-vegetarian	37 (32.74%)
Ovo-vegetarian	10 (8.85%)
No. of meals consumed in a day	
2 times	25 (22.12%)
3 times	62 (54.87%)
More than 3 times	20 (17.7%)
When feels hungry	6 (5.31%)
Frequency of skipping meals	
Often	26 (23.01%)
Sometimes	21 (18.58%)
Rarely	36 (31.86%)
Never	30 (26.55%)
Types of food mostly prefer to eat	
Homemade food	113 (100%)
Outside food	0
Packaged food	0
Amount of water consumption in a day	
Less than 6 glass	41 (36.28%)
6-7 glasses	41 (36.28%)
7-8 glasses	11 (9.74%)
More than 8 glasses	20 (17.7%)
Frequency of feeling hungry	
Never	27 (23.89%)
Occasionally	66 (58.41%)
Most of the time	17 (15.04%)
All of the time	3 (2.65%)

Effect of taste on food consumption

Always	23 (20.35%)
Occasionally	46 (40.71%)
Rarely	23 (20.35%)
Never	21 (18.58%)

Mood fluctuation

Very sad	2 (1.77%)
Sad	0
Neither sad nor happy	75 (66.37%)
Happy	34 (30.09%)
Very happy	2 (1.77%)

Factors like emotions influencing the eating pattern

Yes	69 (61.06%)
No	44 (38.94%)

Participant eating pattern when with family

Often increases	27 (23.89%)
Sometimes increases	37 (32.73%)
No effect	49 (43.36%)

Frequency of skipping meals

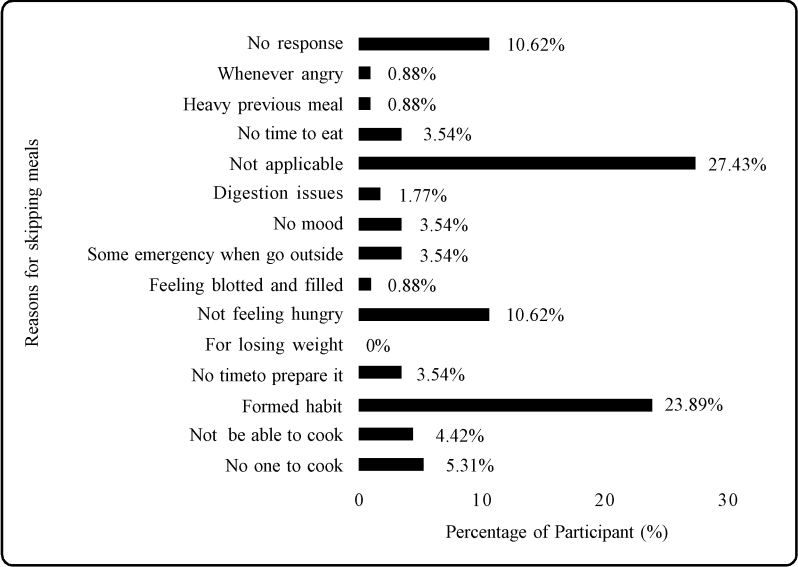
Eating behaviours consist of both physical and social activities that refer to the consumption of food, either dependent or independent of each other that encompasses a variety of behaviours related to nutritional intake (Watson & Green 2006). Since, skipping meals greatly influences health, it is always advised to consume meals on time. In the present study (table 2), 31.86 per cent were rarely skipping meals while 26.55 per cent never skipped meals. Research study suggests that breakfast as the first meal of the day is most important from a dietary perspective. Energy from the food is vital for intellectual performance and optimal cognitive functions (Diekmann, *et al.*, 2019). From the above study, it can be concluded that taking meals on time is necessary to prevent malnutrition and protect cognitive function among the elderly. One of the recently conducted studies reported that about 10–15 per cent of participants found difficulty in obtaining groceries, skipping warm meals, eating less than normal, and eating too little in the Covid-19 pandemic which could lead to undernutrition among them (Visser, *et al.*, 2020).

Reasons for skipping meals

From the conducted study, it was observed that most of the participants i.e., 23.89per cent skipped meals because of formed habits. Other reasons include not feeling hungry, lack of time to cook, lack of mood, no time to eat, and also because of going outside due to some emergency, no one to cook, and not being able to cook (figure 1). According to one of the studies, most of the elderly cook food but do not want to eat and this can lead to depression, poor appetite, anxiety, loneliness, and ultimately lead to malnutrition among them (Whitelock&Ensaff, 2018).

Another study discussed that reduced physical function and manual dexterity were linked to participants choosing simple meals that were easy to prepare. It also affects their dietary intake and nutritional status (Lane,*et al.*, 2014). However, it was reported in the current studies that in Covid-19 pandemic situation elderly skipping their meals could be on account of living alone, fever, the coronavirus-2 infection, not being able to cook due to weakness, and reduced food availability in lockdown (Di Renzo,*et al.*, 2020; Ceolin,*et al.*, 2020).

Figure 1
Reasons for skipping meals (%)



*Multiple responses

Type of food mostly preferred to eat

As shown in table 2, all the participants preferred homemade food only. Eating home-cooked meals more frequently is significantly associated with lower BMI and prevents lifestyle disorders such as diabetes, obesity, and cardiovascular disease among the elderly which could further reduce the consequences of coronavirus-2 infection (Mills,*et al.*, 2017; Ceolin,*et al.*, 2020). However, a recent Italian study reported that the Covid-19 pandemic situation has limited access to daily grocery shopping due to lockdown which may lead to reduced consumption of fresh foods, especially fruit, vegetables, and meats. Emotional and psychological responses to the current pandemic also impact their eating behaviours. The quoted study also found that consumption of homemade desserts, bread, and pizza has increased in the Italian elderly. On the other hand, the consumption of savoury snacks, snacks, processed meat, carbonated and sugary drinks has decreased in the Covid-19 pandemic because of the reduction in grocery shopping (Di Renzo,*et al.*, 2020).

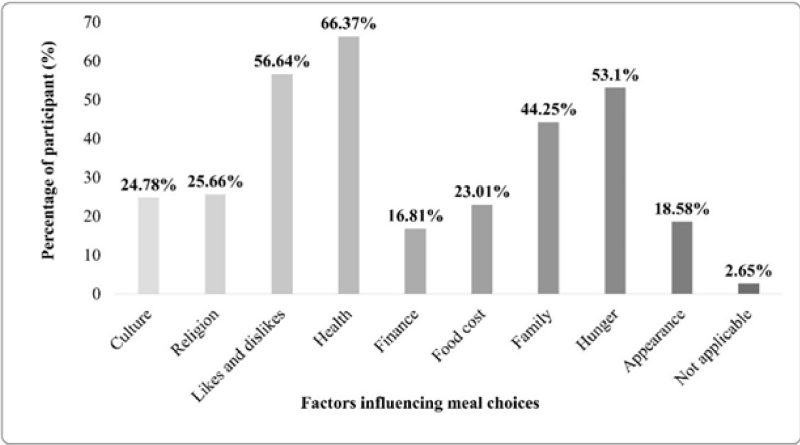
Factors influencing meal choices

People choose their food based on their culture, income or finance, health, likes and dislikes, appearance, religion, family (Kim, 2016). According to figure 2, most of the participants choose meals based on their health status (66.37%), likes and dislikes (56.64%) followed by hunger, family, religion, and culture. Food cost, finance or family income, and appearance were least considered by the participants while selecting foods.

Sensory perceptions, health and nutrition beliefs, financial considerations, convenience and concerns, and quality of food choice decisions help in the relationship management with others. The Elderly's food choices are mostly influenced by culture, religion, environmental factors, finance, or family income rather than the nutrient contents of the food (Kim, 2016). The previous study has also found the cost of food is also considered to be the factor affecting food decisions made by the elderly (Whitelock & Ensaf, 2018).

Figure 2

Factors influencing meal choices of the participants (n=113)



*Multiple responses

Amount of water consumption

The study conducted by Hooper, *et al.*, (2014), reported that 50per cent of body weight accounts for water in the elderly. As it is considered to be crucial for various metabolic activities in the body, it also plays an important role in temperature regulation, medium of biochemical reactions, fluid-electrolyte turnover, substrate transport across membranes, in circulation (blood, lymph), and maintaining homeostasis in the body. From the present study (table 2), it was observed that participants who were drinking more than 8 glasses of water constituted 17.7 per cent, who were drinking 7-8 glasses constituted 9.74 per cent while 36.28 per cent were drinking 6-7 glasses of water and the same percentage i.e., 36.28 per cent of participants were drinking less than 6 glasses of water in a day. From the quoted studies, we can conclude that there is a need for education to create awareness among them regarding the benefits of drinking water and include other sources of food in their diet to keep them hydrated and healthy. According to the study conducted by Pross (2017), cognition is negatively influenced by the dehydration in elderly and according to the WHO

(2020) guidelines in the Covid-19 pandemic, the elderly should drink a sufficient amount of water approximately 8–10 cups of water per day.

Frequency of feeling hungry

With the increase in age, the desire to eat meals decreases, and the condition called dysphagia is mostly prevalent among them (Aselage, 2010). In the present study (table 2), participants who were feeling hungry occasionally constituted 58.41 per cent, while 23.89per cent never felt hungry. Anorexia of aging, defined as the loss of appetite or decrease in food intake in later years of life, is considered to be one serious problem in the geriatric population. One of the reasons might be lower gastric emptying in older persons that may further result in the decrease of food intake and appetite. (Di Francesco,*et al.*, 2007).

Smoking, diseases, and medications worsen the taste bud's functionality. The decline in saliva secretion may also reduce the ability to dissolve foods and limits their interaction with taste receptor cells present on the tongue (Landi,*et al.*, 2016). These factors also lead to a decrease in the frequency of eating meals among them. In one of the recently conducted studies, it was found that age is associated with appetite and it was also seen that appetite might be reduced due to eating alone and due to anxiety and stress from being at high risk for Covid-19 infection. (Visser,*et al.*, 2020).

Mood Fluctuations and factors like emotions influencing eating patterns in elderly

It can be observed that 66.37per cent participants had a neutral mood and 30.09per cent participants were happy at the time of the study. It was also observed that when the food tastes good, only 20.35per cent of participants always eat more while 18.58per cent never eat more no matter how the food tastes (table 2). At the later stages of life, the natural losses of taste and smell occur that may lead to a decrease in appetite and poor dietary habits (Yannakoulia,*et al.*, 2018). It was found that 61.06per cent of participants reported that emotions influence their eating pattern while 38.94per cent of

participants said that emotions did not affect their eating pattern (table 2). The results revealed that there was no influence of emotions like happiness and sadness on the eating pattern of the participants. However, it was reported that stress can push the elderly toward overeating, mostly looking for more palatable foods rich in fat and sugar in the quarantine period during the Covid-19 pandemic situation (Ceolin, *et al.*, 2020).

Participants eating patterns when with family

Reported data in table 2 revealed that 23.89per cent of participants were eating more when they were with their family and 43.36per cent of participants had no effect on eating patterns even while consuming meals with the family. One of the previously conducted studies has found that the elderly eat more in the presence of others. Another reason found is that the elderly get social support, encouragement and do not feel alone while eating with the family or other people and the importance of all these increases in Covid-19 pandemic as loneliness and depression is highly prevalent among elderly in the present lockdown and self-isolation condition (Millen,*et al.*, 2001; Ceolin,*et al.*, 2020).

Association between frequency of skipping meals and gender of the participant

From the obtained results (Table 3), it has been observed that the frequency of skipping meals and gender of the participants were significantly related to each other ($p<0.05$). It was observed also that 61.53per cent of males were often skipping meals. On the other hand, 38.46per cent of females often skip meals while 90.48per cent sometimes skip meals. It was also found that the majority of the elderly females rarely skipped meals and the frequency of skipping meals was higher in male participants than the female participants and the reasons could be less or no cooking time, no time to eat, lack of desire, and feeling bloated (figure 1). In one of the previous studies, it was found that females enjoy cooking and preparation of food for themselves and other family members whereas males were not interested in cooking especially when they have to cook for themselves only (Edfors & Westergren, 2012).

Table 3

Distribution of the participants based on the frequency of skipping meals and gender of the participant (n=113)

Frequency of skipping meals	Gender		χ^2 p-value
	Male	Female	
Often	16 (61.53%)	10 (38.46%)	p value = 0.03 Chi square value = 13.626 Significance level = 5%
Sometimes	2 (9.52%)	19 (90.48%)	
Rarely	14 (38.89%)	22 (61.11%)	
Never	14 (46.67%)	16 (53.33%)	

Association between eating pattern when with family and type of the family

From table 4, it can be seen that both the variables i.e., eating pattern when with family and type of the family showed no association ($p>0.05$), this implied that they did not show any effect on each other. However, 40.74per centof participants belonged to the nuclear family, 44.44per cent belonged to the joint family consume more food when with the family. From the reported result, it was observed that consumption of food was more in the joint family. The present study collaborates the previous study wherein older adults who eat meals in the company of others have better dietary quality. Contact with family and trusted people through telephone and messages is also important in the case of living alone, and it could help to reduce loneliness in the Covid-19 pandemic situation (Ceolin,*et al.*, 2020).

Table 4

Distribution of the participants based on eating pattern when with family and type of the family (n=113)

The eating pattern when with family	Family type			χ^2 p-value
	Nuclear	Joint	Extended	
Yes	11 (40.74%)	12 (44.44%)	4 (14.81%)	p value = 0.08 Chi square value = 8.291 Significance value = 5%
Sometimes	10 (27.03%)	18 (48.65%)	9 (24.32%)	
No	28 (57.14%)	14 (28.57%)	7 (14.29%)	

Frequency of physical activity

Improvements in mental health, emotional, psychological, and social well-being, and cognitive function all are associated with regular physical activity (WHO, 2020). Physical activity prevents cardiorespiratory, endocrine, neuromuscular impairment, mobility loss, metabolic chronic conditions, or maintaining community independence which is common in the elderly (Rantakokko, *et al.*, 2010; Valenzuela,*et al.*, 2019). In the present study (table 5), 35.4 per cent of participants among total were physically active and 37.17 per cent were inactive. It was found in one of the studies that pre-covid physical activity level was not associated with the current Covid-19 pandemic (Visser,*et al.*, 2020). One of the studies talked about the effectiveness of individualized home-based exercise programs that helps in reducing unnecessary falls and improving physical performance among the elderly. These kinds of intervention programs can also be helpful in current scenarios of lockdown (Hill,*et al.*, 2015).

Table 5*Lifestyle activities of the participants (n=113)*

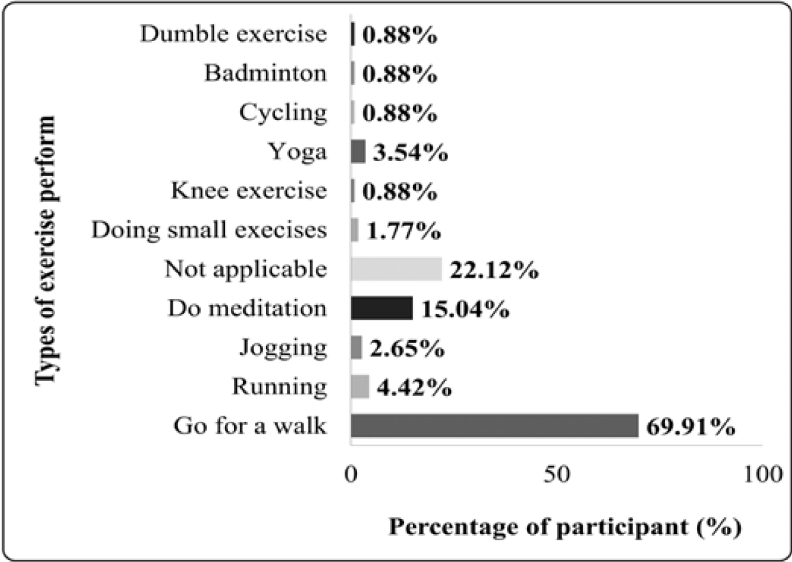
Variables	Number of the participants (%)
Frequency of physical activity	
Yes	40 (35.4%)
No	42 (37.17%)
Sometimes	31 (27.43%)
Time engaged in exercise per day	
15 minutes to 1/2 an hour	45 (39.82%)
1/2 an hour to 1 hour	22 (19.47%)
1-2 hours	3 (2.65%)
More than 2 hours	2 (1.77%)
Not applicable	41 (36.28%)
Participant engaged in extracurricular activities	
Yes	42 (37.17%)
No	71 (62.83%)

Time engaged in exercise per day

WHO(2020) guidelines for elderly aged 65 years or above are similar to adults. The elderly should engage in moderate-intensity of at least 150-300 minutes of aerobic physical activity or 75-150 minutes of vigorous-intensity training in a week. It improves the cause of mortality with lifestyle disorders. Along with that, an increase in physical activity can also help in preventing injuries by a fall.

In the present study (table 5) it was observed that the majority of participants were doing exercise half an hour (39.82%) followed by half an hour to 1 hour (19.47%). From the obtained responses, it can be concluded that most of the participants were not engaged in physical activity. One of the reasons could be the lockdown situation in the city as the study was conducted during the Covid-19 pandemic (Visser,*et al.*, 2020). In the present study (figure 3), it was found that more than half of the participants went for a walk (69.91%), followed by meditation (15.04%). Other activities include running, jogging and very few were also doing small exercises, dumble exercise, badminton, cycling, and knee exercise.

Figure 3
Type of exercises perform

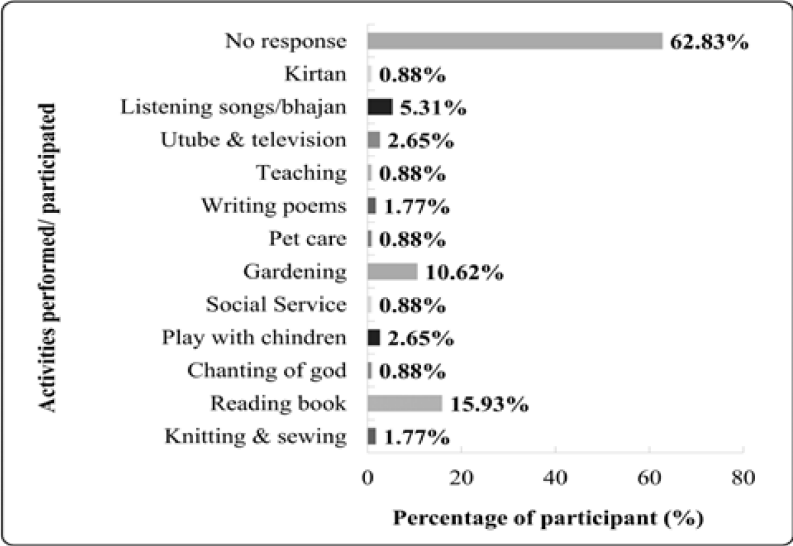


*Multiple responses

Participant engaged in extracurricular activities

The practice of physical activity as well as recreational activity promotes psychosocial development, boosts self-esteem among the elderly, and emotional re-balancing (de Oliveira,*et al.*, 2019). As shown in table 5, only 37.17per centof participants were engaged in extracurricular activities while more than half (62.83%) were not engaged in any extracurricular activities. This shows that there is a need to motivate the elderly for engaging in extracurricular activities as the studies have shown that performing extracurricular activities reduces psychological stress and increases self-esteem (de Oliveira,*et al.*, 2019).

Figure 4
Extracurricular activities performed/ participated by the participant



*Multiple responses

In the present study (figure 4), participants engaged in various extracurricular activities in which reading newspapers and books (15.93%) and gardening (10.62%) were performed by most of them while listening to songs and bhajans, youtube, and television, playing with grandchildren, knitting and sewing, writing poems, chanting of God, teaching, social service, kirtan, and pet care were also reported in their daily extracurricular activities. One of the studies reported

one-third of participants reported a daily screen time of 4–5 hours during the Covid-19 pandemic and who were routinely involved in leisure-related activity also increased by more than double (Chopra,*et al.*,2020).

Conclusion

It can be concluded from the present study that the covid-19 pandemic has greatly affected the eating behaviour and lifestyle pattern among the elderly. Skipping meals, mood fluctuation, and decline in hunger were reported. The decline in sensory functions, the taste of food, emotions, and family type also affected their eating behaviour. Physical activity level and extra-curricular activities were also limited due to self-isolation, lockdown situation, and emotional stress during a pandemic. All these can cause poor health and nutritional status among them that can further increase the chances of progression and development of lifestyle-related diseases and other chronic diseases. Therefore, it is important to understand the prevalence and cause of poor health and nutrition among the elderly to develop appropriate treatment and preventive strategies to improve their health in this pandemic. However, further research is needed on the more extensive population to understand the various challenges in terms of eating behaviour, psycho-social health, and other lifestyle factors concerning aging among the elderly in the Covid-19 pandemic.

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Elderly Care in Rural Assam-Emerging Issues and Challenges

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ABSTRACT

The objective of this study was to explore the challenges experienced by the caregivers(N=91) in rural Assam. female and male caregivers. The respondents were interviewed with the help of a semi-structured interview schedule. The caregivers' responses were classified into two categories, that is, males and females. Under the male category, married and unmarried sons, elderly male spouses were the caregivers. The female category constitutes the daughter-in-law, elderly women, married and unmarried daughters. Thematic interpretation of the narratives of the respondents showed a significant difference in the experiences and challenges faced by male and female care providers to their elderly relatives.

Keywords: Caregivers, Challenges experienced in caregiving, ADL (activities of daily living), Male caregivers, Female Caregivers, Spouse as a caregiver, Duration of care giving, Self-care

The demographic transition and changing social values, lately in the Indian society, led to various challenges to the elderly in terms of decline in status, abuses, and negligence due to limited income of the children, disagreement among the family members regarding taking responsibility for filial care, have affected the elderly most. The regard and respect towards the elderly and taking care of them

in their old age which once subsisted in the Indian society also becoming weaker gradually (Datta, 2017). Traditional Indian socio-cultural life manifested the highest value and regards towards the elderly. A large number of Asian-Indian caregivers adhered to the cultural norm of *dharma* to provide care to the elderly considering it their duty and not a burden (Chan, 2005; Milne & Chryssanthopoulou, 2005). During that time, elderly care implied only familial care, while taking extra-familial forms of care was generally stigmatized as a 'Bad Family', the daughter-in-law was supposed as 'modern' and evil if she ignored or avoided the commitment of taking care of her elderly in-laws (Cohen, 1998). Nevertheless, in the Indian context, the family is still the primary caregiving agency to the elderly and the institutionalization of elderly care is not getting momentum unlike that in western society (Dunlop, 1980). Cohen (1998) stated that there was no concept of 'senior citizen' in India until the World Assembly on Ageing in 1982 in Vienna and the discourse on elderly care was absent in the public sphere in India before the 1999 Policy. Only after this Assembly in 1982, 'old age' was adopted as a governmental category. The care provided by family members was conceptualized by Law as the ideal form of *Seva* and care. In the 'welfare' section of the National Policy of Older Persons (1999), it is specified that institutional care would be the 'last resort when personal circumstances are such that staying in old age homes becomes necessary'. In Indian society, the concept of elderly care did not arise until a few decades ago because of its age-old joint family structure and bonding in the society. However, transition to nuclear family set-up, lack of community bonding, migration to earn the livelihoods turned into obstacles and created role conflict among the caregivers, as they are becoming unable to take care of the elders even if they wish. Hence, taking care of the elderly now becomes a primary concern and it is being transferred to the state, although, the state is not in a position to take up the initiatives. As a result, elders are getting abandoned in society, and inevitably, it arises who will take the responsibility of the elderly in the days to come.

The objective of this paper was to explore the challenges experienced by the caregivers in rural Assam.

Methodology

Sample

Total 91 respondents, representing 129 households, from the four villages were selected by purposive sampling technique. These primary caregivers were identified with the help of care receivers (elderly under bed-ridden conditions) themselves. At the initial stage of the field study, it was quite difficult to recognize the primary caregivers from the households, therefore, in the first stage, a list of the households was prepared where at least one elderly person resides as per the information available in the voter-list and also in the hands of the respective village headmen. The list contained the house number, age, and gender of the members of the household and excluded the expired elder members. In the second stage, all those selected households were visited and elderly people were interviewed concerning the problems they have faced in their old age. In the next stage, they were asked to identify their primary caregivers, and accordingly, the researchers identified 91 primary caregivers for an in-depth interview. The elderly care-receivers who were under bedridden conditions and unable to interact, in such cases, the researcher interacted with the other family members about the care providers and identified the primary caregiver based on their statements.

All the respondents were interviewed with the help of a semi-structured interview schedule which was prepared following some important aspects covering socio-demographic variables such as age, sex, caste, community, patterns of family, types of household, marital status, education, occupation, and other issues. Thematic interpretation of the narratives was done to find out a variance in the experiences of caregivers.

Result and discussion

Socio-Economic Profile of the Caregivers:

It was found that the age of the caregivers ranges between 20 and 80+ years of age. The Majority i.e. 83.52 percent of the caregivers were female. Among them, 24.18 percent and 23.08 percent caregivers belong to the age group of 40-49 and 50-59 respectively. Out of the

total, 10.99 percent of female and 3.29 per cent of male caregivers belong to the age group of 30-39 and only 1.09 percent of female caregivers fall in the age group of 20-29. Out of the total, 18.68 percent of the caregivers belonged to the age group of 70-79 which constitutes 10.99 percent of female and 7.69 percent of male caregivers, 12.09 percent elderly female and 4.39% male caregivers fall in the age group of 60-69 and remaining 1.09 per cent male elderly and equal percentage of female elderly caregivers belong to '80 and above' age group.

Good numbers of caregivers (76.93%) belonged to the nuclear families while the rest 23.07 percent were from joint families. Regarding the size of the caregivers' family, 59.35 percent have 4-7 members, 30.77 percent have 1-3 members, 7.69 percent have 8-11 members and 2.19 percent have 'more than 11' numbers of members. Significantly, the caregivers belonging to families of 4-7 numbers of members are mostly noticed in the studied areas and most of them belonged to nuclear families. Again, 64.84 percent of caregivers reside in the pucca houses, 20.88 percent and 14.29 percent in semi-pucca and kutchha houses respectively. However, not all pucca houses are well-maintained and well-equipped with basic amenities. In addition, 50.56 percent of caregivers had attained secondary level education, while the rest had attained primary level (31.87%), higher secondary level (9.89%), and illiterate (4.39%) and 'graduate and above' (3.29%). About the marital status of the caregivers, 89.01 percent were married, 8.79 percent were unmarried and 2.20 were a widow. A substantial number of the caregivers (90.10%) had no specific occupation, 5.50 percent caregivers had pensions (be it their own or others), and the rest few are either self-employed, farmers, or daily wage earners. Husbands (60.44%) are the primary earner of the caregivers' family irrespective of their age. Rest primary earners are the mother-in-law, the caregivers themselves, mother, father-in-law, and brother. Table 1 depicts the relation of the caregivers to the elderly whom they had rendered their services as caregivers. Concerning the care receivers, 36.26 percent of the caregivers were wives, 1.10 percent were husband, 24.18 percent were each other, 3.30 percent were unmarried son, 8.79 percent were daughter, 25.27 percent were daughters-in-law and 1.10 percent was sister-in-law.

Table No: 1
Relation of the Primary Caregivers to the Elderly

S. N.	Relationship	Nos. Of Respondents	%
1	Wife	33	36.26
2	Husband	01	1.10
3	Each-other	22	24.18
4	Unmarried son	03	3.30
5	Daughter	08	8.79
6	Daughters- in-law	23	25.27
7	Sister- in-law	01	1.10
	Total	91	100

Types of Care provided and the role played by the Caregivers:

In earlier studies (Jayashree, 2013; Feng, *et al.*, 2013), the care provided to the elderly by the caregivers has been divided into two types viz. the assistance with the activities of daily living (ADL) and the instrumental activities of daily living (IADL). The former includes the activities like toileting, feeding, bathing, walking, or clothing and the latter includes shopping, meal preparation, house cleaning, and managing finance for an individual with chronic illness or disability.

Table No: 1.2
Cares Provided To the Elders

S. N.	Types of care	Male	Female	Total
1	ADL	04	11	15
2	IADL	11	65	76

The study reveals that the numbers of female caregivers are higher in comparison to their male counterparts in both ADL and IADL types of care which were 11 and 65 respectively. In contrast, the number of male caregivers was 4 in ADL and 11 in IADL. The male caregivers represent three unmarried sons and one elderly spouse aged '80 and above'. Besides, in the case of male caregivers, the elderly couples belonging to different age strata are the IADL care providers towards their respective spouses. In both ADL and IADL cares, the female spouses were the primary caregivers, while the male spouses support

and manage the financial matters, especially those elderly who have no pension. It is worth mentioning that ADL caregivers also are the IADL caregivers in some cases but not necessarily vice versa. It is a challenging task for the caregivers who are providing both types of care. The experiences and the challenges the caregivers are confronting in their caregiving journey came out during the interview. The experiences of the caregivers revealed that both types of caregiving are exhausting, however, the experiences of the ADL caregivers are more challenging than that of the IADL caregivers. The age and the economic status of the caregivers are two significant factors in this caregiving process. Moreover, the experiences of the elderly caregivers are more severe than that of their younger counterparts.

Duration of Care-giving

It was revealed that 56.04 percent of the caregivers have been providing care for one to five years followed by 29.67 percent for more than five years and the remaining 14.29 percent are providing for less than one year. The caregivers who are providing care to the elders for less than one year found it less stressful except in the case of one caregiver. Under this period, only one severely diseased elder was found and others have relatively fewer health problems although they have multiple age-related issues. Apart from that, the caregivers who are providing care from one to five years, those elderly have age-related issues, multiple ailments and four of them are severely diseased and faced various challenges. The caregivers who have been providing care for more than five years, especially to the elderly in severe health conditions are also facing the same difficulties and challenges. However, it is more challenging for the elder caregivers as they are also growing old with passing time.

A good number of caregivers i.e. 96.7 percent are providing care to only one elder, while 3.29 percent of caregivers take care of more than one elder each simultaneously. The caregivers who are providing care to more than one elderly stated that taking care of the elderly members is always very challenging and it is more challenging if the care receiver resides in a different household. In that context, one such female caregiver who was taking care of two elderly residing in two different households shared her experiences –

“Taking care of both my widow mother-in-law at home and my widowed father at my parental home at a time is tremendously challenging for me. It causes both physical as well as psychological stresses. After the death of my mother, my husband and I took over the caregiving responsibilities of both the houses, as I am the only child of my parents. Although we belong to a joint family most of the time my husband, sister-in-law, and brother-in-law remain outside the home for their job purposes. Hence, I am the sole caregiver for my two families. After completing all household tasks at my matrimonial home, I use to go to my paternal home to visit my widowed father every day.”

Categories of caregivers and their experiences

In this study, the caregivers can be categorized broadly as female and male caregivers. The female category constitutes the daughter-in-law, elderly women, married and unmarried daughters. Under the male category, married and unmarried sons, elderly male spouses were the caregivers.

Female care providers: Female caregivers play the multiple roles of daughter, wife, mother, and employee and it creates difficulties for women due to the pressure of enacting these conflicting roles. The female caregivers in the present study were daughters-in-law, elderly women, middle-aged women, married and unmarried daughters.

Experiences of daughter-in-law as a care provider

Care for older parents is traditionally available in the parental home as the son is expected to bring his wife into the family home upon marriage rather than departing to set up a new home (Lamb, 2013). For daughters-in-law, caring for parents-in-law meant sacrifices in the form of giving up a career, enduring separation from their husbands, and transitioning into caregiving roles – the costs that had to be borne to aid their husband's filial role. The limited sense of autonomy and freedom that these caregivers found in running the household would soon evaporate with the feeling of being left behind in an often unidirectional nature of caregiving. This led to perceptions of burden which would often find release through venting out anger and frustration (Ugargol & Bailey, 2018). One of the women from the

sandwich generation providing care to the mother-in-law has shared her experiences by stating that the care-providing task along with other household activities is very challenging for them, especially for the caregiver woman. The woman stated :

“My husband and I both work as daily wage earners but I perform most of the household activities such as taking care of our daughters, preparing food, and other household activities. After reaching home from work, I hardly can make out time for myself. Finally, I am forced to give up my job. It becomes very difficult for me now to meet the daily needs”

Another daughter-in-law narrated her experiences and stated,

“Taking care of a diseased elder is burdensome for the entire family. My mother-in-law is 95 years old has various age-related ailments and under bed-ridden conditions for 3 years. My husband remains outside the home for the whole day due to his job and our son remains busy with his studies hence, I am the single caregiver to all the members of our family. I can go nowhere as my mother-in-law keeps calling me now and then, which creates a noisy environment in the house. It also disturbs my son in his study time. Due to all these, sometimes I get much frustrated and irritated and wish it is better if my mother-in-law passes away.”

The greatest and saddest change that comes to the life of a woman may be the result of widowhood. Widows have to face problems of money, child-rearing, personal and social life. The widows who have to take responsibility on the shoulder of their sons and daughters along with their parents-in-law, live a life full of suffering. One of such widows stated,

“My husband expired just after 2 years of our marriage. Since then, I am the only caregiver to my daughter and father-in-law and sometimes it creates trouble and insecurity. The deteriorating health of my father-in-law and the growing age of my daughter sometimes makes me think of my upcoming life. After the death of my father-in-law, how will I manage my home being a widowed mother?”

A significant number of middle-aged female caregivers opined that they have to undergo financial constraints as many of them have no regular income source. Even if they earn, it is not sufficient to cater to their needs due to the number of dependents. Few caregivers stated that they ignore even their ailments to meet the demands of others. For some, loneliness is very common due to a lack of cooperation from other family members. With negligence and financial insecurity, few of them have also experienced verbal abuse. Most of the caregivers are suffering from mild health-related problems such as high blood pressure, diabetes, backache. A middle-aged woman stated,

“I have been suffering from backache since my son’s birth for last 5 years, but due to financial crises, I failed to take proper treatment and rest because I have to take care of my mother-in-law along with other multiple household responsibilities, and now the pain is becoming severe day by day. Yet after doing all these, getting verbal abuses in return has frustrated me”.

Midst of the financial crisis, non-cooperation of the family members, and failure to take the right decision at the right moment lead to tension in the family. Alcoholism is one of the reasons that destroy the environment in a family. On the one hand, an awful family environment and on the other multiple roles and financial constraints used to place some of the caregivers in a very wretched situation. A woman stated,

“At times I feel depressed and lonely because sometimes my husband comes home drunk, abuses me verbally, and creates an unpleasant environment at home for which, I wish to stay away from all these but my situations do not allow me. I have to do the entire household tasks from cleaning, cooking to bringing drinking water. So with growing age, it is becoming a great challenge for me to perform household works and provide care to my family members.”

As we know daughters-in-law being culturally expected to provide care to parents-in-law had to cope with the increased care demands. Due to patriarchal residence and husbands’ unavailability during the daytime, daughters-in-law were the only available caregivers and conformed to the role to meet cultural expectations.

Some of them managed careers, households, providing care to their older adults with little or no support from their family members. Apart from their culturally and gendered determined roles of child care and elder care, daughters-in-law became the de-facto men of the house and handled traditionally male-dominated roles of purchasing things for the household, paying utility bills, running outside errands including emergent needs in a household (Ugargol & Bailey, 2018).

Experiences of the elderly women as care providers

It is revealed from the narratives that all the elderly caregivers throughout their lives continuously provide care to their loved ones. Before marriage, they were providing possible care to their parental family members and later it transfers to their matrimonial family along with performing different roles i.e. wives, daughters-in-law, and mothers, and managing other household activities. It does not only create a role conflict situation but leads to role strain too. One of the elderly caregivers stated,

“Before entering into the marital life, I worked as a school teacher near my home. After marriage, it became difficult for me to continue my job as I had many roles and responsibilities. Moreover, my in-law’s family did not permit me to continue my job and I am suffering it now. Had I continued my job, I would have been economically independent by now. Sometimes it disturbs me a lot.”

54 years old woman, mother of three unmarried sons and two married daughters had been taking care of her husband and children since after her marriage and shared her experiences,

“Caregiving responsibility is not a new thing for me as I took care of my paternal family members before my marriage. My paternal family also belonged to a poor economic background and I got married at a very early age. Since then, I have been taking care of my matrimonial home. At first, to support my husband, I worked as a daily wage earner but when my sons grew up, they asked me to stop working outside the home. Now I am the single primary caregiver to all my family members. My sons and husband, all are daily wage earners and they are not interested in household work. I get up at about 4 a.m. every day

and prepare food for them, as they have to go out for their duties in the early morning. Apart from that, I have to look after my poultries as well along with other household chores. Like so, I have to manage my family every day and this is my daily work schedule.”

It reveals that the health condition of the elderly caregivers is becoming worse due to the over-burden of duties and multiple roles. Loneliness, financial constraints, and fear of death are common issues for elderly caregivers. Despite their increased age, along with taking care of spouse and grandchildren, they have to perform all household activities including agriculture and animal husbandry because those are their primary sources of income which they cannot ignore. They sometimes ignore their health conditions, as they are unable to manage time for self-care. Besides their loneliness, the elderly caregivers are also suffering from multiple ailments both mild and severe. The aged caregivers with severe ailments find troubles in their caregiving process. A substantial number of caregivers have financial problems and stated that their earnings are not sufficient for the fulfillment of their needs. Some of the caregivers experience negativity regarding decisions.

Experiences of daughters as care providers

Although it is expected that the sons are to take care of the elderly parents in their old age, many instances are there where the daughters play a very pivotal role as care-provider. For Indian daughters, traditional norms emphasize that once a daughter is married, she is no longer obligated to care for her parents as her obligations for caregiving are now transferred to her parents-in-law (Lamb, 2005; Gupta, *et al.*, 2009). However, daughters do assume responsibility for parent care when a son is not available such as due to emigration or when a parent is widowed (Pillai, *et al.*, 2012). One of the unmarried self-employed daughters aged above 55 years narrated her experience,

“I am the lone caregiver to my widow mother. My elder sister got married and my younger brother passed away. Although my widow sister-in-law and niece stay within the same household, they neither are concerned about my mother’s condition nor ask anything about our needs. Hence, I cannot leave my mother

alone at home and have to run my tailoring works from my house itself. Apart from that, I have to manage all other household activities on my own.”

At many times due to family responsibilities, girls have to remain unmarried. It is very common that when someone loses their parents at an early age, they have to take up the responsibilities of their younger siblings which compel them to remain unmarried. A woman aged 45 years who remained unmarried stated,

“Providing care to my father is a challenging task, but it becomes more challenging if the economic condition of the family is not sound. My father is paralyzed for years and my sister and I are the primary caregivers as well as the only bread earner of the family. We cultivate in our paddy field as well as of others for earning. Apart from that, we earn by selling our poultry and woven products also. Along with managing the financial needs, taking care of the deceased father is a challenging task for us as we too are getting old with our increasing age”.

Usually, in the case of the Indian daughters, it is seen that once the daughter gets married, her caregiving obligation also gets transferred from her biological parents to her parents-in-law (Lamb, 2005; Gupta, *et al.*, 2009). However, if there is no son or the son resides in another place, or a parent is a widow or widower, daughters do continue their responsibilities towards their biological parents (Pillai, *et al.*, 2012). The present study also unveiled such cases. A married daughter providing cares about her matrimonial and paternal homes shared her experiences regarding the role performed by her,

“I am the caregiver to my mother and my paternal uncle who is unmarried and differently able. My elder brother passed away just after my marriage leaving behind my mother and uncle. Therefore, I had to shift to my paternal home with my husband and children. My husband is the primary earner for both the matrimonial and paternal homes of mine and he stays in another place for sake of his job. Since there is no other source of income apart from my husband's job, it is more difficult to run two different homes with a single source of income. Moreover, besides providing care to my mother and uncle, I

have to perform lots more other household works including taking care of children and hence, my day-to-day activities are very much challenging and exhausting.”

A widow who had been providing care to her elderly widow mother for the last 7 years stated,

“Losing my husband created emptiness and sometimes insecurity in me. Although I face several challenges, still I am contributing the possible care towards my mother accepting it as commitment as well as ethical”. She receives the pension of her expired husband as well as works as a partial wage earner.

Male care provider

It is believed that although women are being culturally expected as care providers in a patriarchal society, a male is not an exception. Male caregivers are also playing multiple roles and have gone through similar kinds of frustration and anxiety. The married and unmarried sons and elderly male spouses use to play multiple roles.

Experiences of sons as care Providers: As like the daughters, the unmarried sons are also providing care to the elders along with managing their individual lives although facing different challenges. Two of them have left their jobs for sake of taking care of their parents. An unmarried male caregiver stated,

“Playing multiple roles by one person is difficult and it becomes more difficult when there is no alternative way left.” One of them stated, “Being a businessman and performing the role of son and brother simultaneously is not an easy task. It creates role conflict and role strain in certain situations.”

One of them stated-

“I am the lone caregiver to my mother as my brothers stay outside for their earnings. My frustrations are mounting day by day. My mother is suffering from cancer and will never be cured of it; I have left my job and trying to provide the best possible care at my convenience and do all the household activities together. I have left my job and started my own business. My mother is becoming less active with her increasing age and I can no longer

stay outside the home. I try to complete all my business-related works in the daytime itself every day.”

Another respondent stated,

“Though both my parents are paralyzed the caregiving responsibilities have been increasing more since last 7 years after my father got completely paralyzed? I have to take care of my parents as well as look after my business simultaneously. Therefore, I hardly can spend time for myself. I spend the night at my shop and come home in the early morning. Then I prepare breakfast, take my father to the toilet and make him take bath, wash his clothes, etc. After that, I go to my shop at around 7.30 am and return at 10.30 am to feed my father. Like so, I have to shuttle 4 times a day between my home and shop for all these household chores.... Sometimes I feel pity for myself for taking family responsibilities at such an early stage of my life and wish to take some time for myself out of my busy day-to-day household schedule. Caregiving is not an easy task but since I stay in a joint family and other family members join their hands, this kind of family structure is a big help for me”.

Experiences of elderly who rely on self-care

In the study, it was found that a good number of elderly couple have to live their life without having any care services. During different challenges, they are somehow able to manage their life with spousal care only. The main reasons for their helpless condition were mainly due to separation of their sons, the marriage of daughters, death of family members; childlessness, and family disputes:

Childlessness is a curse for many elderly couples as they revealed during the interview. The effects of childlessness they have experienced are distress, raised depression and anxiety levels, and feelings of insecurity. An elderly spouse of 79 years had been providing IADL care to her 87 years old husband for the last five years along with taking care of herself. The couple has no children and living in a poor economic condition where agriculture was the sole source of their income. Now because of their growing age, they are unable to perform any agricultural works and became dependent on fair-priced rice provided by the government and the earnings from their poultry

only. The elderly wife is the only caregiver to her husband, as due to age-related issues, the husband cannot help his wife in any household chores. She has also some physical ailments but since there is no other member in the family, she has to perform everything single-handedly and shared her experiences stating –

“I have to manage all household works on my own such as cleaning, cooking and looking after of my poultries and lots other works. I am suffering from various age-related health issues. My health becoming weaker with ages but there is no alternative way available for me and I am trying my best to take care of my husband as well as of me as far as possible.”

When she was asked how she was managing to bring household goods or in medical urgency, she replied,

“I try to do on my own as far as possible; however, my nephew who stays nearby sometimes comes to my help whenever he is asked. Taking care of my husband is my responsibility and I am taking it positively but I wonder what will happen if any one of us passes away, who will take care of the other person. Sometimes I feel very lonely because of our childless destiny and get feared to think about the rest of our lives.”

It is generally believed that sons take the responsibility of their parents in old age by following the traditional value of the filial obligation. It was found that despite good economic conditions the sons and relatives have neglected the elderly. Several cases have been identified in the present study in this regard. Although, even the elderly who were engaged in the organized sector have a regular pension and can meet their financial needs, due to the separation of the sons and daughters-in-law, have to face tremendous challenges in terms of care and support in old age. A couple (86 years old husband and 73 years old wife) had maintained their livelihood from pre-retirement savings. The wife used to perform the daily household activities along with taking IADL care of the husband. Her husband had to undergo a major brain operation four years before due to an accident. Since then, he is suffering from dementia. Apart from that, both the husband and wife are also facing other age-related issues. She stated,

“We have three children, two married daughters, and one married son and grandchildren as well. Son and daughter-in-law are staying with us but in a separate kitchen. Son is engaged in business and the daughter-in-law is the homemaker. However, neither the son nor the daughter-in-law takes care of us. We sacrificed a lot for our children but got nothing in return. Our son and daughter-in-law never asked about our problems, whether we have taken the meal, took medicine properly or not. However, my married daughter is taking care of us though she lives in a different place. I manage all the household activities along with taking care of my husband.”

In our society parents have a lot of expectations from their sons and consider them their support in old age which is well reflected in the above narrative. However, the married daughters used to play the role of emotional caregiver.

One of the elderly couple (75 years old husband and 67 years old wife) who were teachers by profession had one married daughter, one married son, and one grandson. They are somehow able to manage their life on mutual caregiving to each other. The husband is physically more active than his spouse as the wife is suffering from various physical ailments viz. diabetes; high blood pressure etc. and she underwent six different operations of gallbladder, uterus, spinal, and knee. The son is a businessperson, his wife is a temporary college teacher and they stay separately in a nearby area. When the couple was asked whether they are taken care of by their son and daughter-in-law, the elderly woman replied,

“Let alone taking care of us, they don’t even call us over the phone.” She shared one incident, “One day we both were ill and I asked my son to bring the medicine of diabetes and blood pressure for me but he did not. He even did not call me the next day, or asked about my health. I was severely ill that day. Later my ill husband brought the medicine for me.”

She further revealed that they are not receiving any form of care from their son; rather, their married daughter provides the care although she stays far away from them. They stated,

"The outlook of the younger generation towards their parents has changed a lot in the present-day context. Our son and daughter-in-law both are well educated and we expect their commitments towards us. However, it seems academic education did not educate them morally and mentally. Society and human beings are becoming more materialistic and individualistic."

Another elderly couple, (92 years old husband and 83 years old wife) relies on mutual caregiving. They have 3 married daughters and 4 married sons and grandchildren. Their one son permanently lives in his paternal uncle's home and the other three are living in the same household with the couple but with separate kitchens. The husband stated,

"We both take care of each other where I, (i.e. the husband) am the primary earner for our livelihood and the wife is the homemaker. Our sons and daughters-in-law are not concerned about our condition; however, our married daughters are distant caregivers. We never expected such a life we are spending now. I use to earn my livelihood by selling hand-made bamboo products in the nearby weekly market. Our married daughters also economically support us. With our increasing age, it becomes difficult for us to meet our daily needs.

The ADL type care providers have to face more challenges irrespective of their differences in socio-economic background. Similarly, the elderly couples who have their children but never get care and cooperation from their sons and daughters-in-law; stated that they are becoming too lonely. They never expected to be alone and their children would never look after them. Across India, the family remains the primary source of care for older adults and assumes a central place as the mode of old age security in India (Lamb, 2013). Family members are expected to act as primary caregivers to older adults and multi-generational co-residence with children and grandchildren is still widely prevalent in India (Gupta, *et al.*, 2009; Ugargol, and Bailey 2018). As in much of Asia, cultural values such as familism, filial piety, and family

cohesion come to the fore and influence caregiving roles and responsibilities for older adults in India (Kadoya & Khan, 2015; Pillai, *et al.*, 2012).

Challenges experienced by the caregivers

The narratives of different categories of caregivers reveal the fact that the caregivers have to face a lot of challenges in providing care to the elderly. After analyzing the narratives of different categories of caregivers, three major themes have been identified as major challenges experienced by the caregivers - Personal and familial issues resulting from the poor economic condition; overloaded with multiple roles; and gendered division of caregiving labor.

Poor economic condition and caregiving challenges

The challenges of the caregivers are categorized based on their age; one is below 60 years of age i.e. the middle-aged and the other one is 60-'80 +' categories. In the case of middle-aged caregivers, 49 caregivers opined that they faced financial problems, as many of them have no proper and certain source of income. Even if they earn, it is not sufficient to meet their financial needs because of the larger number of dependents. A few caregivers stated that they ignore even their ailments because of it. The 43 caregivers sometimes feel lonely due to the non-cooperation of

Table No: 3

Issues of Caregivers:

Sl. No	Problems Of Care Givers (Aged Below 60s)	Nos. Of The Respondents	Sl. No	Problems Of Care Givers(Aged Above 60-80)	Nos. Of The Respondents
1	Loneliness	43	1	Loneliness	34
2	Verbal Abuse	10	2	Verbal Abuse	04
3	Financial Problem	49	3	Financial Problem	29
4	Food Problem	07	4	Food Problem	13
5	Health-Related Problem	39	5	Health-Related Problem	34
6	Negativity Regarding Decisions	13	6	Negativity Regarding Decisions	15

Other family members, negligence and financial insecurity where 10 out of them experience verbal abuses from their family members. Total 39 numbers of caregivers are suffering from mild health-related problems such as high blood pressure, diabetes, backache. In case of negativity regarding decisions, some of the caregivers opined that their family members are not cooperative at all. Sometimes it creates trouble within the family as none of the family members give respect to other members' decisions. There are some other reasons as well, as the consumption of alcohol, which destroys the family environment.

In contrast, all the elder caregivers experience loneliness. According to them, the age-related issues and non-support of their children increase their loneliness day by day. Apart from their loneliness, the elderly caregivers are also suffering from multiple ailments both mild and severe. The aged caregivers with severe ailments find troubles in their caregiving process. 29 caregivers have financial problems and stated that their earning amount is not sufficient for the fulfillment of their needs which is the basic reason behind the lack of proper food and nutrition. The 15 caregivers experience negativity regarding decisions. According to them, with their increasing age, they lose their status in the family and the other family members do not consider their decisions. The 13 elderly caregivers also face the crises of proper food and nutrition, while 04 of the caregivers are verbally abused by their family members. The majority of the middle-aged caregiver families are fully dependent on agriculture with minimum areas of cultivated land which is not sufficient for their survival. Most of the caregivers have no specific earning source. Along with cultivation, they are dependent on informal sectors i.e. daily wage-earning, animal husbandry, etc. Only a few of them are engaged in their own business. Moreover, they also take loans from the SHGs for their urgent needs. Moreover, a few of the caregiver families are economically dependent upon the care recipient elders in terms of monthly pension.

Most of the elderly caregivers have no specific earning source and they depend on agriculture and animals husbandry. Only a few of them were service holders and now they are receiving a monthly

pension that is not sufficient for their expenses. Childless couples get partial economic support from their relatives sometimes. They manage their monthly expenses by selling their poultry and agricultural products. The married daughters with sound economic backgrounds provide the best possible economic support when the elderly need

Health systems in Assam often lack the specialized personnel and infrastructure to provide comprehensive care for elderly/ageing populations. Social support for elderly populations in such resource-constrained settings and family caregivers play a crucial role in that regard. However, family caregiving duties are often unremunerated and their care-related economic burden is often overlooked. The caregivers used to give 4 to 8 hours a day for elderly care. At that time, most of it was spent on personal care. All family caregivers in the sample spent 2000 to 15000 for caregiving to their care recipients within a month which is too expensive for a low-income household. For both males and females, family caregivers reported a high level of caregiving burden, but females reported a relatively higher level of burden than their male counterparts. Family caregivers in this study also indicated a high level of financial stress. Indeed, nearly two-thirds of the family caregivers in this study reported a worse state of financial well-being as a result of caregiving towards their elderly relatives. The majority of the family caregivers in this study reported dipping into savings, not being able to afford those little extras, and giving up necessities. Most of the caregivers in this study were primary caregivers who provided more than 20 hours of care per week. This could reduce participation in the labor market leading to a reduction in their monthly income and consequently increased financial stress. It was therefore not surprising that an overwhelming majority of the family caregivers in this study indicated that caring for their elderly relative was too expensive.

Caregivers Multiple Roles

It was found that irrespective of age and sex, all the caregivers have to perform multiple roles along with caregiving responsibilities not only to the elder but also to others. The daughters-in-law, married sons, unmarried daughters, married daughters, and spousal

caregivers including both elderly females and males are overburdened with multiple roles to perform. The role as a spouse, mother, daughter, daughter-in-law and son are the other primary role the caregivers played apart from the caregiver role. Besides, they had taken the responsibility of homemaking, agriculture, and animal husbandry. Along with multiple roles, they have to deal with economic challenges and increasing caregiving demands from the care receiver. At many times the caregivers are in role-conflict situations. Studies revealed that it results in adverse consequences such as physical and emotional problems, depression, fatigue, burnout, and feeling of resentment towards the patient (Campbell, *et al.*, 2008). Role conflicts take place when the caregiver itself makes conflicting and incompatible demands. Role-strain takes place when a caregiver becomes unable to meet the expectations and obligations of multiple roles. Performing multiple roles along with taking care of the elderly is hectic for any individual. Playing the role as a daughter, mother, wife, and daughter-in-law are challenging and it leads to role conflict. Yet after managing all the roles and responsibilities, receiving negative responses creates more disturbances. It was found that although the caregivers have to face some kind of challenges, the nature of challenges for working women and the women in the nuclear family is of a different kind.

Caregiving labour - gendered angle

In the prevailing gender regime in India, more wives are seen providing care to their older husbands, though adult sons are culturally expected to shoulder parent care responsibilities. In this context, the emigration of men further increases the care burden on women, especially spouses and daughters-in-law (Bongaarts & Zimmer, 2002). Women caregivers in India might additionally find the multiplicity of roles and gendered expectations as contributing to their burden (Prasad & Rani, 2007). On the other hand, caregiver burden is found to be linked to perceived reciprocity in the caregiver-care receiver relationship, and reciprocal support exchanges from the care receiver as well as support contributions from other family members have the potential to alleviate the perceived burden for the caregiver (Reid, *et al.*, 2005).

From the narratives of the older, it is well reflected that caregiving labor is gendered division. Many of the daughters-in-law caregivers have to leave their jobs for care-responsibilities in the household. Generally, the decisions are taken by the parents-in-law and husband. Caregivers delegated with multiple roles led to the perception of burden which often resulted in anger and frustration. Women caregivers wives and daughter-in-law adhered to gendered notions and cultural expectations in providing care to older adults (Ugargol & Bailey, 2018). Female spousal caregivers assume caregiving as a duty within the institution of marriage and gendered obligation means that they were expected to do so. Power and gender dynamics in the household enabled older adult males to obtain care either from their wives or from their daughter-in-law. Women caregivers, be it spouses, daughters-in-law, or daughters, had to abide by the decisions taken by older adult males and in some instances the mother-in-law. The mother-in-law often shared decision-making rights with her adult son. Lack of autonomy, curtailed freedom, and feelings of being dominated by their husbands are evident from narratives of female spousal caregivers (ibid). Female spousal caregivers described how they were barred from recourse to leisure and recreation such as watching television or communicating over the telephone, further heightening their perception of burden

Motivation for caregiving labor midst of challenges

Despite various challenges, caregivers render care services to the elders. The existing studies show the different reasons for caregiving to the elders, as caregiving is a choice, obligation, and respect to the loved ones. The study conducted by Ansari (2015) at rural Bihar on the caregivers revealed that they believe it is their commitment and by serving their elderly parents, they will earn *Punya*. There are some other reasons as well which compel the people to serve their elderly be it the tradition, institutionalized behavior, social conformity, and group pressures. Care should not be just an answer to a particular need; rather, it should be accepted as a fundamental part of humanity where the care providing practices are performed on morality and ethics and care should be

considered as an idealized form of people relating to each other (Bernhard, 2015). In the present study, a large number of the caregivers especially belonged to the middle-aged group viewed caregiving responsibility as ethical and a family commitment. One of them had stated,

“Providing care to the elders in presence of the younger generation creates an awareness of socialization among the younger with a hope of reciprocation in our upcoming days from them as we also have to go through that phase of life in our old days”. In case of the elder caregivers, they stated, “despite increasing age and decreasing physical strength, we still perform caregiving services for lack of other alternatives or because of commitment and affection towards the particular family members.”

Based on their views, it can be said that the traditional form of caregiving responsibilities is still prevalent in the study villages. However, an earlier form of community support is almost disappearing from society. One elderly person aged about 75 years stated,

“There is no proper and intimate bonding prevails unlike in earlier days. Society is changing now. In our childhood, we observed joint family was the ideal family to support the elderly, but gradually family is becoming nuclear. Earlier, members help each other and life was simple to compare to the present time. Now individuals are becoming more individualistic and materialistic. Those who are well educated are staying outside the community.”

One childless couple stated,

“Although we are not much connected to the society or community, we cannot state that we never receive any support from the community members. When we face any illness and need medical support, the community members especially the younger ones come out in our support providing a vehicle to and from the hospital and their physical assistance.”

From the statements of the elderly caregivers, it can be said that although the bonding between the community members is not as

strong as it was in the previous times, still it has its existence in the community members.

Conclusion

Caregiving is demanding and at the same time, it is an exhausting role to be played. Both the elderly as well as the caregivers are confronting different challenges and some caregivers are themselves in need of care. The family cares are available for the elderly in the study area where the female caregivers outnumber their male counterparts. They are providing possible care to the elderly members even after bearing the constraints in their own life. However, some elderly are still deprived of the minimum care from their family members. Some caregivers are providing care not willingly; rather there is a cultural and societal imposition on them which is noticed to be braking-down. Moreover, the caregivers mostly belong to the Baby-boomer generation who are going to be elderly themselves in near future. Hence, the caregiving task cannot be limited within the family setup. Therefore, the government, civil society organizations, and community members have to step in and work hand-in-hand for the well-being of both the elders and the respective caregivers. In addition, the caregivers should also be provided proper information, training, and all sorts of support to provide good care to their elderly relatives as well as to maintain their own well-being. We cannot expect a society where elderly people will become a burden without having any support from the family, community, and state at large.

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Active Ageing through Technologies: Well-being through the adoption of digital and non-digital health technologies among the Indian Elderly

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ABSTRACT

This study describes how digital and non-digital health technologies were utilized by 50 educated older people of both sexes (35 females and 15 males), residing in a metropolitan city Kolkata, in promoting their well-being. The qualitative in-depth interviews were conducted on these subjects. It was found that health was the priority of these participants, they adopted health-supporting technologies and passed through ordeals encountered by them in coping with new technological devices. Most of the participants wanted to explore new healthcare technologies only if the nature of technology is elderly-friendly, the product is relevant to them and the requisite knowledge about the exact functions is imparted to them through a supportive learning environment. Thus, these study findings are relevant for policy formulations towards a technologically inclusive society for the aged population.

Keywords: Older people, Health, Well-being, Digital technology, Non-digital technology

The rapid growth in the proportion of the aged population coupled with the rapid diffusion of technological innovations like Information communication Technology (ICT) has popularized the notion of e-health whereby an individual interacts with technologies like the Internet and mobile devices to seek health-related information, guidance, and health care support (Czaja, *et al.*, 2013).

Various cross-cultural studies across the globe including those carried out in India have identified a close association between older adults' physical health and the socio-economic and cultural aspects of their lives. Arnaert and Delesie (2007) conducted a study on home telecare intervention describing the nature of the relationship between care or support and health outcomes. Their study highlighted that the most aged, bereaved elderly living alone, and those having financial constraints but using health and social services have shown improvements in their levels of loneliness and health outcomes when video telephone intervention was used to connect to them with a network of relationships, where they felt accepted by sharing common interests and concerns. Through their quasi-experiment longitudinal study, Tsai and Tsai (2011) reported similar results about the effectiveness of the video-conference intervention in reducing depressive symptoms and improving health among the elderly residents of nursing homes.

Video conferencing, a computer-mediated communication, when used for medical purposes, provide a cost-effective and convenient way of delivering care, by enabling physicians or providers of care to counsel patients, constantly evaluate the health status of the frail, chronically ill, or those older patients lacking in mobility to frequently travel to health care practitioners for regular check-ups (Charness & Czaja, 2005; Tsai & Tsai, 2011; Sixsmith, *et al.*, 2013). Thus the e-health applications, telemedicine, "telecare", personal reminder information and social management systems, peer-led chat rooms/ online forums to discuss health and fitness-related topics with peers and health experts have assumed a pronounced role in creating possibilities for the aged to manage their health at home.

Since everyday technologies, those requiring least training or instruction, aid in executing routine tasks (Brophy, *et al.*, 2015), as well as basic activities of daily living (ADL) that include coping with physical needs, and Instrumental Activities of Daily Living (IADL) for handling complex activities like organizational skills management (Edemenkong, *et al.*, 2020), one crucial question that emerges with regards to the Indian elderly, is by what means it is possible to achieve technological inclusiveness among the heterogeneous old populace with varying perceptions, choices and socio-economic chances for consistent usage of varied forms of technologies. Moreover, the cost-effective digital services and products that are of interest to even health policymakers are often inaccessible to those elderly who need them the most due to the prevalence of the socio-economic digital divide (Sixsmith, 2013).

The glaring difference between the developed and the developing countries not only in terms of health care infrastructure but also access and consumption rate of technology make research along the same line in a developing country, like India, imperative to contribute to a holistic understanding in this regard. Also, the impact of life-enhancing technologies for healthy ageing on the everyday lives of older people is still under-researched. The relatively good health status of today's elderly is yet to intrigue researchers making it necessary to undertake a study on healthy and active older adults. Getting sufficient support and care within the family is preferred by the Indians and is a practical solution that can be achieved through telecare interventions to help the homebound older people remain active, lead an existence of independence and prevent institutionalization (Heide, *et al.*, 2012). Embracing a technology-enabled life holds the promise of well-being, especially among those feeling socially isolated. Well-being, in general, suggests positive physiological and psycho-social consequences like the nature of family connections, biological health, lower disability and death rate, volunteerism, and involvement in religious and recreational activities (Erickson & Johnson, 2011). Mitzner, *et al.* (2010) applied the term technology to incorporate all digital products or services.

This paper uses the term technology to include both digital and non-digital health-enhancing technologies and the ability to apply organized knowledge and skills in operating devices, procedures, and technical healthcare systems to improve the overall quality of life.

This study aimed to explore how digital and non-digital health technologies promote well-being among older people with a focus on the contexts under which they adopt new health-supporting technologies and identify the barriers that hinder the adoption of such technologies.

The study addressed these research questions: How does health technology enable the elderly to remain living independently at home rather than being institutionalized? Is the use of health technologies facilitating their daily life activities? How far can technological interventions alter vulnerability to disease and disability at old age? What role does social support play in helping them adopt the required skills of handling these technologies? The layers of discussion of this study objectively present the points of convergence and divergence of health technology adoption among the aged users and non-users within the selected homogenous group of elderly professionals.

Method

Sample

A total number of 50 men and women participants, aged 60 years and above, residing in Kolkata, a metropolitan city, were selected by 'snowballing sampling strategy. For the study, the aged participants with a professional background of working in the service sector as academicians, doctors, engineers, researchers, bankers, and government administrators were included in this study.

The socio-demographics of the participants indicate that most of them were married and were residing in home settings with their spouses. Thirty-five out of fifty participants were females, five out

of fifty participants were widowed and three of them lived alone. The majority reported having completed college or had graduate degrees, while ten out of fifty participants have higher degrees.

Information was collected through in-depth interviews after taking verbal consent from each participant. In-depth interviews were held in a combination of English and Bengali (the latter being the local language is generally spoken by the inhabitants of West Bengal, located in eastern India). Individually conducted in-home interviews spanned for an average duration of 1.5 hours each. A concise list of memory prompts or topics intended to be covered were included in the interview guide approach to assist/direct the progression of discussions with the participants. The inquiries included questions on the lived experiences of the elderly with health-specific technology to perform daily activities; coping strategies adopted by them to remain living independently at home; the kind of social support received and their awareness of the role of health-supporting technologies in maintaining good health. The interviews were audio-taped digitally and transcribed manually from Bengali to English keeping the quintessence of the narratives untarnished. Predominant topics were distinguished from the interviews through qualitative coding to compare the responses for an all-encompassing understanding of their daily experiences.

Keeping in mind the ethical approval required for the study, all communication exchanged with the participants was recorded (audio-taped).

Analysis of data

The first step of data analysis involved a careful examination of all the interview transcripts to decipher the overall information-laden in the collected data. To guarantee comparability, this step was succeeded by involving another analyst with experience in qualitative data analysis. Several readings of the collected data led to the formulation of an initial code list postreaching theoretical saturation. Braun & Clarke (2019b) have recommended

that achieving data saturation became a possibility if somewhat similar questions were posed to the research participants. In doing so, the analysts must proceed towards an inductive analysis for identifying themes and emergent patterns conceived through the interview data (Boyatzis, 1998, as cited in Vaportzis, *et al.*, 2017). Data summary themes were presented for a common topic where data collected was highlighted through theme titles (Braun & Clarke, 2021). The themes arising out of the research questions were then either expanded or contracted to rely upon the requirement for either including a wider variety of related topics or for getting more specific. On recognizing the categories underlying the initial code list, the data were selectively coded, evaluated consistently to refine and finalize the code with a list of themes.

Findings

Emergent Themes

A range of motivations for using health technologies was identified when talking to the users of technology who provided their responses under two different conditions- with a digital device and without any digital device. Interviews also reflected some of the hassles the users experienced and the concerns the non-users expressed about using technology. The themes that emerged from the study were: unraveling the history of physical activity; advantages and motivations of using technologies; disadvantages and barriers to using technologies and, issues regarding social support or training received to use healthcare technology. Each of the identified themes is illustrated with the help of the participants' quotes. Participants were indicated by P and assigned an appropriate number whenever quoted.

Unraveling the history of Physical Activity

In an attempt to identify their range of everyday activities and the extent of participation, the respondents were asked to elaborate on their physical performance of tasks; their involvement in instrumental activities of daily living, and participation in familial

and recreational activities. When asked about their earlier history of participation in sports or fitness programmes during their adolescent years only a few informed that they were engaged in such activities.

P5: "I was committed to studies and only allowed an hour to play in fields in the evening. Where was the time for formal sports?"

P17: "I never took an active interest in sports."

P28: "These days the gyms have made it easy. We had no such opportunity. Maybe only the rich could afford those. Whose knows?"

Interestingly, non-involvement in physical activities was not reported to affect their health as most were satisfied with their present health status and sedentary lifestyle. The majority of the young elderly aged 60-65 years reported they were in good health condition as they have not noticed any mention-worthy change in their functional status in terms of reflexes, speech, dexterity, reaction time, or ability to adapt to environmental changes. Some aged 70 years and above reported slight changes in vision, hearing, mobility, cognitive ability, reduced grip or walking speed, and joint pain.

P11: "I am quite healthy. Touchwood! Except for occasionally having joint pain as I had arthritis from a very young age, I am doing fine."

P36: "You can't stop these age-related changes. As long as I'm walking on my feet, working even after retirement, I don't have much to complain about."

It was interesting to note that, though many of the aged participants interviewed recognized the utility of incorporating health technology in daily fitness regimes, they believed it was the young people's way of health maintenance. Most of them still resorted to traditional methods of health maintenance like yoga, free-hand exercises, going for morning or evening walks and considered household chores like cooking, cleaning, washing,

escorting grandchildren to schools as physical activities. Apart from engaging in traditional recreational cognitive activities like reading, writing, solving crossword puzzles, a few hinted at the benefits of playing digital games in improving motor skills, even though they had not played any.

P23: 'Technology is a blessing. But do we need gym gadgets like treadmills and all that at home like those in the show biz to maintain health? Haven't our ancestors been keeping good health through yoga and meditation?'

P48: 'I am working post-retirement. I do household work before and after office which I think is physical activity. Going for walks a few days a week is the maximum I can make time for.'

P19: 'I once met with a severe accident and had to be on wheel-chair. It is very difficult to manage and get used to it, especially while taking the elevator. All of a sudden you feel everyone is staring at you because of it (wheel-chair).'

P27: 'I see my grandson playing computer games that need hand-eye coordination. I think it's a great exercise for the brain just like Sudoku. I wish they developed some easy brain exercise games for us (the seniors).'

Advantages and motivations of using health supporting technologies in everyday lives:

Participants though reportedly were in overall good health condition and without any major degenerative diseases, experienced various health issues as mentioned above. Hence they mentioned several perceived benefits and motivations for using various medical technologies daily for health assessment, healing, intervention, and health maintenance. The main motivation for using technology, especially the internet, is to seek health-related information, have quick and easy communication with health experts, and reduce dependence on caregivers.

Some of the participants have talked about using health-

supporting digital and non-digital technologies like blood pressure monitors, canes, walkers, activity trackers, wheelchairs, glucose meters, visual or hearing aids, grab bars in toilets, setting a reminder in phones to take medicines, and making use of telecare, messaging applications or video-conferencing with physicians if necessary. Apart from using social media to discuss various issues including health with friends, WhatsApp is the most favored mode of communication.

P2: 'I have this simple tool for hand exercise as I work for long hours on the computer. It improves my grip and relaxes my muscle. I have encouraged my wife and close friends to try such things.'

P31: 'Roomba (a vacuum cleaning robot) takes care of those tasks (cleaning) before I leave for work. I just need to set the alarm. My joint pain would otherwise make me depend on someone else to do the cleaning.'

P49: 'My daughter bought me a glucose meter. I often use it for quick assessment when I want to know if I need to visit the doctor. I also use an activity tracker, while walking, to count my steps. This tiny pocket-sized thing is amusing.'

P22: 'I make video calls to my family physician or WhatsApp him my test reports to save the time and energy of traveling to his chamber.'

P15: 'Home appliances eased the tasks and reduced physical labour making things faster. So I have more time to rest.'

P6: 'The pooling and sharing of helpline numbers for seniors have taken the edge off the stress and given people ideas on distant care for their folk.'

Participants, especially those having medical conditions like diabetes, compromised renal functionality, heart or respiratory diseases, arthritis, or restricted mobility, have talked about the usefulness of doorstep services of essential goods that are available at the click of a mouse.

P50: 'The online services delivering medicine help a lot. It

reduces my effort to stand in queues to buy medicine in bulk from shops that offer discounts.'

P44: 'They (online shopping sites) give discounts which is a bonus. You stay at home and buy stuff at a lesser price. That's somewhat exciting.'

Disadvantages and health barriers to using technologies:

Participants talked about several challenges they faced while using technologies due to their health issues. This was noted and illustrated as follows:

P30: 'After certain age health becomes an issue. I suffer from joint pain. Won't holding big smartphones or constantly swiping fingers across the screen expose me to a greater risk of arthritis?'

P4: 'I started using specs in school. The harsh light of smartphone screens hurt my eyes at night. So I don't use it in bed, I heard these days those (smart-phones) come in night mode. That might help people with eyesight problems like me.'

P43: 'With my hearing aids I could hear all sorts of sounds except for the ones I wanted to (hear). Such sharp noises created discomfort in my head. So I stopped using it. I don't care much if I hear less, which I think is manageable as long as I can participate in conversations.'

P16: 'It is difficult for me to read small fonts. So for official work, I prefer doing my tasks on laptops rather than typing on phones. But sitting at laptops for a long time gives me backache. These challenges are difficult to handle.'

Participants also mentioned some other perceived disadvantages and actual challenges faced while interacting with technologies. They mentioned issues like information being inaccurate, complicated, imprecise, and filled with jargon or instructions being too technical and devices being costly. Some expressed concern about the authenticity of health-related

information available online while others' responses indicated their lack of confidence and awareness about the availability of various health technologies.

P26: 'There is an information overload. We can't always be sure which are false and which aren't. It's better to get the facts verified from experts to avoid being misguided, especially when it comes to looking for health suggestions like a medicine dosage.'

P9: 'You have to see what the source of all these instructions is. Not all sites are authentic enough. Some of them maybe. I think it is also a cause for depression to go through these sites to know so many things can happen to you but it doesn't happen.'

P1: 'After a certain point of time it becomes difficult to follow or remember the steps. So the more the instructions are simple and 'non-technical, the easier it is.'

P42: 'I fear that if I press a wrong button and it (activity tracker) stops working I don't know how to fix it. These are the times I feel inadequate and miss my children.'

P21: 'Too much dependence on technology is not good. Sometimes, the devices give wrong readings. If you Google symptoms and take medicine, or rely on devices without asking your doctors, you are making yourself a guinea pig.'

Participants emphasized self-sufficiency and expressed their interest in investing time and effort to learn to use new cost-effective devices or technologies that either eased routine tasks or benefitted overall health.

P38: 'What are these health apps for? I have heard people download exercising apps but I don't know much about them. Don't they charge you for guidance? My experience has taught me if it's free, it's never good enough.'

P24: 'I pay for myself and buy what I feel is important or if the doctor suggests. I'm not ready to invest in something, say a treadmill, and use it to hang clothes. As they say, we should cut

our coat according to our cloth.'

P32: 'And again cost is a factor. I would not invest my hard-earned money on any fancy gadget or app, whatever it's called, and keep updating it now and then. We come from an era where we had to wait for our pencil to finish before getting a new one.'

Issues regarding social support or training received to use healthcare technology:

Participants have often talked about the importance of training or a supportive learning environment. However, immediate implementation of the knowledge acquired through training without follow-up support might be stressful.

P7: "I have become comparatively forgetful these days. I need to learn by heart or keep in practice the steps to avoid mistakes. Luckily in my case whenever I have asked for help in such matters, I didn't get any undignified responses from my children."

P20: "My son stays abroad. So I can't bother him every time I can't fix something. But his friend stays nearby. I call him up whenever I go somewhere and can't get out of the technical mess. Otherwise, it's really difficult."

P34: "My daughter told me that I have to be self-sufficient and learn to fix things on my own when I stumble. She says if I'm pampered I will never learn. It gets confusing at times to execute certain functions, especially on digital devices. Initially, I used to just switch it off. But she has told me that nowadays it is difficult to make a gadget dysfunctional. So I have started exploring more these days."

P8: "Training helps if you have not used a device or gadget in the past. Unlike the traditional ones like cane, walker, etc., the modern ones demand attention. I wish we had the scope of attending training or computer lessons to know how to get into it and be part of the modern world. But I guess it's never too late to learn."

Discussion

The findings of this study show how older people are adapting to the technological changes and identifying the role of digital and non-digital health technologies in enhancing their well-being. The main objective here was to present a comprehensive picture of the senior urban professionals' level of awareness, acceptance, and utilization of medical technological interventions in their everyday life from their viewpoints. However, due to the limited number of interviewees chosen for this qualitative study, the interpretations can only be regarded as suggestive while bringing out the realistic experiences of the participants.

Though the participants spoke frequently about their motivation behind the usage of the ICT to seek medical information and for health up-keeping, still most of them heavily rely on physician's advice given after face-to-face health check-ups. They prefer to get online information cross-checked for authenticity and opt for telemedicine, video-conferencing, and communicating through messaging or emails only on occasions of restricted mobility, long-distance travel, or busy schedule. This indicates their fear and concern about technology replacing humane touch in medical consultations. Also, face-to-face consultations give them a greater scope of meeting people in doctor's chambers, quenching their urge for social interaction.

Participants spoke about the necessity to ration screen-time and minimize heavy reliance on technology citing health reasons. This indicated that health is a priority for them as much as they need to balance time between online and offline activities. Though their cognitive decline sometimes makes it difficult to adopt technologies at a fast pace, participants suggesting changes in the product design to rectify difficulties such as declining eyesight or impaired auditory and motor skills negate the commonly held belief that older people are often reluctant to accept new technologies. They spoke at length about the availability of numerous options to choose from, even though not all of them had a clear idea about the exact functions and accessibility of various applications and medical devices. The nature of technology or the relevance of products is important to seniors. They reportedly had less interest in investing

in leisure and entertainment products available online and were keener to invest in essential health products that are not readily available in local stores. In other words, participants were willing to invest or re-invest (in case the technological device gets broken or lost) only in cost-effective products that they perceived as useful and not simply because they were accessible. This shows that for older adults to adopt or continue usage of a technology the perceived benefits and the costs involved outweigh other considerations. Also, improvement in one's functional state might render a product (eg. wheelchair) unnecessary once one comes out of the crisis (eg. fractured leg due to accident). Unfamiliarity with any specific technology can evoke feelings of anxiety. This makes the prior experience with a technology an important factor to consider as the seniors tend to avoid any technology with which they had a negative experience in the past. Technologies that draw unwanted attention to a disability (eg. use of hearing aid to correct auditory impairment) can result in feeling inadequate and stigmatized as "disabled" or "sick", leading to discontinuation in usage.

The findings of the study can be considered to fit the framework of diffusion theory that places importance on the interplay between the beliefs (about complexity), perceived usefulness of technology, and contextual characteristics (like economic and physical condition) of an individual in determining adoption of technology (Carpenter & Buday, 2007). Also, the fact that participants were concerned about the cost-effectiveness or affordability of technology and did not depend on family to buy it hints at the importance attached to self-sufficiency and self-dignity. Participants indicated that to adhere to a health technology it was important to receive training on usage and maintenance, besides disseminating clear instructions that are easy to follow and remember. Though language is not a barrier for most of the participants since they were educated professionals with basic knowledge in English, a language barrier in terms of technical jargon cannot be dismissed as a factor determining usage. The findings of the study are useful to supplement previous studies that identified the common barriers in technology used by the aged: differential

needs and abilities or low technology self-reliance (Czaja, *et al.*, 2013) feeling too old or lazy to learn due to lack of interest, inappropriately designed technologies, negative attitudes towards "youth" technologies, concerns over privacy issues, lack of confidence, limited knowledge due to absence of prior experience, financial constraint (Charness & Boot, 2009; Joyce, *et al.*, 2011; Tsai, *et al.*, 2017), inability to understand confusing technical issues or instructions (Vaportzis, *et al.*, 2017), space constraint in the houses, absence of social support or technical help and ergonomic impediments like too small-sized text font (Carpenter & Buday, 2007).

Conclusion

Based on present findings it may be concluded that it is important to generate a public message to make older people aware of the significance of exercising and leading an active lifestyle where fitness can be achieved through technological interventions. Spreading awareness among the elderly population via advertisements, broadcasting, online tutorials, lectures, and social media about the efficacy of technological tools for overall wellbeing is one way of doing it. Providing training and creating a supportive environment for them to learn new technologies is, on one hand, essential and, on the other hand, a daunting task. This is because the older adults in India still constitute the digitally marginalized section of society. Apart from actively engaging the older adults in the designing process, there is a need for support from companies and governing bodies to make health-beneficial technologies available at reasonable rates, especially for those who cannot afford them. Only this way can we ensure greater technological inclusiveness of this segment of the population in our present technology-oriented healthcare environment.

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